Computer algebra independent integration tests

5-Inverse-trig-functions/5.3-Inverse-tangent/5.3.4-u-a+b-arctan-c-x-^p

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July 22, 2021 Compiled on July 22, 2021 at 3:17am

Contents

Chapter 1

Introduction

This report gives the result of running the computer algebra independent integration problems. The listing of the problems are maintained by and can be downloaded from `https://rulebasedintegration.org`

The number of integrals in this report is [1301]. This is test number [150].

1.1 Listing of CAS systems tested

The following systems were tested at this time.

1. Mathematica 12.3 (64 bit) on windows 10.
2. Rubi 4.16.1 in Mathematica 12.1 on windows 10.
3. Maple 2021.1 (64 bit) on windows 10.
4. Maxima 5.44 on Linux. (via sagemath 9.3)
5. Fricas 1.3.7 on Linux (via sagemath 9.3)
6. Giac/Xcas 1.7 on Linux. (via sagemath 9.3)
7. Sympy 1.8 under Python 3.8.8 using Anaconda distribution on Ubuntu.
8. Mupad using Matlab 2021a with Symbolic Math Toolbox Version 8.7 under windows 10 (64 bit)

Maxima, Fricas and Giac/Xcas were called from inside SageMath. This was done using SageMath integrate command by changing the name of the algorithm to use the different CAS systems.

Sympy was called directly using Python.

1.2 Results

Important note: A number of problems in this test suite have no antiderivative in closed form. This means the antiderivative of these integrals can not be expressed in terms of elementary, special functions or `Hypergeometric2F1` functions. `RootSum` and `RootOf` are not allowed.

If a CAS returns the above integral unevaluated within the time limit, then the result is counted as passed and assigned an A grade.

However, if CAS times out, then it is assigned an F grade even if the integral is not integrable, as this implies CAS could not determine that the integral is not integrable in the time limit.

If a CAS returns an antiderivative to such an integral, it is assigned an A grade automatically and this special result is listed in the introduction section of each individual test report to make it easy to identify as this can be important result to investigate.

The results given in in the table below reflects the above.

System	solved	Failed
Rubi	% 100.00 (1301)	% 0.00 (0)
Mathematica	% 98.92 (1287)	% 1.08 (14)
Maple	% 92.24 (1200)	% 7.76 (101)
Maxima	% 31.98 (416)	% 68.02 (885)
Fricas	% 42.58 (554)	% 57.42 (747)
Sympy	% 42.51 (553)	% 57.49 (748)
Giac	% 28.06 (365)	% 71.94 (936)
Mupad	% 57.96 (754)	% 42.04 (547)

Table 1.1: Percentage solved for each CAS

The table below gives additional break down of the grading of quality of the antiderivatives generated by each CAS. The grading is given using the letters A,B,C and F with A being the best quality. The grading is accomplished by comparing the antiderivative generated with the optimal antiderivatives included in the test suite. The following table describes the meaning of these grades.

grade	description
A	Integral was solved and antiderivative is optimal in quality and leaf size.
B	Integral was solved and antiderivative is optimal in quality but leaf size is larger than twice the optimal antiderivatives leaf size.
C	Integral was solved and antiderivative is non-optimal in quality. This can be due to one or more of the following reasons 1. antiderivative contains a hypergeometric function and the optimal antiderivative does not. 2. antiderivative contains a special function and the optimal antiderivative does not. 3. antiderivative contains the imaginary unit and the optimal antiderivative does not.
F	Integral was not solved. Either the integral was returned unevaluated within the time limit, or it timed out, or CAS hanged or crashed or an exception was raised.

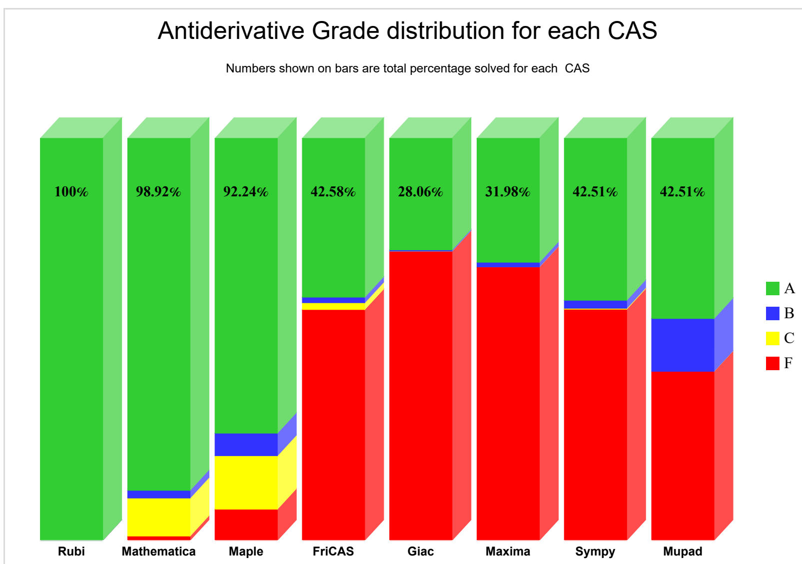
Table 1.2: Description of grading applied to integration result

Grading is implemented for all CAS systems. Based on the above, the following table summarizes the grading for this test suite.

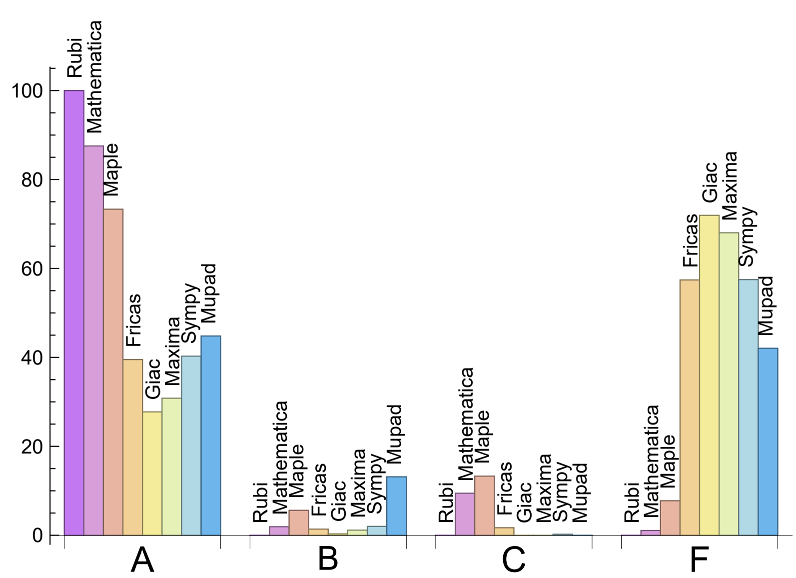
System	% A grade	% B grade	% C grade	% F grade
Rubi	100.00	0.00	0.00	0.00
Mathematica	87.55	1.92	9.45	1.08
Maple	73.33	5.61	13.30	7.76
Maxima	30.82	1.15	0.00	68.02
Fricas	39.51	1.38	1.69	57.42
Sympy	40.28	2.00	0.23	57.49
Giac	27.75	0.31	0.00	71.94
Mupad	44.81	13.14	0.00	42.04

Table 1.3: Antiderivative Grade distribution of each CAS

The following is a Bar chart illustration of the data in the above table.



The figure below compares the CAS systems for each grade level.



The following table shows the distribution of the different types of failure for each CAS. There are 3 types of reasons why it can fail. The first is when CAS returns back the input within the time limit, which means it could not solve it. This the typical normal failure **F** .

The second is due to time out. CAS could not solve the integral within the 3 minutes time limit which is assigned **F(-1)**.

The third is due to an exception generated. Assigned **F(-2)**. This most likely indicates an interface problem between sagemath and the CAS (applicable only to FriCAS, Maxima and Giac) or it could be an indication of an internal error in CAS. This type of error requires more investigations to determine the cause.

System	Number failed	Percentage normal failure	Percentage timeout failure	Percentage exception failure
Rubi	0	0.00 %	0.00 %	0.00 %
Mathematica	14	71.43 %	28.57 %	0.00 %
Maple	101	100.00 %	0.00 %	0.00 %
Maxima	885	39.10 %	8.93 %	51.98 %
Fricas	747	53.55 %	0.00 %	46.45 %
Sympy	748	62.57 %	36.23 %	1.20 %
Giac	936	44.23 %	35.68 %	20.09 %
Mupad	547	100.00 %	0.00 %	0.00 %

Table 1.4: Time and leaf size performance for each CAS

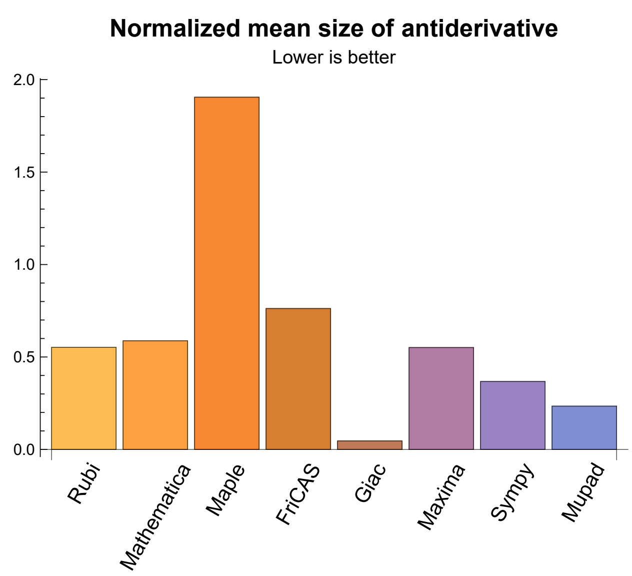
1.3 Performance

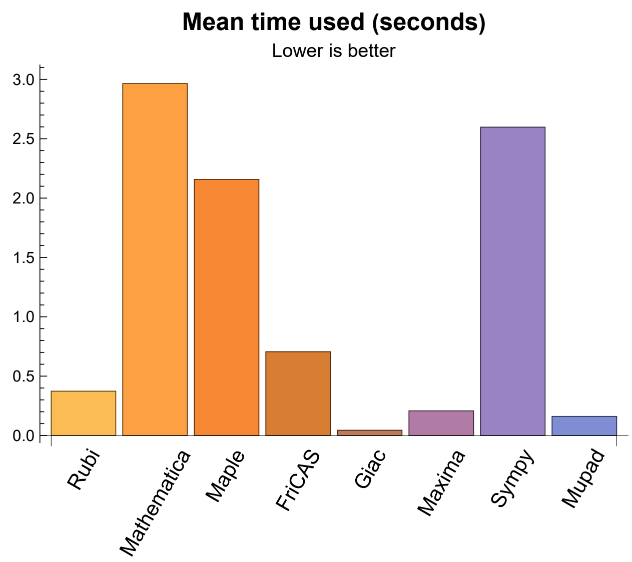
The table below summarizes the performance of each CAS system in terms of CPU time and leaf size of results.

System	Mean time (sec)	Mean size	Normalized mean	Median size	Normalized median
Rubi	0.37	136.61	0.55	69.00	1.00
Mathematica	2.97	153.41	0.59	57.00	0.58
Maple	2.16	470.42	1.90	30.00	0.59
Maxima	0.21	74.40	0.55	0.00	0.00
Fricas	0.71	107.54	0.76	0.00	0.00
Sympy	2.60	49.81	0.37	0.00	0.00
Giac	0.04	2.04	0.05	0.00	0.00
Mupad	0.16	33.25	0.23	-1.00	-0.03

Table 1.5: Time and leaf size performance for each CAS

The following are bar charts for the normalized leafsize and time used columns from the above table.





1.4 list of integrals that has no closed form antiderivative

{133, 148, 251, 252, 253, 254, 255, 256, 257, 355, 356, 357, 358, 359, 360, 361, 362, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 478, 479, 480, 481, 485, 486, 487, 488, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 512, 513, 514, 515, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 547, 548, 549, 550, 551, 555, 556, 557, 558, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 583, 584, 585, 586, 587, 588, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 623, 624, 625, 626, 627, 631, 632, 633, 634, 639, 640, 641, 642, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 662, 663, 664, 665, 666, 667, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 703, 704, 705, 706, 707, 708, 712, 713, 714, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 747, 748, 749, 750, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 779, 780, 781, 782, 783, 784, 788, 789, 790, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 826, 827, 828, 829, 830, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 860, 861, 862, 863, 864, 865, 869, 870, 871, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 906, 907, 908, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 929, 930, 931, 935, 936, 937, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 964, 965, 966, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 987, 988, 989, 990, 994, 995, 996, 997, 998, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1029, 1030, 1031, 1032, 1033, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1057, 1058, 1059, 1063, 1064, 1065, 1066, 1067, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1098, 1099, 1100, 1101, 1102, 1107, 1108, 1109, 1110, 1111, 1113, 1174, 1176, 1177, 1178, 1179, 1181, 1184, 1186, 1187, 1188, 1189, 1190, 1191, 1194, 1196, 1197, 1198, 1199, 1200, 1202, 1204, 1205, 1207, 1210, 1213, 1215, 1217, 1222, 1224, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1242, 1244, 1246, 1299}

1.5 list of integrals solved by CAS but has no known antiderivative

Rubi {}

Mathematica {}

Maple {}

Maxima {}

Fricas {}

Sympy {}

Giac {}

Mupad {}

1.6 list of integrals solved by CAS but failed verification

The following are integrals solved by CAS but the verification phase failed to verify the anti-derivative produced is correct. This does not mean necessarily that the anti-derivative is wrong, as additional methods of verification might be needed, or more time is needed (3 minutes time limit was used). These integrals are listed here to make it easier to do further investigation to determine why it was not possible to verify the result produced.

Rubi {}

Mathematica {15, 16, 25, 26, 27, 36, 37, 38, 39, 43, 44, 45, 47, 48, 49, 50, 51, 52, 57, 58, 59, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 99, 100, 101, 102, 103, 104, 105, 106, 108, 109, 110, 111, 112, 113, 116, 117, 119, 120, 121, 122, 127, 128, 130, 131, 132, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 155, 163, 171, 178, 180, 182, 184, 188, 190, 196, 198, 201, 203, 205, 206, 209, 211, 213, 214, 215, 217, 219, 221, 222, 223, 225, 227, 228, 230, 233, 236, 238, 241, 246, 259, 261, 263, 265, 267, 269, 270, 271, 272, 273, 275, 277, 278, 279, 280, 281, 282, 283, 284, 287, 288, 289, 290, 291, 295, 296, 297, 298, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 335, 336, 337, 338, 339, 340, 343, 344, 345, 346, 347, 348, 353, 354, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 392, 393, 394, 395, 396, 400, 401, 402, 403, 408, 409, 410, 411, 412, 413, 414, 415, 416, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 440, 441, 442, 443, 444, 445, 448, 449, 450, 451, 456, 457, 710, 711, 715, 716, 717, 718, 719, 745, 746, 751, 753, 754, 785, 791, 792, 793, 794, 824, 825, 831, 832, 833, 867, 872, 873, 874, 875, 876, 904, 909, 910, 911, 912, 932, 938, 939, 940, 941, 942, 962, 968, 969, 970, 992, 999, 1000, 1001, 1002, 1027, 1028, 1034, 1035, 1036, 1037, 1060, 1062, 1068, 1069, 1070, 1071, 1096, 1097, 1103, 1104, 1105, 1106, 1120, 1131, 1133, 1143, 1145, 1147, 1151, 1152, 1153, 1154, 1155, 1157, 1162, 1163, 1164, 1170, 1171, 1172, 1241, 1248, 1250, 1251, 1252, 1253, 1255, 1257, 1258, 1259, 1260, 1261, 1263, 1265, 1267, 1270, 1297, 1300, 1301}

Maple Verification phase not implemented yet.

Maxima Verification phase not implemented yet.

Fricas Verification phase not implemented yet.

Sympy Verification phase not implemented yet.

Giac Verification phase not implemented yet.

Mupad Verification phase not implemented yet.

1.7 Timing

The command `AboluteTiming[]` was used in Mathematica to obtain the elapsed time for each integrate call. In Maple, the command `Usage` was used as in the following example

```
cpu_time := Usage(assign ('result_of _int',int(expr,x)),output='realtime'
```

For all other CAS systems, the elapsed time to complete each integral was found by taking the difference between the time after the call has completed from the time before the call was made. This was done using Python's `time.time()` call.

All elapsed times shown are in seconds. A time limit of 3 minutes was used for each integral. If the integrate command did not complete within this time limit, the integral was aborted and considered to have failed and assigned an F grade. The time used by failed integrals due to time out is not counted in the final statistics.

1.8 Verification

A verification phase was applied on the result of integration for Rubi and Mathematica. Future version of this report will implement verification for the other CAS systems. For the integrals whose result was not run through a verification phase, it is assumed that the antiderivative produced was correct.

Verification phase has 3 minutes time out. An integral whose result was not verified could still be correct. Further investigation is needed on those integrals which failed verifications. Such integrals are marked in the summary table below and also in each integral separate section so they are easy to identify and locate.

1.9 Important notes about some of the results

1.9.1 Important note about Maxima results

Since these integrals are run in a batch mode, using an automated script, and by using sagemath (SageMath uses Maxima), then any integral where Maxima needs an interactive response from the user to answer a question during evaluation of the integral in order to complete the integration, will fail and is counted as failed.

The exception raised is `ValueError`. Therefore Maxima result below is lower than what could result if Maxima was run directly and each question Maxima asks was answered correctly.

The percentage of such failures were not counted for each test file, but for an example, for the Timofeev test file, there were about 14 such integrals out of total 705, or about 2 percent. This pecrentage can be higher or lower depending on the specific input test file.

Such integrals can be indentified by looking at the output of the integration in each section for Maxima. The exception message will indicate of the error is due to the interactive question being asked or not.

Maxima integrate was run using SageMath with the following settings set by default

```
'besselexpand : true'
'display2d : false'
'domain : complex'
'keepfloat : true'
'load(to_poly_solve)'
'load(simplify_sum)'
'load(abs_integrate)' 'load(diag)'
```

SageMath loading of Maxima `abs_integrate` was found to cause some problem. So the following code was added to disable this effect.

```
from sage.interfaces.maxima_lib import maxima_lib
maxima_lib.set('extra_definite_integration_methods', '[]')
maxima_lib.set('extra_integration_methods', '[]')
```

See https://ask.sagemath.org/question/43088/integrate-results-that-are-different-from-using-maxima/ for reference.

1.9.2 Important note about FriCAS and Giac/XCAS results

There are Few integrals which failed due to SageMath not able to translate the result back to SageMath syntax and not because these CAS system were not able to do the integrations.

These will fail With error `Exception raised: NotImplementedError`

The number of such cases seems to be very small. About 1 or 2 percent of all integrals.

Hopefully the next version of SageMath will have complete translation of FriCAS and XCAS syntax and I will re-run all the tests again when this happens.

1.9.3 Important note about finding leaf size of antiderivative

For Mathematica, Rubi and Maple, the buildin system function `LeafSize` is used to find the leaf size of each antiderivative.

The other CAS systems (SageMath and Sympy) do not have special buildin function for this purpose at this time. Therefore the leaf size for Fricas and Sympy and Giac antiderivatives is determined using the following function, thanks to user `slelievre` at https://ask.sagemath.org/question/57123/could-we-have-a-leaf_count-function-in-base-sagemath/

```
def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)
```

For Sympy, which is called directly from Python, the following code is used to obtain the leafsize of its result

```
try:
  # 1.7 is a fudge factor since it is low side from actual leaf count
  leafCount = round(1.7*count_ops(anti))

  except Exception as ee:
         leafCount =1
```

1.9.4 Important note about Mupad results

Matlab's symbolic toolbox does not have a leaf count function to measure the size of the antiderivative, Maple was used to determine the leaf size of Mupad output by post processing.

Currently no grading of the antiderivative for Mupad is implemented. If it can integrate the problem, it was assigned a B grade automatically as a placeholder. In the future, when grading function is implemented for Mupad, the tests will be rerun again.

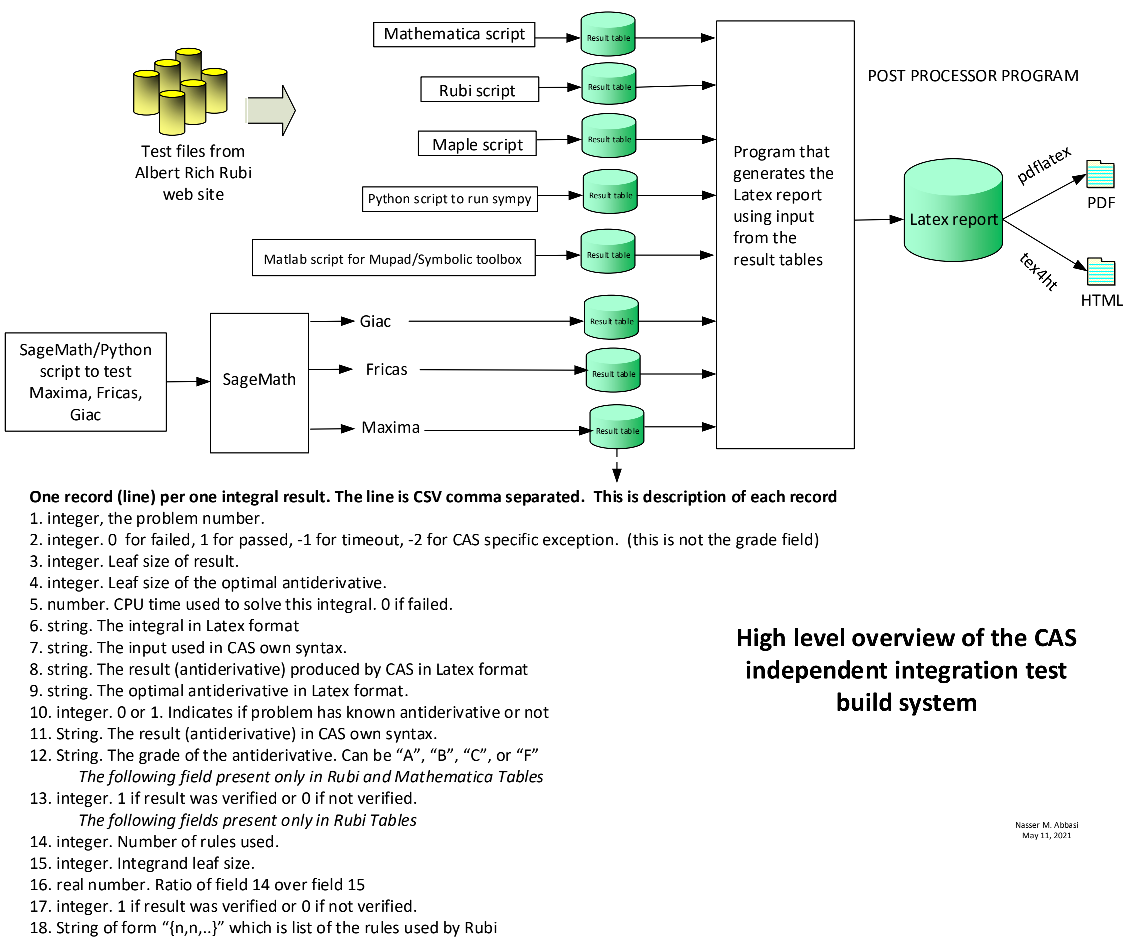
The following is an example of using Matlab's symbolic toolbox (Mupad) to solve an integral

```
integrand = evalin(symengine,'cos(x)*sin(x)')
the_variable = evalin(symengine,'x')
anti = int(integrand,the_variable)
```

Which gives `sin(x)^2/2`

1.10 Design of the test system

The following diagram gives a high level view of the current test build system.



Chapter 2

detailed summary tables of results

2.1 List of integrals sorted by grade for each CAS

2.1.1 Rubi

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301 }

B grade: { }

C grade: { }

F grade: { }

2.1.2 Mathematica

A grade: { 1, 2, 3, 4, 5, 6, 10, 11, 12, 13, 14, 15, 20, 21, 22, 23, 24, 25, 26, 31, 32, 33, 34, 35, 36, 37, 38, 43, 44, 45, 46, 47, 48, 51, 52, 53, 54, 55, 56, 58, 59, 60, 61, 62, 63, 64, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 131, 132, 133, 134, 135, 136, 137, 138, 139, 147, 148, 149, 150, 151, 152, 153, 154, 156, 157, 158, 159, 160, 161, 162, 164, 165, 166, 167, 168, 169, 170, 172, 173, 174, 175, 176, 177, 178, 179, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 324, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 414, 415, 416, 417, 418, 419, 420, 422, 424, 425, 426, 427, 428, 430, 432, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 712, 713, 714, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 747, 748, 749, 750, 752, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 786, 787, 788, 789, 790, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 826, 827, 828, 829, 830, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 868, 869, 870, 871, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 905, 906, 907, 908, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 933, 934, 935, 936, 937, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 963, 964, 965, 966, 967, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 993, 994, 995, 996, 997, 998, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1029, 1030, 1031, 1032, 1033, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1061, 1063, 1064, 1065, 1066, 1067, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1098, 1099, 1100, 1101, 1102, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1121, 1123, 1125, 1126, 1127, 1128, 1129, 1130, 1132, 1134, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1144, 1146, 1148, 1150, 1151, 1152, 1153, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1174, 1176, 1177, 1178, 1179, 1181, 1184, 1186, 1187, 1188, 1189, 1190, 1191, 1194, 1196, 1197, 1198, 1199, 1200, 1202, 1204, 1205, 1207, 1210, 1213, 1215, 1217, 1222, 1224, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1244, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1270, 1275, 1276, 1277, 1278, 1279, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1292, 1293, 1294, 1295, 1296, 1299, 1300 }

B grade: { 130, 141, 142, 143, 144, 145, 146, 217, 287, 323, 325, 392, 413, 421, 423, 429, 431, 433, 1261, 1263, 1265, 1267, 1297, 1298, 1301 }

C grade: { 7, 8, 9, 16, 17, 18, 19, 27, 28, 29, 30, 39, 40, 41, 42, 49, 50, 57, 65, 140, 155, 163, 171, 180, 710, 711, 715, 716, 717, 718, 745, 746, 751, 753, 785, 791, 792, 793, 794, 824, 825, 831, 832, 833, 867, 872, 873, 874, 875, 904, 909, 910, 911, 932, 938, 939, 940, 941, 942, 962, 968, 969, 970, 992, 999, 1000, 1001, 1002, 1027, 1028, 1034, 1035, 1036, 1037, 1060, 1062, 1068, 1069, 1070, 1071, 1096, 1097, 1103, 1104, 1105, 1106, 1120, 1122, 1124, 1131, 1133, 1135, 1143, 1145, 1147, 1149, 1154, 1173, 1175, 1180, 1182, 1183, 1185, 1192, 1193, 1195, 1201, 1203, 1206, 1208, 1209, 1211, 1212, 1214, 1216, 1218, 1219, 1220, 1221, 1223, 1225, 1226, 1227 }

F grade: { 509, 1243, 1245, 1262, 1264, 1266, 1268, 1269, 1271, 1272, 1273, 1274, 1280, 1291 }

2.1.3 Maple

A grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 29, 30, 31, 32, 33, 35, 36, 37, 38, 39, 41, 42, 51, 54, 55, 56, 57, 58, 59, 61, 62, 63, 64, 65, 66, 76, 84, 94, 133, 134, 135, 136, 137, 138, 139, 140, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 175, 177, 179, 181, 182, 183, 185, 186, 187, 189, 191, 192, 193, 194, 195, 197, 199, 201, 203, 204, 205, 206, 209, 211, 212, 213, 214, 215, 217, 219, 220, 221, 222, 223, 225, 227, 228, 230, 233, 236, 238, 241, 246, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 266, 267, 268, 269, 271, 273, 274, 275, 276, 277, 279, 281, 282, 286, 292, 293, 294, 299, 300, 301, 302, 304, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 335, 336, 337, 338, 339, 343, 344, 345, 346, 347, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 365, 367, 371, 373, 375, 377, 379, 381, 383, 385, 388, 391, 397, 398, 399, 404, 405, 406, 407, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 440, 441, 442, 443, 448, 449, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 512, 513, 514, 515, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 583, 584, 585, 586, 587, 588, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 662, 663, 664, 665, 666, 667, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 747, 748, 749, 750, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 826, 827, 828, 829, 830, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 906, 907, 908, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 964, 965, 966, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1029, 1030, 1031, 1032, 1033, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1098, 1099, 1100, 1101, 1102, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1159, 1167, 1174, 1176, 1177, 1178, 1179, 1181, 1184, 1186, 1187, 1188, 1189, 1190, 1191, 1194, 1196, 1197, 1198, 1199, 1200, 1202, 1204, 1205, 1207, 1210, 1213, 1215, 1217, 1222, 1224, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1242, 1244, 1246, 1247, 1249, 1254, 1256, 1290, 1299 }

B grade: { 28, 34, 40, 43, 44, 45, 46, 47, 48, 49, 50, 52, 53, 60, 67, 68, 69, 70, 71, 74, 75, 77, 78, 79, 83, 85, 86, 87, 92, 93, 107, 114, 115, 118, 119, 124, 125, 126, 174, 176, 178, 180, 184, 188, 190, 196, 198, 261, 263, 265, 284, 288, 290, 296, 298, 369, 394, 402, 410, 1156, 1162, 1163, 1166, 1170, 1171, 1248, 1250, 1252, 1255, 1257, 1259, 1264, 1270 }

C grade: { 72, 73, 80, 81, 82, 88, 89, 90, 91, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 108, 109, 110, 111, 112, 113, 116, 117, 120, 121, 122, 123, 127, 128, 129, 130, 131, 132, 141, 142, 143, 144, 145, 146, 147, 200, 202, 207, 208, 210, 216, 218, 224, 226, 229, 231, 232, 234, 235, 237, 239, 240, 242, 243, 244, 245, 247, 248, 249, 250, 262, 264, 270, 272, 278, 280, 283, 285, 287, 289, 291, 295, 297, 303, 305, 341, 342, 349, 350, 351, 352, 364, 366, 368, 370, 372, 374, 376, 378, 380, 382, 384, 386, 387, 389, 390, 392, 393, 395, 396, 400, 401, 403, 408, 409, 411, 446, 447, 452, 453, 454, 455, 510, 511, 516, 517, 518, 519, 581, 582, 589, 590, 591, 592, 660, 661, 668, 669, 670, 671, 1151, 1152, 1153, 1154, 1155, 1157, 1158, 1160, 1161, 1164, 1165, 1168, 1169, 1172, 1251, 1253, 1258, 1260, 1269, 1271, 1275, 1276, 1277, 1278, 1279, 1280, 1286, 1287, 1288, 1289, 1291, 1297 }

F grade: { 334, 340, 348, 438, 439, 444, 445, 450, 451, 643, 745, 746, 751, 752, 753, 754, 824, 825, 831, 832, 833, 834, 904, 905, 909, 910, 911, 912, 962, 963, 967, 968, 969, 970, 1027, 1028, 1034, 1035, 1036, 1037, 1096, 1097, 1103, 1104, 1105, 1106, 1173, 1175, 1180, 1182, 1183, 1185, 1192, 1193, 1195, 1201, 1203, 1206, 1208, 1209, 1211, 1212, 1214, 1216, 1218, 1219, 1220, 1221, 1223, 1225, 1226, 1227, 1228, 1229, 1230, 1241, 1243, 1245, 1261, 1262, 1263, 1265, 1266, 1267, 1268, 1272, 1273, 1274, 1281, 1282, 1283, 1284, 1285, 1292, 1293, 1294, 1295, 1296, 1298, 1300, 1301 }

2.1.4 Maxima

A grade: { 1, 2, 3, 4, 7, 8, 9, 10, 11, 12, 14, 17, 18, 19, 20, 21, 22, 24, 25, 29, 30, 31, 35, 36, 37, 42, 58, 59, 60, 61, 62, 66, 114, 115, 118, 125, 126, 133, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 175, 177, 179, 181, 183, 185, 186, 187, 189, 191, 192, 193, 194, 195, 197, 199, 200, 207, 208, 216, 224, 226, 229, 231, 234, 235, 242, 243, 244, 245, 251, 252, 253, 254, 255, 256, 257, 258, 260, 266, 268, 274, 276, 286, 292, 293, 294, 299, 300, 301, 302, 341, 342, 350, 352, 355, 356, 357, 358, 359, 360, 361, 362, 391, 397, 398, 399, 404, 405, 406, 407, 446, 447, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 485, 486, 487, 488, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 512, 513, 514, 515, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 555, 556, 557, 558, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 583, 584, 585, 586, 587, 588, 593, 594, 595, 596, 597, 601, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 631, 632, 633, 634, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 662, 663, 664, 665, 666, 667, 672, 673, 677, 678, 679, 680, 681, 682, 683, 684, 685, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1148, 1149, 1150, 1159, 1166, 1167, 1177, 1178, 1179, 1181, 1189, 1191, 1204, 1205, 1207, 1213, 1215, 1222, 1224, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1242, 1244, 1246, 1247, 1249, 1254, 1256, 1275, 1276, 1277, 1278, 1279, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1299 }

B grade: { 13, 23, 28, 32, 33, 34, 40, 41, 63, 64, 65, 67, 202, 210, 218 }

C grade: { }

F grade: { 5, 6, 15, 16, 26, 27, 38, 39, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 116, 117, 119, 120, 121, 122, 123, 124, 127, 128, 129, 130, 131, 132, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 174, 176, 178, 180, 182, 184, 188, 190, 196, 198, 201, 203, 204, 205, 206, 209, 211, 212, 213, 214, 215, 217, 219, 220, 221, 222, 223, 225, 227, 228, 230, 232, 233, 236, 237, 238, 239, 240, 241, 246, 247, 248, 249, 250, 259, 261, 262, 263, 264, 265, 267, 269, 270, 271, 272, 273, 275, 277, 278, 279, 280, 281, 282, 283, 284, 285, 287, 288, 289, 290, 291, 295, 296, 297, 298, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 343, 344, 345, 346, 347, 348, 349, 351, 353, 354, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 392, 393, 394, 395, 396, 400, 401, 402, 403, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 482, 483, 484, 489, 490, 491, 492, 493, 510, 511, 516, 517, 518, 519, 552, 553, 554, 559, 560, 561, 562, 581, 582, 589, 590, 591, 592, 598, 599, 600, 602, 603, 628, 629, 630, 635, 636, 637, 638, 660, 661, 668, 669, 670, 671, 674, 675, 676, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1120, 1133, 1147, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1160, 1161, 1162, 1163, 1164, 1165, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1180, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1190, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1206, 1208, 1209, 1210, 1211, 1212, 1214, 1216, 1217, 1218, 1219, 1220, 1221, 1223, 1225, 1226, 1227, 1228, 1229, 1230, 1241, 1243, 1245, 1248, 1250, 1251, 1252, 1253, 1255, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1280, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1300, 1301 }

2.1.5 FriCAS

A grade: { 1, 2, 3, 7, 8, 9, 10, 11, 12, 13, 17, 18, 19, 20, 21, 22, 23, 29, 30, 31, 32, 33, 34, 41, 42, 47, 54, 61, 62, 66, 67, 107, 114, 115, 118, 124, 125, 126, 133, 148, 149, 150, 151, 152, 154, 156, 157, 158, 159, 160, 162, 164, 165, 166, 167, 168, 170, 172, 173, 175, 177, 179, 181, 183, 185, 186, 187, 189, 191, 192, 193, 194, 195, 197, 199, 200, 202, 207, 208, 210, 216, 218, 224, 226, 229, 231, 232, 234, 235, 237, 239, 240, 242, 243, 244, 245, 247, 251, 252, 253, 254, 255, 256, 257, 258, 260, 266, 268, 274, 276, 286, 292, 293, 294, 299, 300, 301, 302, 341, 342, 349, 350, 351, 352, 355, 356, 357, 358, 359, 360, 361, 362, 391, 397, 398, 399, 404, 405, 406, 407, 446, 447, 452, 453, 454, 455, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 485, 486, 487, 488, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 512, 513, 514, 515, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 555, 556, 557, 558, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 583, 584, 585, 586, 587, 588, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 631, 632, 633, 634, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 662, 663, 664, 665, 666, 667, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 690, 694, 698, 702, 707, 713, 721, 725, 729, 733, 742, 749, 756, 762, 768, 774, 778, 783, 789, 797, 802, 807, 812, 821, 828, 837, 843, 849, 855, 859, 864, 870, 878, 883, 888, 893, 902, 907, 914, 918, 922, 926, 928, 930, 936, 944, 948, 952, 956, 960, 965, 972, 976, 980, 984, 986, 988, 998, 1007, 1011, 1015, 1019, 1024, 1033, 1042, 1046, 1050, 1054, 1056, 1058, 1067, 1076, 1080, 1084, 1088, 1093, 1102, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1119, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1130, 1132, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1142, 1144, 1146, 1148, 1149, 1150, 1159, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1210, 1213, 1215, 1217, 1222, 1224, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1242, 1244, 1246, 1247, 1249, 1254, 1256, 1275, 1276, 1277, 1278, 1279, 1286, 1287, 1288, 1289, 1290, 1299 }

B grade: { 4, 28, 40, 1166, 1167, 1209, 1211, 1212, 1214, 1216, 1218, 1219, 1220, 1221, 1223, 1225, 1226, 1227 }

C grade: { 482, 483, 484, 489, 490, 491, 492, 493, 552, 553, 554, 559, 560, 561, 562, 628, 629, 630, 635, 636, 637, 638 }

F grade: { 5, 6, 14, 15, 16, 24, 25, 26, 27, 35, 36, 37, 38, 39, 43, 44, 45, 46, 48, 49, 50, 51, 52, 53, 55, 56, 57, 58, 59, 60, 63, 64, 65, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 108, 109, 110, 111, 112, 113, 116, 117, 119, 120, 121, 122, 123, 127, 128, 129, 130, 131, 132, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 153, 155, 161, 163, 169, 171, 174, 176, 178, 180, 182, 184, 188, 190, 196, 198, 201, 203, 204, 205, 206, 209, 211, 212, 213, 214, 215, 217, 219, 220, 221, 222, 223, 225, 227, 228, 230, 233, 236, 238, 241, 246, 248, 249, 250, 259, 261, 262, 263, 264, 265, 267, 269, 270, 271, 272, 273, 275, 277, 278, 279, 280, 281, 282, 283, 284, 285, 287, 288, 289, 290, 291, 295, 296, 297, 298, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 343, 344, 345, 346, 347, 348, 353, 354, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 392, 393, 394, 395, 396, 400, 401, 402, 403, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 448, 449, 450, 451, 456, 457, 510, 511, 516, 517, 518, 519, 581, 582, 589, 590, 591, 592, 660, 661, 668, 669, 670, 671, 687, 688, 689, 691, 692, 693, 695, 696, 697, 699, 700, 701, 703, 704, 705, 706, 708, 709, 710, 711, 712, 714, 715, 716, 717, 718, 719, 720, 722, 723, 724, 726, 727, 728, 730, 731, 732, 734, 735, 736, 737, 738, 739, 740, 741, 743, 744, 745, 746, 747, 748, 750, 751, 752, 753, 754, 755, 757, 758, 759, 760, 761, 763, 764, 765, 766, 767, 769, 770, 771, 772, 773, 775, 776, 777, 779, 780, 781, 782, 784, 785, 786, 787, 788, 790, 791, 792, 793, 794, 795, 796, 798, 799, 800, 801, 803, 804, 805, 806, 808, 809, 810, 811, 813, 814, 815, 816, 817, 818, 819, 820, 822, 823, 824, 825, 826, 827, 829, 830, 831, 832, 833, 834, 835, 836, 838, 839, 840, 841, 842, 844, 845, 846, 847, 848, 850, 851, 852, 853, 854, 856, 857, 858, 860, 861, 862, 863, 865, 866, 867, 868, 869, 871, 872, 873, 874, 875, 876, 877, 879, 880, 881, 882, 884, 885, 886, 887, 889, 890, 891, 892, 894, 895, 896, 897, 898, 899, 900, 901, 903, 904, 905, 906, 908, 909, 910, 911, 912, 913, 915, 916, 917, 919, 920, 921, 923, 924, 925, 927, 929, 931, 932, 933, 934, 935, 937, 938, 939, 940, 941, 942, 943, 945, 946, 947, 949, 950, 951, 953, 954, 955, 957, 958, 959, 961, 962, 963, 964, 966, 967, 968, 969, 970, 971, 973, 974, 975, 977, 978, 979, 981, 982, 983, 985, 987, 989, 990, 991, 992, 993, 994, 995, 996, 997, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1008, 1009, 1010, 1012, 1013, 1014, 1016, 1017, 1018, 1020, 1021, 1022, 1023, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1043, 1044, 1045, 1047, 1048, 1049, 1051, 1052, 1053, 1055, 1057, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1077, 1078, 1079, 1081, 1082, 1083, 1085, 1086, 1087, 1089, 1090, 1091, 1092, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1118, 1120, 1129, 1131, 1133, 1141, 1143, 1145, 1147, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1160, 1161, 1162, 1163, 1164, 1165, 1168, 1169, 1170, 1171, 1172, 1228, 1229, 1230, 1241, 1243, 1245, 1248, 1250, 1251, 1252, 1253, 1255, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1280, 1281, 1282, 1283, 1284, 1285, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1300, 1301 }

2.1.6 Sympy

A grade: { 1, 2, 3, 8, 9, 10, 11, 12, 18, 19, 20, 21, 30, 31, 32, 133, 148, 149, 150, 151, 152, 154, 156, 157, 158, 159, 160, 162, 164, 165, 166, 167, 168, 170, 172, 173, 175, 177, 179, 181, 183, 186, 192, 194, 251, 252, 255, 256, 257, 258, 260, 266, 268, 274, 276, 355, 356, 357, 358, 360, 361, 362, 458, 459, 460, 461, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 478, 479, 480, 481, 485, 486, 487, 488, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 512, 513, 514, 515, 520, 521, 522, 523, 524, 525, 526, 527, 529, 530, 531, 532, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 547, 548, 549, 550, 551, 555, 556, 557, 558, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 583, 584, 585, 586, 587, 588, 593, 594, 595, 596, 598, 599, 600, 601, 602, 603, 606, 607, 608, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 623, 624, 625, 626, 627, 631, 632, 633, 634, 639, 640, 641, 642, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 662, 663, 664, 665, 666, 667, 672, 673, 674, 675, 676, 677, 678, 679, 682, 683, 684, 686, 687, 688, 689, 690, 691, 692, 693, 695, 696, 697, 698, 699, 700, 701, 703, 704, 705, 706, 707, 708, 712, 714, 720, 721, 722, 723, 724, 727, 728, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 747, 748, 750, 755, 757, 758, 759, 760, 761, 763, 764, 765, 766, 767, 769, 770, 771, 772, 773, 774, 775, 776, 777, 779, 780, 781, 782, 783, 784, 788, 790, 796, 798, 799, 800, 801, 814, 815, 816, 817, 818, 819, 820, 823, 826, 827, 835, 838, 839, 840, 841, 842, 844, 845, 846, 847, 848, 852, 853, 854, 856, 857, 858, 860, 861, 862, 863, 865, 869, 871, 877, 897, 898, 914, 915, 916, 917, 918, 919, 920, 921, 923, 924, 925, 926, 927, 929, 930, 931, 935, 937, 943, 944, 945, 946, 947, 949, 950, 951, 955, 956, 957, 958, 959, 961, 964, 966, 971, 972, 973, 974, 975, 976, 977, 978, 979, 981, 982, 983, 984, 985, 987, 989, 990, 994, 995, 996, 997, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1012, 1013, 1014, 1020, 1021, 1022, 1023, 1025, 1026, 1029, 1030, 1043, 1044, 1045, 1047, 1048, 1049, 1051, 1052, 1053, 1055, 1057, 1059, 1063, 1064, 1065, 1066, 1072, 1073, 1074, 1075, 1077, 1078, 1079, 1089, 1090, 1091, 1111, 1114, 1115, 1116, 1117, 1119, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1130, 1132, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1142, 1144, 1146, 1148, 1150, 1174, 1176, 1177, 1178, 1179, 1181, 1184, 1186, 1187, 1188, 1189, 1190, 1191, 1194, 1196, 1197, 1198, 1199, 1200, 1202, 1204, 1205, 1207, 1210, 1213, 1215, 1235, 1236, 1247, 1249, 1254, 1256, 1275, 1276, 1277, 1278, 1279, 1286, 1287, 1288, 1289, 1290, 1292, 1294, 1296 }

B grade: { 4, 7, 13, 17, 22, 23, 28, 29, 33, 34, 40, 41, 54, 61, 62, 66, 107, 114, 115, 118, 124, 189, 191, 197, 199, 1149 }

C grade: { 1281, 1283, 1285 }

F grade: { 5, 6, 14, 15, 16, 24, 25, 26, 27, 35, 36, 37, 38, 39, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 55, 56, 57, 58, 59, 60, 63, 64, 65, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 108, 109, 110, 111, 112, 113, 116, 117, 119, 120, 121, 122, 123, 125, 126, 127, 128, 129, 130, 131, 132, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 153, 155, 161, 163, 169, 171, 174, 176, 178, 180, 182, 184, 185, 187, 188, 190, 193, 195, 196, 198, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 253, 254, 259, 261, 262, 263, 264, 265, 267, 269, 270, 271, 272, 273, 275, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 359, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 462, 477, 482, 483, 484, 489, 490, 491, 492, 493, 510, 511, 516, 517, 518, 519, 528, 533, 546, 552, 553, 554, 559, 560, 561, 562, 581, 582, 589, 590, 591, 592, 597, 604, 605, 609, 622, 628, 629, 630, 635, 636, 637, 638, 643, 660, 661, 668, 669, 670, 671, 680, 681, 685, 694, 702, 709, 710, 711, 713, 715, 716, 717, 718, 719, 725, 726, 729, 730, 731, 732, 745, 746, 749, 751, 752, 753, 754, 756, 762, 768, 778, 785, 786, 787, 789, 791, 792, 793, 794, 795, 797, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 821, 822, 824, 825, 828, 829, 830, 831, 832, 833, 834, 836, 837, 843, 849, 850, 851, 855, 859, 864, 866, 867, 868, 870, 872, 873, 874, 875, 876, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 922, 928, 932, 933, 934, 936, 938, 939, 940, 941, 942, 948, 952, 953, 954, 960, 962, 963, 965, 967, 968, 969, 970, 980, 986, 988, 991, 992, 993, 998, 999, 1000, 1001, 1002, 1011, 1015, 1016, 1017, 1018, 1019, 1024, 1027, 1028, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1046, 1050, 1054, 1056, 1058, 1060, 1061, 1062, 1067, 1068, 1069, 1070, 1071, 1076, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1112, 1113, 1118, 1120, 1129, 1131, 1133, 1141, 1143, 1145, 1147, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1175, 1180, 1182, 1183, 1185, 1192, 1193, 1195, 1201, 1203, 1206, 1208, 1209, 1211, 1212, 1214, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1248, 1250, 1251, 1252, 1253, 1255, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1280, 1282, 1284, 1291, 1293, 1295, 1297, 1298, 1299, 1300, 1301 }

2.1.7 Giac

A grade: { 133, 148, 251, 252, 256, 257, 355, 356, 357, 358, 361, 362, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 478, 479, 480, 481, 485, 486, 487, 488, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 509, 513, 515, 521, 522, 523, 524, 525, 526, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 547, 548, 549, 550, 551, 555, 556, 557, 558, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 580, 584, 586, 600, 601, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 623, 624, 625, 626, 644, 645, 646, 647, 648, 649, 650, 651, 652, 683, 684, 685, 686, 687, 688, 690, 691, 692, 694, 695, 696, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 712, 713, 714, 720, 722, 726, 730, 733, 735, 736, 737, 738, 739, 740, 741, 742, 744, 747, 748, 749, 750, 755, 756, 757, 758, 759, 762, 763, 764, 765, 768, 769, 770, 771, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 788, 789, 796, 798, 803, 808, 812, 814, 815, 816, 817, 818, 819, 820, 821, 823, 826, 827, 828, 830, 835, 836, 837, 838, 839, 840, 843, 849, 852, 855, 858, 859, 860, 861, 864, 870, 879, 884, 889, 893, 895, 896, 897, 898, 899, 900, 901, 902, 903, 906, 907, 908, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 935, 945, 946, 947, 949, 950, 951, 953, 954, 955, 956, 957, 958, 959, 960, 961, 965, 966, 972, 976, 980, 984, 986, 1008, 1009, 1010, 1012, 1013, 1014, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1026, 1030, 1032, 1033, 1039, 1041, 1042, 1046, 1050, 1054, 1056, 1077, 1078, 1081, 1082, 1085, 1086, 1088, 1089, 1090, 1091, 1092, 1093, 1095, 1099, 1101, 1102, 1108, 1110, 1111, 1112, 1113, 1174, 1176, 1184, 1186, 1194, 1196, 1202, 1204, 1205, 1207, 1210, 1213, 1215, 1222, 1224, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1242, 1244, 1246, 1275, 1276 }

B grade: { 177, 1277, 1278, 1279 }

C grade: { }

F grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 253, 254, 255, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 359, 360, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 477, 482, 483, 484, 489, 490, 491, 492, 493, 508, 510, 511, 512, 514, 516, 517, 518, 519, 520, 527, 528, 529, 530, 546, 552, 553, 554, 559, 560, 561, 562, 563, 564, 565, 566, 579, 581, 582, 583, 585, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 602, 603, 604, 605, 606, 622, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 689, 693, 697, 709, 710, 711, 715, 716, 717, 718, 719, 721, 723, 724, 725, 727, 728, 729, 731, 732, 734, 743, 745, 746, 751, 752, 753, 754, 760, 761, 766, 767, 772, 773, 785, 786, 787, 790, 791, 792, 793, 794, 795, 797, 799, 800, 801, 802, 804, 805, 806, 807, 809, 810, 811, 813, 822, 824, 825, 829, 831, 832, 833, 834, 841, 842, 844, 845, 846, 847, 848, 850, 851, 853, 854, 856, 857, 862, 863, 865, 866, 867, 868, 869, 871, 872, 873, 874, 875, 876, 877, 878, 880, 881, 882, 883, 885, 886, 887, 888, 890, 891, 892, 894, 904, 905, 909, 910, 911, 912, 931, 932, 933, 934, 936, 937, 938, 939, 940, 941, 942, 943, 944, 948, 952, 962, 963, 964, 967, 968, 969, 970, 971, 973, 974, 975, 977, 978, 979, 981, 982, 983, 985, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1011, 1015, 1025, 1027, 1028, 1029, 1031, 1034, 1035, 1036, 1037, 1038, 1040, 1043, 1044, 1045, 1047, 1048, 1049, 1051, 1052, 1053, 1055, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1079, 1080, 1083, 1084, 1087, 1094, 1096, 1097, 1098, 1100, 1103, 1104, 1105, 1106, 1107, 1109, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1175, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1185, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1195, 1197, 1198, 1199, 1200, 1201, 1203, 1206, 1208, 1209, 1211, 1212, 1214, 1216, 1217, 1218, 1219, 1220, 1221, 1223, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1241, 1243, 1245, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301 }

2.1.8 Mupad

A grade: { 133, 148, 251, 252, 253, 254, 255, 256, 257, 355, 356, 357, 358, 359, 360, 361, 362, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 478, 479, 480, 481, 485, 486, 487, 488, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 512, 513, 514, 515, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 547, 548, 549, 550, 551, 555, 556, 557, 558, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 583, 584, 585, 586, 587, 588, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 623, 624, 625, 626, 627, 631, 632, 633, 634, 639, 640, 641, 642, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 662, 663, 664, 665, 666, 667, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 703, 704, 705, 706, 707, 708, 712, 713, 714, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 747, 748, 749, 750, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 779, 780, 781, 782, 783, 784, 788, 789, 790, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 826, 827, 828, 829, 830, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 860, 861, 862, 863, 864, 865, 869, 870, 871, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 906, 907, 908, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 929, 930, 931, 935, 936, 937, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 964, 965, 966, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 987, 988, 989, 990, 994, 995, 996, 997, 998, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1029, 1030, 1031, 1032, 1033, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1057, 1058, 1059, 1063, 1064, 1065, 1066, 1067, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1098, 1099, 1100, 1101, 1102, 1107, 1108, 1109, 1110, 1111, 1113, 1174, 1176, 1177, 1178, 1179, 1181, 1184, 1186, 1187, 1188, 1189, 1190, 1191, 1194, 1196, 1197, 1198, 1199, 1200, 1202, 1204, 1205, 1207, 1210, 1213, 1215, 1217, 1222, 1224, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1242, 1244, 1246, 1299 }

B grade: { 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 175, 177, 179, 181, 183, 185, 186, 187, 189, 191, 192, 193, 194, 195, 197, 199, 258, 260, 266, 268, 274, 276, 286, 292, 293, 294, 299, 300, 301, 302, 391, 397, 398, 399, 404, 405, 406, 407, 477, 546, 622, 643, 702, 778, 859, 928, 986, 1056, 1112, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1159, 1166, 1167, 1247, 1249, 1254, 1256, 1275, 1276, 1277, 1278, 1279, 1281, 1286, 1287, 1288, 1289, 1290 }

C grade: { }

F grade: { 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, 60, 61, 62, 63, 64, 65, 66, 67, 68, 69, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 174, 176, 178, 180, 182, 184, 188, 190, 196, 198, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 259, 261, 262, 263, 264, 265, 267, 269, 270, 271, 272, 273, 275, 277, 278, 279, 280, 281, 282, 283, 284, 285, 287, 288, 289, 290, 291, 295, 296, 297, 298, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 392, 393, 394, 395, 396, 400, 401, 402, 403, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 482, 483, 484, 489, 490, 491, 492, 493, 510, 511, 516, 517, 518, 519, 552, 553, 554, 559, 560, 561, 562, 581, 582, 589, 590, 591, 592, 628, 629, 630, 635, 636, 637, 638, 660, 661, 668, 669, 670, 671, 709, 710, 711, 715, 716, 717, 718, 719, 745, 746, 751, 752, 753, 754, 785, 786, 787, 791, 792, 793, 794, 795, 824, 825, 831, 832, 833, 834, 866, 867, 868, 872, 873, 874, 875, 876, 904, 905, 909, 910, 911, 912, 932, 933, 934, 938, 939, 940, 941, 942, 962, 963, 967, 968, 969, 970, 991, 992, 993, 999, 1000, 1001, 1002, 1027, 1028, 1034, 1035, 1036, 1037, 1060, 1061, 1062, 1068, 1069, 1070, 1071, 1096, 1097, 1103, 1104, 1105, 1106, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1160, 1161, 1162, 1163, 1164, 1165, 1168, 1169, 1170, 1171, 1172, 1173, 1175, 1180, 1182, 1183, 1185, 1192, 1193, 1195, 1201, 1203, 1206, 1208, 1209, 1211, 1212, 1214, 1216, 1218, 1219, 1220, 1221, 1223, 1225, 1226, 1227, 1228, 1229, 1230, 1241, 1243, 1245, 1248, 1250, 1251, 1252, 1253, 1255, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1280, 1282, 1283, 1284, 1285, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1300, 1301 }

2.2 Detailed conclusion table per each integral for all CAS systems

Detailed conclusion table per each integral is given by table below. The elapsed time is in seconds. For failed result it is given as F(-1) if the failure was due to timeout. It is given as F(-2) if the failure was due to an exception being raised, which could indicate a bug in the system. If the failure was due to integral not being evaluated within the time limit, then it is given just an F.

In this table,the column **normalized size** is defined as $\frac{\text{antiderivative leaf size}}{\text{optimal antiderivative leaf size}}$

Problem 1	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	98	108	109	124	184	0	109
normalized size	1	1.00	0.84	0.92	0.93	1.06	1.57	0.00	0.93
time (sec)	N/A	0.103	0.082	0.031	0.407	2.499	3.397	0.000	0.739

Problem 2	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	88	98	99	113	167	0	99
normalized size	1	1.00	0.84	0.93	0.94	1.08	1.59	0.00	0.94
time (sec)	N/A	0.094	0.065	0.032	0.407	0.874	3.081	0.000	0.711

Problem 3	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	76	87	88	104	158	0	87
normalized size	1	1.00	0.84	0.96	0.97	1.14	1.74	0.00	0.96
time (sec)	N/A	0.077	0.049	0.031	0.410	1.614	2.890	0.000	0.382

Problem 4	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	53	53	84	71	73	89	128	0	73
normalized size	1	1.00	1.58	1.34	1.38	1.68	2.42	0.00	1.38
time (sec)	N/A	0.031	0.005	0.028	0.404	0.668	2.577	0.000	0.324

Problem 5	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	76	113	0	0	0	0	63
normalized size	1	1.00	1.00	1.49	0.00	0.00	0.00	0.00	0.83
time (sec)	N/A	0.086	0.005	0.047	0.000	0.468	0.000	0.000	0.618

Problem 6	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	75	127	0	0	0	0	93
normalized size	1	1.00	0.97	1.65	0.00	0.00	0.00	0.00	1.21
time (sec)	N/A	0.100	0.051	0.055	0.000	0.555	0.000	0.000	0.859

Problem 7	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	88	91	75	100	182	0	79
normalized size	1	1.00	1.35	1.40	1.15	1.54	2.80	0.00	1.22
time (sec)	N/A	0.055	0.064	0.043	0.410	0.438	3.473	0.000	0.541

Problem 8	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	94	101	87	111	197	0	176
normalized size	1	1.00	0.89	0.95	0.82	1.05	1.86	0.00	1.66
time (sec)	N/A	0.091	0.056	0.042	0.409	0.445	4.628	0.000	0.883

Problem 9	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	99	112	102	120	214	0	116
normalized size	1	1.00	0.80	0.90	0.82	0.97	1.73	0.00	0.94
time (sec)	N/A	0.096	0.056	0.046	0.410	0.440	7.154	0.000	0.580

Problem 10	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	124	166	185	172	270	0	152
normalized size	1	1.00	0.75	1.00	1.11	1.04	1.63	0.00	0.92
time (sec)	N/A	0.163	0.132	0.030	0.416	0.460	4.534	0.000	0.756

Problem 11	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	116	154	174	160	250	0	140
normalized size	1	1.00	0.76	1.01	1.14	1.05	1.64	0.00	0.92
time (sec)	N/A	0.150	0.120	0.029	0.410	0.441	4.129	0.000	0.740

Problem 12	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	101	141	155	148	240	0	125
normalized size	1	1.00	0.74	1.04	1.14	1.09	1.76	0.00	0.92
time (sec)	N/A	0.127	0.097	0.031	0.411	0.455	3.839	0.000	0.683

Problem 13	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	57	133	138	127	206	0	109
normalized size	1	1.00	0.69	1.60	1.66	1.53	2.48	0.00	1.31
time (sec)	N/A	0.046	0.042	0.034	0.412	0.457	3.228	0.000	0.399

Problem 14	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	103	177	142	0	0	0	131
normalized size	1	1.00	0.80	1.37	1.10	0.00	0.00	0.00	1.02
time (sec)	N/A	0.127	0.100	0.054	0.614	0.488	0.000	0.000	0.725

Problem 15	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	79	152	0	0	0	0	141
normalized size	1	1.00	0.89	1.71	0.00	0.00	0.00	0.00	1.58
time (sec)	N/A	0.138	0.097	0.053	0.000	0.451	0.000	0.000	0.603

Problem 16	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	139	217	0	0	0	0	161
normalized size	1	1.00	0.91	1.43	0.00	0.00	0.00	0.00	1.06
time (sec)	N/A	0.154	0.078	0.069	0.000	0.422	0.000	0.000	0.745

Problem 17	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	114	145	144	144	253	0	120
normalized size	1	1.00	1.31	1.67	1.66	1.66	2.91	0.00	1.38
time (sec)	N/A	0.082	0.097	0.044	0.412	0.444	9.279	0.000	0.641

Problem 18	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	152	160	152	156	275	0	142
normalized size	1	1.00	0.94	0.99	0.94	0.97	1.71	0.00	0.88
time (sec)	N/A	0.150	0.072	0.039	0.410	0.486	16.395	0.000	0.696

Problem 19	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	171	171	124	172	183	168	287	0	244
normalized size	1	1.00	0.73	1.01	1.07	0.98	1.68	0.00	1.43
time (sec)	N/A	0.158	0.092	0.039	0.415	0.451	26.067	0.000	0.919

Problem 20	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	248	209	261	200	328	0	186
normalized size	1	1.00	1.21	1.02	1.27	0.98	1.60	0.00	0.91
time (sec)	N/A	0.184	0.115	0.031	0.412	0.454	5.379	0.000	0.886

Problem 21	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	234	197	242	188	316	0	174
normalized size	1	1.00	1.23	1.03	1.27	0.98	1.65	0.00	0.91
time (sec)	N/A	0.171	0.094	0.032	0.416	0.438	4.904	0.000	0.828

Problem 22	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	132	184	222	176	296	0	160
normalized size	1	1.00	0.84	1.17	1.41	1.12	1.89	0.00	1.02
time (sec)	N/A	0.097	0.110	0.032	0.422	0.443	4.590	0.000	0.728

Problem 23	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	77	176	197	160	267	0	147
normalized size	1	1.00	0.77	1.76	1.97	1.60	2.67	0.00	1.47
time (sec)	N/A	0.054	0.042	0.030	0.417	0.433	4.098	0.000	0.693

Problem 24	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	139	220	184	0	0	0	196
normalized size	1	1.00	0.82	1.29	1.08	0.00	0.00	0.00	1.15
time (sec)	N/A	0.175	0.140	0.055	0.619	0.434	0.000	0.000	0.833

Problem 25	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F(-1)	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	162	162	150	223	201	0	0	0	195
normalized size	1	1.00	0.93	1.38	1.24	0.00	0.00	0.00	1.20
time (sec)	N/A	0.173	0.126	0.064	0.612	0.612	0.000	0.000	0.721

Problem 26	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	164	243	0	0	0	0	205
normalized size	1	1.00	0.91	1.35	0.00	0.00	0.00	0.00	1.14
time (sec)	N/A	0.178	0.129	0.063	0.000	0.576	0.000	0.000	0.726

Problem 27	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F(-1)	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	170	255	0	0	0	0	221
normalized size	1	1.00	0.90	1.35	0.00	0.00	0.00	0.00	1.17
time (sec)	N/A	0.203	0.104	0.066	0.000	0.461	0.000	0.000	0.973

Problem 28	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	165	190	202	174	311	0	154
normalized size	1	1.00	1.60	1.84	1.96	1.69	3.02	0.00	1.50
time (sec)	N/A	0.091	0.132	0.044	0.423	0.495	26.546	0.000	0.665

Problem 29	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	185	200	224	185	326	0	174
normalized size	1	1.00	1.23	1.33	1.49	1.23	2.17	0.00	1.16
time (sec)	N/A	0.107	0.106	0.056	0.418	0.531	48.017	0.000	0.951

Problem 30	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	214	214	188	215	248	198	347	0	192
normalized size	1	1.00	0.88	1.00	1.16	0.93	1.62	0.00	0.90
time (sec)	N/A	0.178	0.119	0.047	0.413	0.546	84.078	0.000	1.059

Problem 31	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	238	238	290	249	337	229	389	0	217
normalized size	1	1.00	1.22	1.05	1.42	0.96	1.63	0.00	0.91
time (sec)	N/A	0.214	0.171	0.038	0.414	0.501	6.702	0.000	2.589

Problem 32	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	276	237	318	217	367	0	205
normalized size	1	1.00	1.43	1.23	1.65	1.12	1.90	0.00	1.06
time (sec)	N/A	0.167	0.129	0.046	0.414	0.453	5.985	0.000	0.642

Problem 33	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	264	224	290	205	360	0	191
normalized size	1	1.00	1.48	1.26	1.63	1.15	2.02	0.00	1.07
time (sec)	N/A	0.113	0.112	0.034	0.414	1.362	5.472	0.000	0.793

Problem 34	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	77	216	264	187	316	0	175
normalized size	1	1.00	0.62	1.73	2.11	1.50	2.53	0.00	1.40
time (sec)	N/A	0.063	0.032	0.043	0.413	0.614	4.596	0.000	0.743

Problem 35	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	174	260	220	0	0	0	248
normalized size	1	1.00	0.86	1.28	1.08	0.00	0.00	0.00	1.22
time (sec)	N/A	0.211	0.151	0.066	0.625	0.475	0.000	0.000	0.986

Problem 36	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F(-1)	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	181	264	241	0	0	0	253
normalized size	1	1.00	0.95	1.39	1.27	0.00	0.00	0.00	1.33
time (sec)	N/A	0.207	0.155	0.063	0.636	0.463	0.000	0.000	0.816

Problem 37	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F(-1)	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	173	173	163	248	251	0	0	0	258
normalized size	1	1.00	0.94	1.43	1.45	0.00	0.00	0.00	1.49
time (sec)	N/A	0.199	0.149	0.070	0.616	0.450	0.000	0.000	0.892

Problem 38	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	201	201	193	277	0	0	0	0	261
normalized size	1	1.00	0.96	1.38	0.00	0.00	0.00	0.00	1.30
time (sec)	N/A	0.218	0.158	0.070	0.000	0.441	0.000	0.000	0.833

Problem 39	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F(-1)	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	227	298	0	0	0	0	298
normalized size	1	1.00	1.00	1.31	0.00	0.00	0.00	0.00	1.31
time (sec)	N/A	0.230	0.125	0.066	0.000	0.440	0.000	0.000	0.943

Problem 40	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	B	B	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	191	230	275	201	366	0	186
normalized size	1	1.00	1.63	1.97	2.35	1.72	3.13	0.00	1.59
time (sec)	N/A	0.097	0.174	0.046	0.427	0.508	71.851	0.000	0.734

Problem 41	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	235	243	290	215	388	0	208
normalized size	1	1.00	1.40	1.45	1.73	1.28	2.31	0.00	1.24
time (sec)	N/A	0.114	0.130	0.067	0.418	0.464	138.241	0.000	0.897

Problem 42	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	F(-1)	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	243	243	293	255	329	230	0	0	317
normalized size	1	1.00	1.21	1.05	1.35	0.95	0.00	0.00	1.30
time (sec)	N/A	0.196	0.107	0.052	0.412	0.540	0.000	0.000	1.174

Problem 43	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	166	353	0	0	0	0	-1
normalized size	1	1.00	0.85	1.80	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.286	0.476	0.102	0.000	0.430	0.000	0.000	0.000

Problem 44	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	132	308	0	0	0	0	-1
normalized size	1	1.00	0.85	1.97	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.181	0.203	0.081	0.000	0.485	0.000	0.000	0.000

Problem 45	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	108	244	0	0	0	0	-1
normalized size	1	1.00	0.98	2.22	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.104	0.181	0.069	0.000	0.530	0.000	0.000	0.000

Problem 46	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	60	142	0	0	0	0	-1
normalized size	1	1.00	1.02	2.41	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.047	0.017	0.045	0.000	0.508	0.000	0.000	0.000

Problem 47	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	54	54	102	193	0	43	0	0	-1
normalized size	1	1.00	1.89	3.57	0.00	0.80	0.00	0.00	-0.02
time (sec)	N/A	0.071	0.062	0.061	0.000	0.553	0.000	0.000	0.000

Problem 48	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	149	252	0	0	0	0	-1
normalized size	1	1.00	1.49	2.52	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.155	0.101	0.066	0.000	0.526	0.000	0.000	0.000

Problem 49	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	178	335	0	0	0	0	-1
normalized size	1	1.00	1.11	2.08	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.236	0.187	0.068	0.000	0.534	0.000	0.000	0.000

Problem 50	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	197	197	254	369	0	0	0	0	-1
normalized size	1	1.00	1.29	1.87	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.339	0.145	0.075	0.000	0.474	0.000	0.000	0.000

Problem 51	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	203	203	186	367	0	0	0	0	-1
normalized size	1	1.00	0.92	1.81	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.222	1.042	0.069	0.000	0.428	0.000	0.000	0.000

Problem 52	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	167	167	153	316	0	0	0	0	-1
normalized size	1	1.00	0.92	1.89	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.190	0.813	0.082	0.000	0.438	0.000	0.000	0.000

Problem 53	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	128	293	0	0	0	0	-1
normalized size	1	1.00	1.05	2.40	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.147	0.099	0.063	0.000	0.424	0.000	0.000	0.000

Problem 54	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	42	76	0	50	116	0	-1
normalized size	1	1.00	0.61	1.10	0.00	0.72	1.68	0.00	-0.01
time (sec)	N/A	0.047	0.036	0.046	0.000	0.485	1.944	0.000	0.000

Problem 55	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	128	251	0	0	0	0	-1
normalized size	1	1.00	0.85	1.67	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.194	0.164	0.076	0.000	0.434	0.000	0.000	0.000

Problem 56	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	194	194	165	340	0	0	0	0	-1
normalized size	1	1.00	0.85	1.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.241	0.313	0.079	0.000	0.464	0.000	0.000	0.000

Problem 57	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	222	380	0	0	0	0	-1
normalized size	1	1.00	0.91	1.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.268	0.368	0.082	0.000	0.432	0.000	0.000	0.000

Problem 58	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	256	256	235	423	356	0	0	0	-1
normalized size	1	1.00	0.92	1.65	1.39	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.285	1.061	0.072	0.446	0.478	0.000	0.000	0.000

Problem 59	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	216	375	327	0	0	0	-1
normalized size	1	1.00	0.96	1.67	1.45	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.243	0.862	0.066	0.427	0.437	0.000	0.000	0.000

Problem 60	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	187	349	293	0	0	0	-1
normalized size	1	1.00	1.06	1.98	1.66	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.217	0.171	0.067	0.395	0.494	0.000	0.000	0.000

Problem 61	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	63	128	71	83	194	0	-1
normalized size	1	1.00	0.72	1.45	0.81	0.94	2.20	0.00	-0.01
time (sec)	N/A	0.077	0.088	0.056	0.341	0.605	10.222	0.000	0.000

Problem 62	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	55	93	66	75	158	0	-1
normalized size	1	1.00	0.60	1.01	0.72	0.82	1.72	0.00	-0.01
time (sec)	N/A	0.055	0.043	0.052	0.346	0.470	3.691	0.000	0.000

Problem 63	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	195	195	162	327	399	0	0	0	-1
normalized size	1	1.00	0.83	1.68	2.05	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.242	0.235	0.073	0.422	0.474	0.000	0.000	0.000

Problem 64	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	B	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	227	394	519	0	0	0	-1
normalized size	1	1.00	0.91	1.58	2.08	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.288	0.332	0.079	0.428	0.453	0.000	0.000	0.000

Problem 65	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	B	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	306	306	285	481	594	0	0	0	-1
normalized size	1	1.00	0.93	1.57	1.94	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.320	0.586	0.101	0.442	0.428	0.000	0.000	0.000

Problem 66	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	73	93	83	93	168	0	-1
normalized size	1	1.00	0.73	0.93	0.83	0.93	1.68	0.00	-0.01
time (sec)	N/A	0.051	0.049	0.054	0.334	0.429	4.267	0.000	0.000

Problem 67	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	B	A	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	88	148	126	21	0	0	-1
normalized size	1	1.00	1.80	3.02	2.57	0.43	0.00	0.00	-0.02
time (sec)	N/A	0.064	0.027	0.060	0.413	0.468	0.000	0.000	0.000

Problem 68	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	285	499	0	0	0	0	-1
normalized size	1	1.00	0.99	1.74	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.596	0.859	0.101	0.000	0.452	0.000	0.000	0.000

Problem 69	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	255	255	241	467	0	0	0	0	-1
normalized size	1	1.00	0.95	1.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.491	0.637	0.108	0.000	0.467	0.000	0.000	0.000

Problem 70	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	208	416	0	0	0	0	-1
normalized size	1	1.00	0.99	1.97	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.358	0.539	0.107	0.000	0.542	0.000	0.000	0.000

Problem 71	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	151	367	0	0	0	0	-1
normalized size	1	1.00	1.16	2.82	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.121	0.269	0.109	0.000	0.464	0.000	0.000	0.000

Problem 72	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	216	216	272	7034	0	0	0	0	-1
normalized size	1	1.00	1.26	32.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.421	0.485	0.794	0.000	0.473	0.000	0.000	0.000

Problem 73	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	228	228	289	5963	0	0	0	0	-1
normalized size	1	1.00	1.27	26.15	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.466	0.438	2.071	0.000	0.469	0.000	0.000	0.000

Problem 74	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	190	487	0	0	0	0	-1
normalized size	1	1.00	1.19	3.06	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.339	0.299	0.128	0.000	0.447	0.000	0.000	0.000

Problem 75	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	240	556	0	0	0	0	-1
normalized size	1	1.00	1.07	2.48	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.432	0.551	0.125	0.000	0.636	0.000	0.000	0.000

Problem 76	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	373	373	342	650	0	0	0	0	-1
normalized size	1	1.00	0.92	1.74	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.973	1.275	0.106	0.000	0.454	0.000	0.000	0.000

Problem 77	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	333	333	306	612	0	0	0	0	-1
normalized size	1	1.00	0.92	1.84	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.857	1.252	0.108	0.000	0.604	0.000	0.000	0.000

Problem 78	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	257	556	0	0	0	0	-1
normalized size	1	1.00	0.88	1.90	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.621	0.822	0.106	0.000	0.508	0.000	0.000	0.000

Problem 79	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	205	523	0	0	0	0	-1
normalized size	1	1.00	1.07	2.72	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.197	0.669	0.106	0.000	1.377	0.000	0.000	0.000

Problem 80	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	300	300	360	1542	0	0	0	0	-1
normalized size	1	1.00	1.20	5.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.578	0.663	3.661	0.000	0.501	0.000	0.000	0.000

Problem 81	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	317	317	378	11959	0	0	0	0	-1
normalized size	1	1.00	1.19	37.73	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.620	0.676	2.584	0.000	0.594	0.000	0.000	0.000

Problem 82	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	337	337	388	1647	0	0	0	0	-1
normalized size	1	1.00	1.15	4.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.645	0.903	6.408	0.000	0.443	0.000	0.000	0.000

Problem 83	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	267	267	253	669	0	0	0	0	-1
normalized size	1	1.00	0.95	2.51	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.268	0.703	0.117	0.000	0.458	0.000	0.000	0.000

Problem 84	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	438	438	408	750	0	0	0	0	-1
normalized size	1	1.00	0.93	1.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.366	1.970	0.105	0.000	0.762	0.000	0.000	0.000

Problem 85	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	402	402	369	712	0	0	0	0	-1
normalized size	1	1.00	0.92	1.77	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.196	1.510	0.115	0.000	0.460	0.000	0.000	0.000

Problem 86	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	307	307	325	656	0	0	0	0	-1
normalized size	1	1.00	1.06	2.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.614	1.402	0.122	0.000	0.446	0.000	0.000	0.000

Problem 87	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	226	226	267	620	0	0	0	0	-1
normalized size	1	1.00	1.18	2.74	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.206	0.954	0.110	0.000	0.505	0.000	0.000	0.000

Problem 88	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	385	385	465	1651	0	0	0	0	-1
normalized size	1	1.00	1.21	4.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.769	0.965	6.332	0.000	0.433	0.000	0.000	0.000

Problem 89	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	402	402	512	1739	0	0	0	0	-1
normalized size	1	1.00	1.27	4.33	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.736	0.631	8.250	0.000	0.614	0.000	0.000	0.000

Problem 90	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	416	416	500	1840	0	0	0	0	-1
normalized size	1	1.00	1.20	4.42	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.753	1.148	6.753	0.000	0.428	0.000	0.000	0.000

Problem 91	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	429	429	595	1814	0	0	0	0	-1
normalized size	1	1.00	1.39	4.23	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.890	0.797	8.401	0.000	0.435	0.000	0.000	0.000

Problem 92	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	322	757	0	0	0	0	-1
normalized size	1	1.00	1.10	2.58	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.322	0.899	0.122	0.000	0.619	0.000	0.000	0.000

Problem 93	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	384	384	363	816	0	0	0	0	-1
normalized size	1	1.00	0.95	2.12	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.367	1.401	0.117	0.000	0.471	0.000	0.000	0.000

Problem 94	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	513	513	401	853	0	0	0	0	-1
normalized size	1	1.00	0.78	1.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.517	1.612	0.125	0.000	0.974	0.000	0.000	0.000

Problem 95	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	356	356	421	1331	0	0	0	0	-1
normalized size	1	1.00	1.18	3.74	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.823	1.038	7.939	0.000	0.732	0.000	0.000	0.000

Problem 96	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	330	1212	0	0	0	0	-1
normalized size	1	1.00	1.19	4.38	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.513	0.602	4.065	0.000	0.781	0.000	0.000	0.000

Problem 97	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	239	4589	0	0	0	0	-1
normalized size	1	1.00	1.24	23.90	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.293	0.522	0.911	0.000	0.552	0.000	0.000	0.000

Problem 98	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	95	1062	0	0	0	0	-1
normalized size	1	1.00	0.97	10.84	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.133	0.038	0.553	0.000	0.865	0.000	0.000	0.000

Problem 99	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	113	1741	0	0	0	0	-1
normalized size	1	1.00	1.28	19.78	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.161	0.122	0.500	0.000	0.479	0.000	0.000	0.000

Problem 100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	265	9235	0	0	0	0	-1
normalized size	1	1.00	1.42	49.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.398	0.924	1.289	0.000	0.429	0.000	0.000	0.000

Problem 101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	273	273	372	2221	0	0	0	0	-1
normalized size	1	1.00	1.36	8.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.624	1.209	7.153	0.000	0.659	0.000	0.000	0.000

Problem 102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	365	365	535	2380	0	0	0	0	-1
normalized size	1	1.00	1.47	6.52	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.975	1.210	9.979	0.000	1.037	0.000	0.000	0.000

Problem 103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	433	433	502	1498	0	0	0	0	-1
normalized size	1	1.00	1.16	3.46	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.827	2.544	7.904	0.000	0.429	0.000	0.000	0.000

Problem 104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	364	364	429	1395	0	0	0	0	-1
normalized size	1	1.00	1.18	3.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.614	1.979	5.345	0.000	0.428	0.000	0.000	0.000

Problem 105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	292	292	362	4774	0	0	0	0	-1
normalized size	1	1.00	1.24	16.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.495	1.385	0.884	0.000	0.638	0.000	0.000	0.000

Problem 106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	216	216	300	1059	0	0	0	0	-1
normalized size	1	1.00	1.39	4.90	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.342	0.848	0.405	0.000	0.511	0.000	0.000	0.000

Problem 107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	72	344	0	104	301	0	-1
normalized size	1	1.00	0.59	2.82	0.00	0.85	2.47	0.00	-0.01
time (sec)	N/A	0.122	0.198	0.081	0.000	0.471	10.371	0.000	0.000

Problem 108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	299	1921	0	0	0	0	-1
normalized size	1	1.00	1.35	8.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.616	1.043	0.544	0.000	0.459	0.000	0.000	0.000

Problem 109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	306	306	398	9420	0	0	0	0	-1
normalized size	1	1.00	1.30	30.78	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.767	2.704	1.530	0.000	0.539	0.000	0.000	0.000

Problem 110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	403	403	491	2378	0	0	0	0	-1
normalized size	1	1.00	1.22	5.90	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.934	3.136	7.142	0.000	0.631	0.000	0.000	0.000

Problem 111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	462	462	578	1618	0	0	0	0	-1
normalized size	1	1.00	1.25	3.50	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.833	2.669	5.834	0.000	0.491	0.000	0.000	0.000

Problem 112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	383	383	507	5012	0	0	0	0	-1
normalized size	1	1.00	1.32	13.09	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.675	1.657	0.934	0.000	0.612	0.000	0.000	0.000

Problem 113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	304	304	431	1276	0	0	0	0	-1
normalized size	1	1.00	1.42	4.20	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.560	1.261	0.470	0.000	0.599	0.000	0.000	0.000

Problem 114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	117	464	142	161	502	0	-1
normalized size	1	1.00	0.66	2.61	0.80	0.90	2.82	0.00	-0.01
time (sec)	N/A	0.217	0.392	0.095	0.477	1.420	84.073	0.000	0.000

Problem 115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	110	405	136	158	464	0	-1
normalized size	1	1.00	0.61	2.25	0.76	0.88	2.58	0.00	-0.01
time (sec)	N/A	0.180	0.192	0.073	0.674	0.623	65.267	0.000	0.000

Problem 116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	299	299	435	2151	0	0	0	0	-1
normalized size	1	1.00	1.45	7.19	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.795	1.701	0.598	0.000	0.622	0.000	0.000	0.000

Problem 117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	391	391	549	9659	0	0	0	0	-1
normalized size	1	1.00	1.40	24.70	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.976	3.850	1.625	0.000	0.666	0.000	0.000	0.000

Problem 118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	155	404	181	206	549	0	-1
normalized size	1	1.00	0.75	1.95	0.87	1.00	2.65	0.00	-0.00
time (sec)	N/A	0.222	0.230	0.087	0.428	0.800	90.242	0.000	0.000

Problem 119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	76	76	82	183	0	0	0	0	-1
normalized size	1	1.00	1.08	2.41	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.138	0.282	0.529	0.000	0.481	0.000	0.000	0.000

Problem 120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	382	382	693	2004	0	0	0	0	-1
normalized size	1	1.00	1.81	5.25	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.707	1.801	12.778	0.000	0.680	0.000	0.000	0.000

Problem 121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	298	298	528	1815	0	0	0	0	-1
normalized size	1	1.00	1.77	6.09	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.478	1.067	6.232	0.000	0.575	0.000	0.000	0.000

Problem 122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	367	7451	0	0	0	0	-1
normalized size	1	1.00	1.67	33.87	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.339	0.494	2.542	0.000	0.545	0.000	0.000	0.000

Problem 123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	133	2044	0	0	0	0	-1
normalized size	1	1.00	0.96	14.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.230	0.086	0.503	0.000	0.654	0.000	0.000	0.000

Problem 124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-2)	A	B	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	182	182	121	551	0	176	627	0	-1
normalized size	1	1.00	0.66	3.03	0.00	0.97	3.45	0.00	-0.01
time (sec)	N/A	0.220	0.238	0.889	0.000	0.672	37.132	0.000	0.000

Problem 125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	271	271	183	711	229	265	0	0	-1
normalized size	1	1.00	0.68	2.62	0.85	0.98	0.00	0.00	-0.00
time (sec)	N/A	0.403	0.299	1.024	0.476	0.879	0.000	0.000	0.000

Problem 126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	A	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	360	360	269	881	320	359	0	0	-1
normalized size	1	1.00	0.75	2.45	0.89	1.00	0.00	0.00	-0.00
time (sec)	N/A	0.674	0.318	1.093	0.568	0.533	0.000	0.000	0.000

Problem 127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	410	410	541	1725	0	0	0	0	-1
normalized size	1	1.00	1.32	4.21	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.862	1.031	12.328	0.000	0.500	0.000	0.000	0.000

Problem 128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	277	277	393	5478	0	0	0	0	-1
normalized size	1	1.00	1.42	19.78	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.503	0.798	0.984	0.000	1.331	0.000	0.000	0.000

Problem 129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	133	2044	0	0	0	0	-1
normalized size	1	1.00	0.96	14.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.215	0.079	0.315	0.000	1.088	0.000	0.000	0.000

Problem 130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	311	3393	0	0	0	0	-1
normalized size	1	1.00	2.43	26.51	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.232	0.182	0.465	0.000	0.569	0.000	0.000	0.000

Problem 131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	436	11233	0	0	0	0	-1
normalized size	1	1.00	1.66	42.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.600	1.488	1.321	0.000	0.571	0.000	0.000	0.000

Problem 132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	414	414	634	3058	0	0	0	0	-1
normalized size	1	1.00	1.53	7.39	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.020	2.641	21.296	0.000	0.792	0.000	0.000	0.000

Problem 133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	3.405	1.473	0.000	0.578	0.000	0.000	0.000

Problem 134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	297	297	484	394	0	0	0	0	-1
normalized size	1	1.00	1.63	1.33	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.270	3.574	0.065	0.000	0.723	0.000	0.000	0.000

Problem 135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	404	305	0	0	0	0	-1
normalized size	1	1.00	1.70	1.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.208	1.678	0.076	0.000	0.530	0.000	0.000	0.000

Problem 136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	329	235	0	0	0	0	-1
normalized size	1	1.00	1.84	1.31	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.159	1.585	0.052	0.000	0.504	0.000	0.000	0.000

Problem 137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	138	168	0	0	0	0	-1
normalized size	1	1.00	1.00	1.22	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.075	0.062	0.059	0.000	0.762	0.000	0.000	0.000

Problem 138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	169	260	0	0	0	0	-1
normalized size	1	1.00	0.93	1.44	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.186	0.100	0.061	0.000	1.688	0.000	0.000	0.000

Problem 139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	232	232	223	321	0	0	0	0	-1
normalized size	1	1.00	0.96	1.38	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.241	0.155	0.064	0.000	0.815	0.000	0.000	0.000

Problem 140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	298	393	0	0	0	0	-1
normalized size	1	1.00	1.02	1.34	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.284	0.186	0.080	0.000	0.687	0.000	0.000	0.000

Problem 141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	598	598	1413	2136	0	0	0	0	-1
normalized size	1	1.00	2.36	3.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.671	22.327	50.034	0.000	0.585	0.000	0.000	0.000

Problem 142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	430	430	1035	1784	0	0	0	0	-1
normalized size	1	1.00	2.41	4.15	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.425	17.979	40.436	0.000	0.602	0.000	0.000	0.000

Problem 143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	323	323	940	16024	0	0	0	0	-1
normalized size	1	1.00	2.91	49.61	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.266	15.932	15.750	0.000	0.518	0.000	0.000	0.000

Problem 144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	741	1297	0	0	0	0	-1
normalized size	1	1.00	3.32	5.82	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.048	14.968	0.240	0.000	0.927	0.000	0.000	0.000

Problem 145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	369	369	835	2363	0	0	0	0	-1
normalized size	1	1.00	2.26	6.40	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.433	14.956	0.714	0.000	0.628	0.000	0.000	0.000

Problem 146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	473	473	968	40579	0	0	0	0	-1
normalized size	1	1.00	2.05	85.79	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.604	17.850	24.031	0.000	1.288	0.000	0.000	0.000

Problem 147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	591	591	1173	2861	0	0	0	0	-1
normalized size	1	1.00	1.98	4.84	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.842	21.879	65.501	0.000	0.409	0.000	0.000	0.000

Problem 148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	21	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.031	0.530	0.737	0.000	0.669	0.000	0.000	0.000

Problem 149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	69	58	64	57	65	0	57
normalized size	1	1.00	1.00	0.84	0.93	0.83	0.94	0.00	0.83
time (sec)	N/A	0.086	0.006	0.025	0.428	0.951	1.456	0.000	0.307

Problem 150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	66	66	66	57	63	62	61	0	58
normalized size	1	1.00	1.00	0.86	0.95	0.94	0.92	0.00	0.88
time (sec)	N/A	0.095	0.022	0.026	0.324	0.681	1.004	0.000	0.230

Problem 151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	42	42	58	49	50	44	54	0	48
normalized size	1	1.00	1.38	1.17	1.19	1.05	1.29	0.00	1.14
time (sec)	N/A	0.025	0.004	0.024	0.327	0.610	0.799	0.000	0.480

Problem 152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	65	50	45	45	47	48	0	46
normalized size	1	1.30	1.00	0.90	0.90	0.94	0.96	0.00	0.92
time (sec)	N/A	0.023	0.010	0.025	0.327	1.013	0.572	0.000	0.164

Problem 153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	62	93	66	0	0	0	57
normalized size	1	1.00	1.00	1.50	1.06	0.00	0.00	0.00	0.92
time (sec)	N/A	0.066	0.004	0.047	0.494	0.497	0.000	0.000	0.546

Problem 154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	40	40	40	43	40	45	41	0	42
normalized size	1	1.00	1.00	1.08	1.00	1.12	1.02	0.00	1.05
time (sec)	N/A	0.055	0.005	0.032	0.331	0.476	0.752	0.000	0.163

Problem 155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F	F	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	74	110	95	0	0	0	71
normalized size	1	1.00	1.06	1.57	1.36	0.00	0.00	0.00	1.01
time (sec)	N/A	0.071	0.005	0.052	0.499	0.472	0.000	0.000	0.561

Problem 156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	63	63	58	58	56	57	61	0	57
normalized size	1	1.00	0.92	0.92	0.89	0.90	0.97	0.00	0.90
time (sec)	N/A	0.082	0.020	0.036	0.321	0.496	1.106	0.000	0.146

Problem 157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	111	96	98	91	104	0	89
normalized size	1	1.00	1.00	0.86	0.88	0.82	0.94	0.00	0.80
time (sec)	N/A	0.156	0.093	0.035	0.437	0.473	2.500	0.000	0.417

Problem 158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	106	93	95	94	105	0	81
normalized size	1	1.00	1.00	0.88	0.90	0.89	0.99	0.00	0.76
time (sec)	N/A	0.172	0.065	0.026	0.331	0.445	1.827	0.000	0.536

Problem 159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	98	85	62	77	92	0	71
normalized size	1	1.00	1.61	1.39	1.02	1.26	1.51	0.00	1.16
time (sec)	N/A	0.043	0.050	0.026	0.321	0.474	1.506	0.000	0.546

Problem 160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	65	79	77	79	88	0	69
normalized size	1	1.00	0.56	0.68	0.66	0.68	0.75	0.00	0.59
time (sec)	N/A	0.045	0.059	0.032	0.323	0.476	1.136	0.000	0.198

Problem 161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	99	99	99	134	104	0	0	0	105
normalized size	1	1.00	1.00	1.35	1.05	0.00	0.00	0.00	1.06
time (sec)	N/A	0.119	0.037	0.051	0.508	0.443	0.000	0.000	0.608

Problem 162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	62	78	71	75	82	0	76
normalized size	1	1.00	0.77	0.96	0.88	0.93	1.01	0.00	0.94
time (sec)	N/A	0.117	0.052	0.030	0.318	0.679	1.395	0.000	0.212

Problem 163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F	F	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	90	90	103	139	120	0	0	0	110
normalized size	1	1.00	1.14	1.54	1.33	0.00	0.00	0.00	1.22
time (sec)	N/A	0.123	0.047	0.060	0.485	0.542	0.000	0.000	0.498

Problem 164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	85	85	68	80	76	80	87	0	78
normalized size	1	1.00	0.80	0.94	0.89	0.94	1.02	0.00	0.92
time (sec)	N/A	0.124	0.057	0.038	0.329	0.635	1.396	0.000	0.466

Problem 165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	141	141	141	122	120	113	138	0	111
normalized size	1	1.00	1.00	0.87	0.85	0.80	0.98	0.00	0.79
time (sec)	N/A	0.207	0.145	0.024	0.421	0.568	3.826	0.000	0.437

Problem 166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	136	119	118	116	138	0	108
normalized size	1	1.00	1.00	0.88	0.87	0.85	1.01	0.00	0.79
time (sec)	N/A	0.233	0.088	0.030	0.318	0.497	2.974	0.000	0.438

Problem 167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	74	74	128	111	73	99	124	0	100
normalized size	1	1.00	1.73	1.50	0.99	1.34	1.68	0.00	1.35
time (sec)	N/A	0.050	0.088	0.034	0.318	0.612	2.432	0.000	0.413

Problem 168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	83	104	99	101	117	0	89
normalized size	1	1.00	0.52	0.65	0.61	0.63	0.73	0.00	0.55
time (sec)	N/A	0.076	0.079	0.025	0.318	0.571	1.906	0.000	0.246

Problem 169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	132	132	132	161	127	0	0	0	156
normalized size	1	1.00	1.00	1.22	0.96	0.00	0.00	0.00	1.18
time (sec)	N/A	0.154	0.055	0.046	0.472	0.626	0.000	0.000	0.667

Problem 170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	78	103	93	97	110	0	85
normalized size	1	1.00	0.72	0.95	0.86	0.90	1.02	0.00	0.79
time (sec)	N/A	0.156	0.074	0.033	0.328	0.528	2.237	0.000	0.563

Problem 171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F	F	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	154	177	155	0	0	0	152
normalized size	1	1.00	1.12	1.28	1.12	0.00	0.00	0.00	1.10
time (sec)	N/A	0.153	0.045	0.050	0.489	0.587	0.000	0.000	0.567

Problem 172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	83	107	96	100	117	0	97
normalized size	1	1.00	0.72	0.92	0.83	0.86	1.01	0.00	0.84
time (sec)	N/A	0.158	0.070	0.035	0.331	0.501	2.173	0.000	0.536

Problem 173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	56	73	74	54	110	0	73
normalized size	1	1.00	0.70	0.91	0.92	0.68	1.38	0.00	0.91
time (sec)	N/A	0.155	0.058	0.042	0.432	0.451	1.834	0.000	0.169

Problem 174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	120	238	0	0	0	0	-1
normalized size	1	1.00	1.06	2.11	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.142	0.035	0.118	0.000	0.478	0.000	0.000	0.000

Problem 175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	49	46	54	37	75	0	33
normalized size	1	1.00	1.00	0.94	1.10	0.76	1.53	0.00	0.67
time (sec)	N/A	0.073	0.029	0.033	0.425	0.462	1.047	0.000	0.157

Problem 176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	77	202	0	0	0	0	-1
normalized size	1	1.00	1.07	2.81	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.072	0.006	0.090	0.000	0.528	0.000	0.000	0.000

Problem 177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	14	14	36	35	14
normalized size	1	1.00	1.00	0.94	0.88	0.88	2.25	2.19	0.88
time (sec)	N/A	0.017	0.004	0.031	0.420	0.469	2.369	0.175	0.385

Problem 178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	103	251	0	0	0	0	-1
normalized size	1	1.00	1.61	3.92	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.100	0.027	0.112	0.000	0.491	0.000	0.000	0.000

Problem 179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	52	52	52	51	53	43	68	0	48
normalized size	1	1.00	1.00	0.98	1.02	0.83	1.31	0.00	0.92
time (sec)	N/A	0.087	0.008	0.043	0.442	0.678	1.469	0.000	0.455

Problem 180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	142	327	0	0	0	0	-1
normalized size	1	1.00	1.26	2.89	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.162	0.064	0.105	0.000	0.489	0.000	0.000	0.000

Problem 181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	88	81	90	71	117	0	78
normalized size	1	1.00	1.00	0.92	1.02	0.81	1.33	0.00	0.89
time (sec)	N/A	0.165	0.018	0.043	0.430	0.463	2.526	0.000	0.469

Problem 182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	90	281	0	0	0	0	-1
normalized size	1	1.00	0.57	1.79	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.363	0.245	0.115	0.000	0.460	0.000	0.000	0.000

Problem 183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	79	89	114	81	264	0	94
normalized size	1	1.00	0.82	0.93	1.19	0.84	2.75	0.00	0.98
time (sec)	N/A	0.180	0.066	0.046	0.434	0.534	2.087	0.000	0.458

Problem 184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	77	257	0	0	0	0	-1
normalized size	1	1.00	0.58	1.93	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.163	0.125	0.098	0.000	0.413	0.000	0.000	0.000

Problem 185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	64	64	47	59	83	49	0	0	48
normalized size	1	1.00	0.73	0.92	1.30	0.77	0.00	0.00	0.75
time (sec)	N/A	0.064	0.044	0.040	0.439	0.521	0.000	0.000	0.401

Problem 186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	62	62	39	57	59	40	107	0	40
normalized size	1	1.00	0.63	0.92	0.95	0.65	1.73	0.00	0.65
time (sec)	N/A	0.041	0.029	0.028	0.429	0.503	1.424	0.000	0.165

Problem 187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	44	56	78	46	0	0	48
normalized size	1	1.00	0.72	0.92	1.28	0.75	0.00	0.00	0.79
time (sec)	N/A	0.026	0.022	0.037	0.432	0.529	0.000	0.000	0.420

Problem 188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	117	117	72	298	0	0	0	0	-1
normalized size	1	1.00	0.62	2.55	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.184	0.170	0.124	0.000	0.477	0.000	0.000	0.000

Problem 189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	97	97	94	92	119	97	272	0	91
normalized size	1	1.00	0.97	0.95	1.23	1.00	2.80	0.00	0.94
time (sec)	N/A	0.162	0.076	0.049	0.437	0.487	1.424	0.000	0.485

Problem 190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	93	369	0	0	0	0	-1
normalized size	1	1.00	0.60	2.37	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.406	0.423	0.111	0.000	0.505	0.000	0.000	0.000

Problem 191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	136	136	124	125	160	127	360	0	123
normalized size	1	1.00	0.91	0.92	1.18	0.93	2.65	0.00	0.90
time (sec)	N/A	0.375	0.101	0.054	0.448	0.507	2.160	0.000	0.545

Problem 192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	58	102	108	69	243	0	62
normalized size	1	1.00	0.67	1.19	1.26	0.80	2.83	0.00	0.72
time (sec)	N/A	0.066	0.162	0.044	0.424	0.610	2.687	0.000	0.500

Problem 193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	64	101	129	83	0	0	80
normalized size	1	1.00	0.58	0.91	1.16	0.75	0.00	0.00	0.72
time (sec)	N/A	0.075	0.057	0.046	0.439	0.471	0.000	0.000	0.468

Problem 194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	55	77	86	69	235	0	103
normalized size	1	1.00	0.65	0.92	1.02	0.82	2.80	0.00	1.23
time (sec)	N/A	0.050	0.051	0.029	0.416	0.630	2.489	0.000	0.482

Problem 195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-2)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	68	96	129	85	0	0	85
normalized size	1	1.00	0.65	0.91	1.23	0.81	0.00	0.00	0.81
time (sec)	N/A	0.046	0.029	0.042	0.433	0.457	0.000	0.000	0.479

Problem 196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	159	159	90	340	0	0	0	0	-1
normalized size	1	1.00	0.57	2.14	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.284	0.238	0.107	0.000	0.573	0.000	0.000	0.000

Problem 197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	118	135	181	149	602	0	133
normalized size	1	1.00	0.83	0.95	1.27	1.05	4.24	0.00	0.94
time (sec)	N/A	0.263	0.102	0.052	0.444	0.587	2.514	0.000	0.571

Problem 198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	111	415	0	0	0	0	-1
normalized size	1	1.00	0.54	2.02	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.760	0.630	0.128	0.000	0.531	0.000	0.000	0.000

Problem 199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	B	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	142	170	223	179	722	0	163
normalized size	1	1.00	0.78	0.93	1.22	0.98	3.95	0.00	0.89
time (sec)	N/A	0.690	0.132	0.056	0.463	0.681	3.655	0.000	0.594

Problem 200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	105	176	127	94	0	0	-1
normalized size	1	1.00	0.66	1.10	0.79	0.59	0.00	0.00	-0.01
time (sec)	N/A	0.271	0.130	2.716	0.455	0.593	0.000	0.000	0.000

Problem 201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	298	298	278	199	0	0	0	0	-1
normalized size	1	1.00	0.93	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.270	3.007	1.304	0.000	0.535	0.000	0.000	0.000

Problem 202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	86	156	260	77	0	0	-1
normalized size	1	1.00	1.00	1.81	3.02	0.90	0.00	0.00	-0.01
time (sec)	N/A	0.061	0.108	0.930	0.529	0.589	0.000	0.000	0.000

Problem 203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	141	178	0	0	0	0	-1
normalized size	1	1.00	0.58	0.73	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.093	0.609	0.585	0.000	0.645	0.000	0.000	0.000

Problem 204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	164	151	0	0	0	0	-1
normalized size	1	1.00	0.72	0.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.221	0.190	0.703	0.000	0.598	0.000	0.000	0.000

Problem 205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	163	221	0	0	0	0	-1
normalized size	1	1.00	0.67	0.91	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.227	0.458	0.747	0.000	0.739	0.000	0.000	0.000

Problem 206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	240	240	165	169	0	0	0	0	-1
normalized size	1	1.00	0.69	0.70	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.349	1.124	1.056	0.000	0.739	0.000	0.000	0.000

Problem 207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	84	84	105	153	73	84	0	0	-1
normalized size	1	1.00	1.25	1.82	0.87	1.00	0.00	0.00	-0.01
time (sec)	N/A	0.102	0.124	1.221	0.458	0.789	0.000	0.000	0.000

Problem 208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	119	199	214	118	0	0	-1
normalized size	1	1.00	0.55	0.92	0.99	0.54	0.00	0.00	-0.00
time (sec)	N/A	0.765	0.172	2.558	0.523	0.751	0.000	0.000	0.000

Problem 209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	357	357	576	221	0	0	0	0	-1
normalized size	1	1.00	1.61	0.62	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.783	6.337	1.321	0.000	0.572	0.000	0.000	0.000

Problem 210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	101	179	406	98	0	0	-1
normalized size	1	1.00	0.93	1.64	3.72	0.90	0.00	0.00	-0.01
time (sec)	N/A	0.075	0.175	0.886	0.604	0.718	0.000	0.000	0.000

Problem 211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	298	298	351	201	0	0	0	0	-1
normalized size	1	1.00	1.18	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.138	2.734	0.563	0.000	0.770	0.000	0.000	0.000

Problem 212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	220	174	0	0	0	0	-1
normalized size	1	1.00	0.78	0.62	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.376	0.259	0.676	0.000	0.670	0.000	0.000	0.000

Problem 213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	300	300	218	240	0	0	0	0	-1
normalized size	1	1.00	0.73	0.80	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.422	0.953	0.705	0.000	0.579	0.000	0.000	0.000

Problem 214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	304	304	301	180	0	0	0	0	-1
normalized size	1	1.00	0.99	0.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.642	1.703	1.006	0.000	0.643	0.000	0.000	0.000

Problem 215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	263	245	0	0	0	0	-1
normalized size	1	1.00	0.85	0.79	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.434	0.503	1.340	0.000	0.498	0.000	0.000	0.000

Problem 216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	289	289	129	225	338	154	0	0	-1
normalized size	1	1.00	0.45	0.78	1.17	0.53	0.00	0.00	-0.00
time (sec)	N/A	1.977	0.251	2.671	0.601	0.558	0.000	0.000	0.000

Problem 217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	418	418	1059	245	0	0	0	0	-1
normalized size	1	1.00	2.53	0.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.031	15.277	1.350	0.000	0.728	0.000	0.000	0.000

Problem 218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	B	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	134	134	111	205	637	130	0	0	-1
normalized size	1	1.00	0.83	1.53	4.75	0.97	0.00	0.00	-0.01
time (sec)	N/A	0.085	0.217	0.904	0.685	0.622	0.000	0.000	0.000

Problem 219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	348	348	643	225	0	0	0	0	-1
normalized size	1	1.00	1.85	0.65	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.194	6.497	0.607	0.000	0.810	0.000	0.000	0.000

Problem 220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	329	329	268	198	0	0	0	0	-1
normalized size	1	1.00	0.81	0.60	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.550	0.352	0.737	0.000	0.624	0.000	0.000	0.000

Problem 221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	355	355	491	265	0	0	0	0	-1
normalized size	1	1.00	1.38	0.75	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.773	4.156	0.786	0.000	0.520	0.000	0.000	0.000

Problem 222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	364	364	361	204	0	0	0	0	-1
normalized size	1	1.00	0.99	0.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.144	2.078	1.077	0.000	1.053	0.000	0.000	0.000

Problem 223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	372	372	313	270	0	0	0	0	-1
normalized size	1	1.00	0.84	0.73	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.975	1.036	1.424	0.000	0.600	0.000	0.000	0.000

Problem 224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	91	165	89	80	0	0	-1
normalized size	1	1.00	0.76	1.38	0.74	0.67	0.00	0.00	-0.01
time (sec)	N/A	0.153	0.126	3.157	0.469	0.663	0.000	0.000	0.000

Problem 225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	158	184	0	0	0	0	-1
normalized size	1	1.00	0.63	0.74	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.147	0.619	3.030	0.000	0.470	0.000	0.000	0.000

Problem 226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	59	59	60	144	61	64	0	0	-1
normalized size	1	1.00	1.02	2.44	1.03	1.08	0.00	0.00	-0.02
time (sec)	N/A	0.058	0.064	0.918	0.489	0.563	0.000	0.000	0.000

Problem 227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	193	193	118	150	0	0	0	0	-1
normalized size	1	1.00	0.61	0.78	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.057	0.113	0.593	0.000	0.763	0.000	0.000	0.000

Problem 228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	100	139	0	0	0	0	-1
normalized size	1	1.00	0.56	0.79	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.134	0.144	0.669	0.000	0.504	0.000	0.000	0.000

Problem 229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	56	56	62	139	36	68	0	0	-1
normalized size	1	1.00	1.11	2.48	0.64	1.21	0.00	0.00	-0.02
time (sec)	N/A	0.093	0.096	0.585	0.477	0.598	0.000	0.000	0.000

Problem 230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	165	175	0	0	0	0	-1
normalized size	1	1.00	0.68	0.72	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.221	0.722	1.101	0.000	0.449	0.000	0.000	0.000

Problem 231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	110	163	81	89	0	0	-1
normalized size	1	1.00	0.93	1.38	0.69	0.75	0.00	0.00	-0.01
time (sec)	N/A	0.200	0.125	3.226	0.499	0.646	0.000	0.000	0.000

Problem 232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	107	242	0	102	0	0	-1
normalized size	1	1.00	1.00	2.26	0.00	0.95	0.00	0.00	-0.01
time (sec)	N/A	0.202	0.134	3.018	0.000	0.624	0.000	0.000	0.000

Problem 233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	155	247	0	0	0	0	-1
normalized size	1	1.00	0.62	0.98	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.159	0.254	2.998	0.000	0.534	0.000	0.000	0.000

Problem 234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	42	100	28	43	0	0	-1
normalized size	1	1.00	0.86	2.04	0.57	0.88	0.00	0.00	-0.02
time (sec)	N/A	0.055	0.053	0.858	0.502	0.624	0.000	0.000	0.000

Problem 235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	45	45	38	98	41	40	0	0	-1
normalized size	1	1.00	0.84	2.18	0.91	0.89	0.00	0.00	-0.02
time (sec)	N/A	0.025	0.048	0.456	0.337	1.192	0.000	0.000	0.000

Problem 236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	229	229	141	232	0	0	0	0	-1
normalized size	1	1.00	0.62	1.01	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.280	0.230	0.665	0.000	0.690	0.000	0.000	0.000

Problem 237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	122	231	0	104	0	0	-1
normalized size	1	1.00	1.18	2.24	0.00	1.01	0.00	0.00	-0.01
time (sec)	N/A	0.202	0.188	0.592	0.000	0.706	0.000	0.000	0.000

Problem 238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	300	300	258	273	0	0	0	0	-1
normalized size	1	1.00	0.86	0.91	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.614	1.315	1.116	0.000	0.618	0.000	0.000	0.000

Problem 239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	165	165	143	259	0	129	0	0	-1
normalized size	1	1.00	0.87	1.57	0.00	0.78	0.00	0.00	-0.01
time (sec)	N/A	0.495	0.339	2.924	0.000	0.634	0.000	0.000	0.000

Problem 240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	131	386	0	140	0	0	-1
normalized size	1	1.00	0.77	2.27	0.00	0.82	0.00	0.00	-0.01
time (sec)	N/A	0.433	0.211	5.819	0.000	0.532	0.000	0.000	0.000

Problem 241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	177	389	0	0	0	0	-1
normalized size	1	1.00	0.57	1.26	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.370	0.400	3.239	0.000	0.570	0.000	0.000	0.000

Problem 242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	112	112	65	244	65	74	0	0	-1
normalized size	1	1.00	0.58	2.18	0.58	0.66	0.00	0.00	-0.01
time (sec)	N/A	0.137	0.079	3.059	0.463	0.788	0.000	0.000	0.000

Problem 243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	57	240	93	67	0	0	-1
normalized size	1	1.00	0.74	3.12	1.21	0.87	0.00	0.00	-0.01
time (sec)	N/A	0.113	0.065	2.834	0.358	0.571	0.000	0.000	0.000

Problem 244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F(-2)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	51	244	66	64	0	0	-1
normalized size	1	1.00	0.65	3.09	0.84	0.81	0.00	0.00	-0.01
time (sec)	N/A	0.061	0.056	0.896	0.442	0.507	0.000	0.000	0.000

Problem 245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	63	240	86	72	0	0	-1
normalized size	1	1.00	0.62	2.38	0.85	0.71	0.00	0.00	-0.01
time (sec)	N/A	0.054	0.053	0.503	0.337	0.737	0.000	0.000	0.000

Problem 246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-2)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	168	370	0	0	0	0	-1
normalized size	1	1.00	0.60	1.33	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.430	0.380	0.720	0.000	0.685	0.000	0.000	0.000

Problem 247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	151	369	0	142	0	0	-1
normalized size	1	1.00	0.96	2.34	0.00	0.90	0.00	0.00	-0.01
time (sec)	N/A	0.337	0.255	0.664	0.000	0.586	0.000	0.000	0.000

Problem 248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	234	600	0	0	0	0	-1
normalized size	1	1.00	0.87	2.22	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.225	0.359	1.618	0.000	1.290	0.000	0.000	0.000

Problem 249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	201	201	175	376	0	0	0	0	-1
normalized size	1	1.00	0.87	1.87	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.157	0.144	1.402	0.000	0.615	0.000	0.000	0.000

Problem 250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	111	222	0	0	0	0	-1
normalized size	1	1.00	0.90	1.79	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.076	0.125	1.169	0.000	1.193	0.000	0.000	0.000

Problem 251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.048	0.913	0.651	0.000	1.007	0.000	0.000	0.000

Problem 252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.050	0.648	1.451	0.000	0.516	0.000	0.000	0.000

Problem 253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.086	0.986	0.936	0.000	0.536	0.000	0.000	0.000

Problem 254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.081	0.525	0.892	0.000	0.587	0.000	0.000	0.000

Problem 255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	113	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.170	0.109	0.932	0.000	0.564	0.000	0.000	0.000

Problem 256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.073	0.470	1.356	0.000	0.543	0.000	0.000	0.000

Problem 257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.084	0.532	1.594	0.000	0.727	0.000	0.000	0.000

Problem 258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	89	107	116	97	121	0	102
normalized size	1	1.00	0.72	0.86	0.94	0.78	0.98	0.00	0.82
time (sec)	N/A	0.425	0.040	0.041	0.445	1.340	1.949	0.000	0.573

Problem 259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	104	258	0	0	0	0	-1
normalized size	1	1.00	0.67	1.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.409	0.644	0.124	0.000	0.548	0.000	0.000	0.000

Problem 260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	64	85	87	74	94	0	83
normalized size	1	1.00	0.67	0.89	0.91	0.77	0.98	0.00	0.86
time (sec)	N/A	0.053	0.030	0.036	0.320	0.592	1.134	0.000	0.511

Problem 261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	82	233	0	0	0	0	-1
normalized size	1	1.00	0.64	1.82	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.096	0.053	0.095	0.000	1.280	0.000	0.000	0.000

Problem 262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	177	1078	0	0	0	0	-1
normalized size	1	1.00	1.05	6.38	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.311	0.046	3.746	0.000	0.635	0.000	0.000	0.000

Problem 263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	94	262	0	0	0	0	-1
normalized size	1	1.00	0.83	2.32	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.223	0.156	0.129	0.000	0.498	0.000	0.000	0.000

Problem 264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	196	196	208	1167	0	0	0	0	-1
normalized size	1	1.00	1.06	5.95	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.325	0.088	6.316	0.000	0.710	0.000	0.000	0.000

Problem 265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	103	323	0	0	0	0	-1
normalized size	1	1.00	0.76	2.39	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.312	0.627	0.109	0.000	0.690	0.000	0.000	0.000

Problem 266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	191	191	110	168	169	148	185	0	145
normalized size	1	1.00	0.58	0.88	0.88	0.77	0.97	0.00	0.76
time (sec)	N/A	0.789	0.084	0.036	0.429	0.625	3.285	0.000	0.545

Problem 267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	133	333	0	0	0	0	-1
normalized size	1	1.00	0.59	1.48	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.752	1.295	0.099	0.000	0.612	0.000	0.000	0.000

Problem 268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	153	153	84	142	111	123	158	0	135
normalized size	1	1.00	0.55	0.93	0.73	0.80	1.03	0.00	0.88
time (sec)	N/A	0.093	0.066	0.048	0.311	0.642	2.025	0.000	0.312

Problem 269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	112	304	0	0	0	0	-1
normalized size	1	1.00	0.55	1.48	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.139	0.694	0.098	0.000	0.701	0.000	0.000	0.000

Problem 270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	235	235	218	1173	0	0	0	0	-1
normalized size	1	1.00	0.93	4.99	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.515	0.336	6.293	0.000	0.532	0.000	0.000	0.000

Problem 271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	205	205	167	346	0	0	0	0	-1
normalized size	1	1.00	0.81	1.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.423	0.379	0.118	0.000	0.802	0.000	0.000	0.000

Problem 272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	207	207	226	1255	0	0	0	0	-1
normalized size	1	1.00	1.09	6.06	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.452	0.332	5.533	0.000	1.028	0.000	0.000	0.000

Problem 273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	216	216	189	375	0	0	0	0	-1
normalized size	1	1.00	0.88	1.74	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.440	0.412	0.082	0.000	0.664	0.000	0.000	0.000

Problem 274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	240	240	126	211	202	181	241	0	178
normalized size	1	1.00	0.52	0.88	0.84	0.75	1.00	0.00	0.74
time (sec)	N/A	1.227	0.101	0.036	0.418	0.680	4.970	0.000	0.513

Problem 275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	274	274	157	376	0	0	0	0	-1
normalized size	1	1.00	0.57	1.37	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.154	2.263	0.099	0.000	0.775	0.000	0.000	0.000

Problem 276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	100	185	133	156	207	0	156
normalized size	1	1.00	0.50	0.92	0.66	0.78	1.04	0.00	0.78
time (sec)	N/A	0.121	0.086	0.037	0.318	0.663	3.285	0.000	0.455

Problem 277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	268	268	137	346	0	0	0	0	-1
normalized size	1	1.00	0.51	1.29	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.184	1.264	0.107	0.000	0.422	0.000	0.000	0.000

Problem 278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	287	287	252	1217	0	0	0	0	-1
normalized size	1	1.00	0.88	4.24	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.743	0.567	11.000	0.000	0.418	0.000	0.000	0.000

Problem 279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	251	251	202	388	0	0	0	0	-1
normalized size	1	1.00	0.80	1.55	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.645	0.762	0.109	0.000	0.428	0.000	0.000	0.000

Problem 280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	299	299	333	1333	0	0	0	0	-1
normalized size	1	1.00	1.11	4.46	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.603	0.409	13.522	0.000	0.425	0.000	0.000	0.000

Problem 281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	221	417	0	0	0	0	-1
normalized size	1	1.00	0.88	1.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.608	0.619	0.115	0.000	0.550	0.000	0.000	0.000

Problem 282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	90	284	0	0	0	0	-1
normalized size	1	1.00	0.54	1.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.387	0.309	0.101	0.000	3.172	0.000	0.000	0.000

Problem 283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	123	1695	0	0	0	0	-1
normalized size	1	1.00	0.73	10.03	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.294	0.118	1.520	0.000	0.581	0.000	0.000	0.000

Problem 284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	98	98	69	230	0	0	0	0	-1
normalized size	1	1.00	0.70	2.35	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.167	0.180	0.094	0.000	0.764	0.000	0.000	0.000

Problem 285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	110	897	0	0	0	0	-1
normalized size	1	1.00	1.08	8.79	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.146	0.010	0.576	0.000	0.525	0.000	0.000	0.000

Problem 286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	14	14	0	0	14
normalized size	1	1.00	1.00	0.94	0.88	0.88	0.00	0.00	0.88
time (sec)	N/A	0.024	0.004	0.026	0.415	0.672	0.000	0.000	0.165

Problem 287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	243	1767	0	0	0	0	-1
normalized size	1	1.00	2.67	19.42	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.179	0.051	0.297	0.000	0.593	0.000	0.000	0.000

Problem 288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	73	292	0	0	0	0	-1
normalized size	1	1.00	0.79	3.17	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.195	0.195	0.123	0.000	0.446	0.000	0.000	0.000

Problem 289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	142	5491	0	0	0	0	-1
normalized size	1	1.00	0.80	30.85	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.336	0.331	1.038	0.000	0.649	0.000	0.000	0.000

Problem 290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	166	166	120	374	0	0	0	0	-1
normalized size	1	1.00	0.72	2.25	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.436	0.385	0.115	0.000	0.669	0.000	0.000	0.000

Problem 291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	192	192	117	1092	0	0	0	0	-1
normalized size	1	1.00	0.61	5.69	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.290	0.188	0.855	0.000	0.602	0.000	0.000	0.000

Problem 292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	106	106	68	97	151	69	0	0	96
normalized size	1	1.00	0.64	0.92	1.42	0.65	0.00	0.00	0.91
time (sec)	N/A	0.110	0.094	0.040	0.449	1.220	0.000	0.000	0.418

Problem 293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	47	84	104	48	0	0	50
normalized size	1	1.00	0.52	0.92	1.14	0.53	0.00	0.00	0.55
time (sec)	N/A	0.070	0.035	0.037	0.415	0.581	0.000	0.000	0.420

Problem 294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	65	91	146	67	0	0	101
normalized size	1	1.00	0.65	0.91	1.46	0.67	0.00	0.00	1.01
time (sec)	N/A	0.069	0.041	0.043	0.453	0.545	0.000	0.000	0.517

Problem 295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	170	170	119	1936	0	0	0	0	-1
normalized size	1	1.00	0.70	11.39	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.311	0.208	1.102	0.000	0.666	0.000	0.000	0.000

Problem 296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	109	369	0	0	0	0	-1
normalized size	1	1.00	0.62	2.08	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.340	0.339	0.122	0.000	0.586	0.000	0.000	0.000

Problem 297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	183	5115	0	0	0	0	-1
normalized size	1	1.00	0.73	20.46	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.740	0.672	7.516	0.000	0.426	0.000	0.000	0.000

Problem 298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	166	444	0	0	0	0	-1
normalized size	1	1.00	0.69	1.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.873	0.447	0.173	0.000	1.053	0.000	0.000	0.000

Problem 299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	74	154	185	87	0	0	85
normalized size	1	1.00	0.53	1.10	1.32	0.62	0.00	0.00	0.61
time (sec)	N/A	0.185	0.091	0.066	0.430	0.647	0.000	0.000	0.573

Problem 300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	95	164	232	114	0	0	150
normalized size	1	1.00	0.52	0.91	1.28	0.63	0.00	0.00	0.83
time (sec)	N/A	0.266	0.117	0.058	0.473	0.724	0.000	0.000	0.493

Problem 301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	71	127	163	87	0	0	85
normalized size	1	1.00	0.51	0.92	1.18	0.63	0.00	0.00	0.62
time (sec)	N/A	0.096	0.043	0.054	0.426	0.671	0.000	0.000	0.510

Problem 302	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	98	159	232	113	0	0	157
normalized size	1	1.00	0.58	0.94	1.37	0.67	0.00	0.00	0.93
time (sec)	N/A	0.119	0.050	0.056	0.471	0.693	0.000	0.000	0.527

Problem 303	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	236	236	156	1986	0	0	0	0	-1
normalized size	1	1.00	0.66	8.42	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.485	0.274	1.631	0.000	0.670	0.000	0.000	0.000

Problem 304	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	250	250	139	440	0	0	0	0	-1
normalized size	1	1.00	0.56	1.76	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.551	0.424	0.176	0.000	0.686	0.000	0.000	0.000

Problem 305	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	322	322	226	2217	0	0	0	0	-1
normalized size	1	1.00	0.70	6.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.333	0.819	5.272	0.000	0.609	0.000	0.000	0.000

Problem 306	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	317	317	189	517	0	0	0	0	-1
normalized size	1	1.00	0.60	1.63	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.526	0.816	0.149	0.000	0.677	0.000	0.000	0.000

Problem 307	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	385	385	360	235	0	0	0	0	-1
normalized size	1	1.00	0.94	0.61	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.425	1.218	2.542	0.000	0.741	0.000	0.000	0.000

Problem 308	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	436	436	267	302	0	0	0	0	-1
normalized size	1	1.00	0.61	0.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.135	1.285	1.774	0.000	0.738	0.000	0.000	0.000

Problem 309	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	260	198	0	0	0	0	-1
normalized size	1	1.00	0.93	0.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.176	0.622	1.139	0.000	0.741	0.000	0.000	0.000

Problem 310	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	340	340	201	268	0	0	0	0	-1
normalized size	1	1.00	0.59	0.79	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.215	0.416	0.842	0.000	0.526	0.000	0.000	0.000

Problem 311	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	439	439	250	337	0	0	0	0	-1
normalized size	1	1.00	0.57	0.77	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.513	0.267	0.974	0.000	1.567	0.000	0.000	0.000

Problem 312	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	458	458	265	309	0	0	0	0	-1
normalized size	1	1.00	0.58	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.529	0.795	0.937	0.000	0.702	0.000	0.000	0.000

Problem 313	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	328	328	222	255	0	0	0	0	-1
normalized size	1	1.00	0.68	0.78	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.856	1.929	1.352	0.000	1.530	0.000	0.000	0.000

Problem 314	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	275	275	239	195	0	0	0	0	-1
normalized size	1	1.00	0.87	0.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.427	1.720	1.530	0.000	0.574	0.000	0.000	0.000

Problem 315	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	476	476	797	271	0	0	0	0	-1
normalized size	1	1.00	1.67	0.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	4.073	4.812	2.276	0.000	0.692	0.000	0.000	0.000

Problem 316	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	531	531	527	338	0	0	0	0	-1
normalized size	1	1.00	0.99	0.64	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.186	3.673	1.532	0.000	0.757	0.000	0.000	0.000

Problem 317	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	334	334	601	237	0	0	0	0	-1
normalized size	1	1.00	1.80	0.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.232	4.306	1.059	0.000	0.782	0.000	0.000	0.000

Problem 318	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	438	438	439	304	0	0	0	0	-1
normalized size	1	1.00	1.00	0.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.311	0.985	0.711	0.000	0.770	0.000	0.000	0.000

Problem 319	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	530	530	496	365	0	0	0	0	-1
normalized size	1	1.00	0.94	0.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.882	3.395	0.893	0.000	1.495	0.000	0.000	0.000

Problem 320	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	556	556	376	356	0	0	0	0	-1
normalized size	1	1.00	0.68	0.64	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.968	1.090	0.873	0.000	1.992	0.000	0.000	0.000

Problem 321	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	567	567	455	412	0	0	0	0	-1
normalized size	1	1.00	0.80	0.73	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.655	3.190	1.346	0.000	1.998	0.000	0.000	0.000

Problem 322	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	579	579	537	343	0	0	0	0	-1
normalized size	1	1.00	0.93	0.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.146	7.382	1.958	0.000	0.741	0.000	0.000	0.000

Problem 323	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	578	578	1320	309	0	0	0	0	-1
normalized size	1	1.00	2.28	0.53	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	10.701	8.757	2.638	0.000	0.594	0.000	0.000	0.000

Problem 324	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	638	638	759	376	0	0	0	0	-1
normalized size	1	1.00	1.19	0.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	8.348	4.841	1.760	0.000	0.593	0.000	0.000	0.000

Problem 325	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	387	387	1087	275	0	0	0	0	-1
normalized size	1	1.00	2.81	0.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.281	7.879	1.194	0.000	1.321	0.000	0.000	0.000

Problem 326	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	516	516	771	342	0	0	0	0	-1
normalized size	1	1.00	1.49	0.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.390	1.656	0.818	0.000	0.964	0.000	0.000	0.000

Problem 327	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	605	605	889	404	0	0	0	0	-1
normalized size	1	1.00	1.47	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.263	7.136	1.063	0.000	0.622	0.000	0.000	0.000

Problem 328	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	655	655	626	399	0	0	0	0	-1
normalized size	1	1.00	0.96	0.61	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.408	1.794	1.091	0.000	0.558	0.000	0.000	0.000

Problem 329	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	661	661	761	454	0	0	0	0	-1
normalized size	1	1.00	1.15	0.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.621	7.589	1.506	0.000	0.562	0.000	0.000	0.000

Problem 330	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	675	675	644	401	0	0	0	0	-1
normalized size	1	1.00	0.95	0.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.309	4.757	1.814	0.000	0.725	0.000	0.000	0.000

Problem 331	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	315	315	279	206	0	0	0	0	-1
normalized size	1	1.00	0.89	0.65	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.426	0.700	3.075	0.000	0.710	0.000	0.000	0.000

Problem 332	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	344	344	175	271	0	0	0	0	-1
normalized size	1	1.00	0.51	0.79	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.334	0.359	2.912	0.000	0.593	0.000	0.000	0.000

Problem 333	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	126	180	0	0	0	0	-1
normalized size	1	1.00	0.57	0.82	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.143	0.248	1.071	0.000	2.004	0.000	0.000	0.000

Problem 334	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	256	256	140	0	0	0	0	0	-1
normalized size	1	1.00	0.55	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.154	0.118	0.579	0.000	0.656	0.000	0.000	0.000

Problem 335	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	145	197	0	0	0	0	-1
normalized size	1	1.00	0.64	0.87	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.253	0.169	0.766	0.000	0.785	0.000	0.000	0.000

Problem 336	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	128	171	0	0	0	0	-1
normalized size	1	1.00	0.62	0.82	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.252	0.430	0.774	0.000	0.624	0.000	0.000	0.000

Problem 337	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	328	328	231	261	0	0	0	0	-1
normalized size	1	1.00	0.70	0.80	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.475	1.234	1.300	0.000	1.253	0.000	0.000	0.000

Problem 338	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	311	311	228	206	0	0	0	0	-1
normalized size	1	1.00	0.73	0.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.628	2.701	2.183	0.000	0.655	0.000	0.000	0.000

Problem 339	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	305	305	209	294	0	0	0	0	-1
normalized size	1	1.00	0.69	0.96	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.396	0.867	2.784	0.000	0.617	0.000	0.000	0.000

Problem 340	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	349	349	228	0	0	0	0	0	-1
normalized size	1	1.00	0.65	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.341	0.361	2.720	0.000	0.922	0.000	0.000	0.000

Problem 341	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	78	78	50	116	73	51	0	0	-1
normalized size	1	1.00	0.64	1.49	0.94	0.65	0.00	0.00	-0.01
time (sec)	N/A	0.111	0.078	0.882	0.717	0.871	0.000	0.000	0.000

Problem 342	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	72	72	49	114	53	51	0	0	-1
normalized size	1	1.00	0.68	1.58	0.74	0.71	0.00	0.00	-0.01
time (sec)	N/A	0.046	0.062	0.454	0.486	0.669	0.000	0.000	0.000

Problem 343	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	204	306	0	0	0	0	-1
normalized size	1	1.00	0.66	0.99	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.506	0.312	0.767	0.000	0.662	0.000	0.000	0.000

Problem 344	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	226	279	0	0	0	0	-1
normalized size	1	1.00	0.77	0.95	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.431	1.116	0.763	0.000	0.695	0.000	0.000	0.000

Problem 345	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	422	422	371	376	0	0	0	0	-1
normalized size	1	1.00	0.88	0.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.128	2.385	1.437	0.000	0.569	0.000	0.000	0.000

Problem 346	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	397	397	270	318	0	0	0	0	-1
normalized size	1	1.00	0.68	0.80	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.202	3.598	2.443	0.000	0.619	0.000	0.000	0.000

Problem 347	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	400	400	229	454	0	0	0	0	-1
normalized size	1	1.00	0.57	1.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.818	1.344	5.709	0.000	0.516	0.000	0.000	0.000

Problem 348	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	444	444	239	0	0	0	0	0	-1
normalized size	1	1.00	0.54	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.769	0.586	3.118	0.000	0.630	0.000	0.000	0.000

Problem 349	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	81	276	0	92	0	0	-1
normalized size	1	1.00	0.47	1.60	0.00	0.53	0.00	0.00	-0.01
time (sec)	N/A	0.283	0.120	2.944	0.000	0.737	0.000	0.000	0.000

Problem 350	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	80	272	117	88	0	0	-1
normalized size	1	1.00	0.58	1.96	0.84	0.63	0.00	0.00	-0.01
time (sec)	N/A	0.267	0.090	2.804	0.429	0.479	0.000	0.000	0.000

Problem 351	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	71	276	0	82	0	0	-1
normalized size	1	1.00	0.52	2.01	0.00	0.60	0.00	0.00	-0.01
time (sec)	N/A	0.142	0.086	1.061	0.000	0.706	0.000	0.000	0.000

Problem 352	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	86	272	111	93	0	0	-1
normalized size	1	1.00	0.55	1.73	0.71	0.59	0.00	0.00	-0.01
time (sec)	N/A	0.102	0.076	0.568	0.435	0.684	0.000	0.000	0.000

Problem 353	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	389	389	246	460	0	0	0	0	-1
normalized size	1	1.00	0.63	1.18	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.783	0.516	0.901	0.000	0.776	0.000	0.000	0.000

Problem 354	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	381	381	296	433	0	0	0	0	-1
normalized size	1	1.00	0.78	1.14	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.686	1.696	0.803	0.000	0.578	0.000	0.000	0.000

Problem 355	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	1.895	1.587	0.000	0.704	0.000	0.000	0.000

Problem 356	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.964	1.543	0.000	0.552	0.000	0.000	0.000

Problem 357	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.062	0.914	0.600	0.000	0.602	0.000	0.000	0.000

Problem 358	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.700	1.618	0.000	0.548	0.000	0.000	0.000

Problem 359	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.109	1.041	1.108	0.000	0.670	0.000	0.000	0.000

Problem 360	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.098	0.159	1.047	0.000	0.681	0.000	0.000	0.000

Problem 361	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.102	0.529	1.436	0.000	0.679	0.000	0.000	0.000

Problem 362	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.115	0.710	1.670	0.000	0.665	0.000	0.000	0.000

Problem 363	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	135	313	0	0	0	0	-1
normalized size	1	1.00	0.62	1.43	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.114	0.669	0.151	0.000	0.743	0.000	0.000	0.000

Problem 364	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	211	211	171	2555	0	0	0	0	-1
normalized size	1	1.00	0.81	12.11	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.882	0.569	5.270	0.000	0.550	0.000	0.000	0.000

Problem 365	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	101	276	0	0	0	0	-1
normalized size	1	1.00	0.63	1.72	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.129	0.070	0.122	0.000	0.685	0.000	0.000	0.000

Problem 366	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	144	1635	0	0	0	0	-1
normalized size	1	1.00	0.84	9.51	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.182	0.048	3.227	0.000	0.787	0.000	0.000	0.000

Problem 367	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	276	276	284	460	0	0	0	0	-1
normalized size	1	1.00	1.03	1.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.523	0.071	6.440	0.000	0.693	0.000	0.000	0.000

Problem 368	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	169	169	188	1826	0	0	0	0	-1
normalized size	1	1.00	1.11	10.80	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.395	0.181	0.602	0.000	0.593	0.000	0.000	0.000

Problem 369	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	337	568	0	0	0	0	-1
normalized size	1	1.00	1.09	1.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.557	0.250	10.358	0.000	0.671	0.000	0.000	0.000

Problem 370	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	177	5426	0	0	0	0	-1
normalized size	1	1.00	0.94	28.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.585	0.394	3.709	0.000	0.767	0.000	0.000	0.000

Problem 371	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	313	313	165	411	0	0	0	0	-1
normalized size	1	1.00	0.53	1.31	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.283	1.327	0.158	0.000	0.551	0.000	0.000	0.000

Problem 372	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	321	321	233	1121	0	0	0	0	-1
normalized size	1	1.00	0.73	3.49	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.795	1.192	16.690	0.000	0.547	0.000	0.000	0.000

Problem 373	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	242	242	131	368	0	0	0	0	-1
normalized size	1	1.00	0.54	1.52	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.188	0.787	0.120	0.000	0.665	0.000	0.000	0.000

Problem 374	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	289	289	195	2691	0	0	0	0	-1
normalized size	1	1.00	0.67	9.31	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.245	0.605	5.527	0.000	0.740	0.000	0.000	0.000

Problem 375	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	370	370	302	566	0	0	0	0	-1
normalized size	1	1.00	0.82	1.53	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.970	0.577	11.189	0.000	0.781	0.000	0.000	0.000

Problem 376	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	284	284	246	5486	0	0	0	0	-1
normalized size	1	1.00	0.87	19.32	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.751	0.401	7.839	0.000	0.729	0.000	0.000	0.000

Problem 377	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	399	399	302	682	0	0	0	0	-1
normalized size	1	1.00	0.76	1.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.796	0.606	10.274	0.000	0.842	0.000	0.000	0.000

Problem 378	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	311	311	289	5651	0	0	0	0	-1
normalized size	1	1.00	0.93	18.17	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.789	0.519	11.291	0.000	0.730	0.000	0.000	0.000

Problem 379	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	381	381	191	471	0	0	0	0	-1
normalized size	1	1.00	0.50	1.24	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.725	2.182	0.132	0.000	0.581	0.000	0.000	0.000

Problem 380	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	389	389	281	1181	0	0	0	0	-1
normalized size	1	1.00	0.72	3.04	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.039	2.021	24.348	0.000	0.578	0.000	0.000	0.000

Problem 381	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	308	308	157	428	0	0	0	0	-1
normalized size	1	1.00	0.51	1.39	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.254	1.442	0.125	0.000	0.566	0.000	0.000	0.000

Problem 382	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	388	388	243	1134	0	0	0	0	-1
normalized size	1	1.00	0.63	2.92	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.340	1.217	9.655	0.000	0.780	0.000	0.000	0.000

Problem 383	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	447	447	350	664	0	0	0	0	-1
normalized size	1	1.00	0.78	1.49	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.655	1.068	17.054	0.000	0.530	0.000	0.000	0.000

Problem 384	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	354	354	298	10139	0	0	0	0	-1
normalized size	1	1.00	0.84	28.64	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.280	0.766	13.825	0.000	0.609	0.000	0.000	0.000

Problem 385	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	503	503	464	790	0	0	0	0	-1
normalized size	1	1.00	0.92	1.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.192	0.778	21.299	0.000	0.573	0.000	0.000	0.000

Problem 386	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	336	336	331	7948	0	0	0	0	-1
normalized size	1	1.00	0.99	23.65	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.109	0.736	11.110	0.000	0.421	0.000	0.000	0.000

Problem 387	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	154	1740	0	0	0	0	-1
normalized size	1	1.00	0.71	8.02	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.626	0.260	3.073	0.000	0.661	0.000	0.000	0.000

Problem 388	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	162	292	0	0	0	0	-1
normalized size	1	1.00	0.62	1.12	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.447	0.293	8.526	0.000	0.738	0.000	0.000	0.000

Problem 389	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	93	925	0	0	0	0	-1
normalized size	1	1.00	0.72	7.12	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.245	0.216	0.542	0.000	0.559	0.000	0.000	0.000

Problem 390	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	149	936	0	0	0	0	-1
normalized size	1	1.00	1.08	6.78	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.218	0.012	0.731	0.000	0.539	0.000	0.000	0.000

Problem 391	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	14	14	0	0	14
normalized size	1	1.00	1.00	0.94	0.88	0.88	0.00	0.00	0.88
time (sec)	N/A	0.024	0.004	0.033	0.614	0.614	0.000	0.000	0.127

Problem 392	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	354	1834	0	0	0	0	-1
normalized size	1	1.00	2.85	14.79	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.231	0.059	0.538	0.000	0.578	0.000	0.000	0.000

Problem 393	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	108	1829	0	0	0	0	-1
normalized size	1	1.00	0.89	14.99	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.286	0.178	0.342	0.000	0.432	0.000	0.000	0.000

Problem 394	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	262	262	189	479	0	0	0	0	-1
normalized size	1	1.00	0.72	1.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.511	0.405	11.508	0.000	0.487	0.000	0.000	0.000

Problem 395	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	227	227	180	5574	0	0	0	0	-1
normalized size	1	1.00	0.79	24.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.722	0.511	3.806	0.000	0.882	0.000	0.000	0.000

Problem 396	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	270	270	156	1227	0	0	0	0	-1
normalized size	1	1.00	0.58	4.54	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.413	0.197	1.007	0.000	0.695	0.000	0.000	0.000

Problem 397	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	74	124	218	76	0	0	119
normalized size	1	1.00	0.55	0.92	1.61	0.56	0.00	0.00	0.88
time (sec)	N/A	0.144	0.059	0.058	0.475	0.735	0.000	0.000	0.446

Problem 398	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	68	122	174	69	0	0	114
normalized size	1	1.00	0.51	0.92	1.31	0.52	0.00	0.00	0.86
time (sec)	N/A	0.122	0.049	0.046	0.446	0.640	0.000	0.000	0.428

Problem 399	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	71	118	213	73	0	0	119
normalized size	1	1.00	0.55	0.91	1.65	0.57	0.00	0.00	0.92
time (sec)	N/A	0.104	0.031	0.049	0.474	1.060	0.000	0.000	0.430

Problem 400	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	240	240	156	2089	0	0	0	0	-1
normalized size	1	1.00	0.65	8.70	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.428	0.234	1.359	0.000	0.720	0.000	0.000	0.000

Problem 401	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	234	234	157	2038	0	0	0	0	-1
normalized size	1	1.00	0.67	8.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.468	0.356	1.346	0.000	0.641	0.000	0.000	0.000

Problem 402	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	374	374	243	815	0	0	0	0	-1
normalized size	1	1.00	0.65	2.18	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.026	0.738	13.943	0.000	0.603	0.000	0.000	0.000

Problem 403	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	243	5190	0	0	0	0	-1
normalized size	1	1.00	0.73	15.63	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.290	0.934	5.132	0.000	0.631	0.000	0.000	0.000

Problem 404	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	212	212	105	220	289	117	0	0	205
normalized size	1	1.00	0.50	1.04	1.36	0.55	0.00	0.00	0.97
time (sec)	N/A	0.294	0.270	0.064	0.477	0.818	0.000	0.000	0.587

Problem 405	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	111	216	334	130	0	0	188
normalized size	1	1.00	0.47	0.91	1.41	0.55	0.00	0.00	0.79
time (sec)	N/A	0.389	0.076	0.062	0.520	0.658	0.000	0.000	0.537

Problem 406	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	103	191	272	117	0	0	189
normalized size	1	1.00	0.50	0.92	1.31	0.56	0.00	0.00	0.91
time (sec)	N/A	0.177	0.086	0.057	0.467	0.430	0.000	0.000	0.531

Problem 407	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	114	211	335	132	0	0	199
normalized size	1	1.00	0.51	0.94	1.49	0.59	0.00	0.00	0.88
time (sec)	N/A	0.196	0.061	0.069	0.522	0.966	0.000	0.000	0.536

Problem 408	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	208	2157	0	0	0	0	-1
normalized size	1	1.00	0.63	6.50	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.709	0.332	1.570	0.000	0.516	0.000	0.000	0.000

Problem 409	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	332	332	232	2115	0	0	0	0	-1
normalized size	1	1.00	0.70	6.37	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.754	0.566	1.449	0.000	0.779	0.000	0.000	0.000

Problem 410	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	478	478	295	891	0	0	0	0	-1
normalized size	1	1.00	0.62	1.86	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.838	1.097	11.529	0.000	0.514	0.000	0.000	0.000

Problem 411	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F(-1)	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	432	432	301	2319	0	0	0	0	-1
normalized size	1	1.00	0.70	5.37	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.160	1.216	5.109	0.000	1.158	0.000	0.000	0.000

Problem 412	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	523	523	262	417	0	0	0	0	-1
normalized size	1	1.00	0.50	0.80	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.437	1.224	2.757	0.000	0.923	0.000	0.000	0.000

Problem 413	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	747	747	1844	460	0	0	0	0	-1
normalized size	1	1.00	2.47	0.62	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.846	12.134	1.803	0.000	0.836	0.000	0.000	0.000

Problem 414	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	373	373	206	370	0	0	0	0	-1
normalized size	1	1.00	0.55	0.99	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.355	0.586	1.332	0.000	0.548	0.000	0.000	0.000

Problem 415	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	626	626	258	422	0	0	0	0	-1
normalized size	1	1.00	0.41	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.361	0.842	0.890	0.000	0.621	0.000	0.000	0.000

Problem 416	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	600	600	366	453	0	0	0	0	-1
normalized size	1	1.00	0.61	0.76	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.727	0.630	1.288	0.000	0.491	0.000	0.000	0.000

Problem 417	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	622	622	768	466	0	0	0	0	-1
normalized size	1	1.00	1.23	0.75	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.774	3.513	1.257	0.000	0.478	0.000	0.000	0.000

Problem 418	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	602	602	345	404	0	0	0	0	-1
normalized size	1	1.00	0.57	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.238	5.942	1.396	0.000	0.705	0.000	0.000	0.000

Problem 419	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	341	462	0	0	0	0	-1
normalized size	1	1.00	0.94	1.28	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.016	3.925	1.636	0.000	0.545	0.000	0.000	0.000

Problem 420	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	652	652	538	469	0	0	0	0	-1
normalized size	1	1.00	0.83	0.72	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	7.371	3.689	2.836	0.000	0.721	0.000	0.000	0.000

Problem 421	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	882	882	4015	514	0	0	0	0	-1
normalized size	1	1.00	4.55	0.58	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	5.470	18.272	1.865	0.000	0.543	0.000	0.000	0.000

Problem 422	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	477	477	441	421	0	0	0	0	-1
normalized size	1	1.00	0.92	0.88	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.416	3.994	1.316	0.000	0.607	0.000	0.000	0.000

Problem 423	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	760	760	2105	466	0	0	0	0	-1
normalized size	1	1.00	2.77	0.61	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.524	12.843	0.934	0.000	1.204	0.000	0.000	0.000

Problem 424	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	726	726	555	511	0	0	0	0	-1
normalized size	1	1.00	0.76	0.70	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.144	1.490	1.174	0.000	0.590	0.000	0.000	0.000

Problem 425	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	901	901	1387	602	0	0	0	0	-1
normalized size	1	1.00	1.54	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.237	7.067	1.270	0.000	0.730	0.000	0.000	0.000

Problem 426	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	919	919	691	592	0	0	0	0	-1
normalized size	1	1.00	0.75	0.64	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.016	9.515	1.700	0.000	0.634	0.000	0.000	0.000

Problem 427	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	788	788	1508	557	0	0	0	0	-1
normalized size	1	1.00	1.91	0.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.879	10.535	1.977	0.000	0.700	0.000	0.000	0.000

Problem 428	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	798	798	850	525	0	0	0	0	-1
normalized size	1	1.00	1.07	0.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	19.664	7.272	2.848	0.000	0.665	0.000	0.000	0.000

Problem 429	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1019	1019	6517	566	0	0	0	0	-1
normalized size	1	1.00	6.40	0.56	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	15.417	24.431	2.046	0.000	0.447	0.000	0.000	0.000

Problem 430	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	561	561	718	477	0	0	0	0	-1
normalized size	1	1.00	1.28	0.85	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.531	6.092	1.367	0.000	0.510	0.000	0.000	0.000

Problem 431	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	870	870	4281	518	0	0	0	0	-1
normalized size	1	1.00	4.92	0.60	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.792	18.950	0.970	0.000	0.544	0.000	0.000	0.000

Problem 432	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	845	845	1066	562	0	0	0	0	-1
normalized size	1	1.00	1.26	0.67	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.784	7.168	1.271	0.000	0.507	0.000	0.000	0.000

Problem 433	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1027	1027	3267	655	0	0	0	0	-1
normalized size	1	1.00	3.18	0.64	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.111	15.545	1.408	0.000	0.575	0.000	0.000	0.000

Problem 434	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1043	1043	1128	660	0	0	0	0	-1
normalized size	1	1.00	1.08	0.63	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.537	10.522	1.739	0.000	0.582	0.000	0.000	0.000

Problem 435	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1061	1061	1771	699	0	0	0	0	-1
normalized size	1	1.00	1.67	0.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	3.375	11.500	2.040	0.000	0.754	0.000	0.000	0.000

Problem 436	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	408	408	220	380	0	0	0	0	-1
normalized size	1	1.00	0.54	0.93	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.728	0.853	3.463	0.000	0.739	0.000	0.000	0.000

Problem 437	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	625	625	812	430	0	0	0	0	-1
normalized size	1	1.00	1.30	0.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.489	7.869	3.425	0.000	0.492	0.000	0.000	0.000

Problem 438	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	283	283	168	0	0	0	0	0	-1
normalized size	1	1.00	0.59	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.234	0.295	1.476	0.000	0.465	0.000	0.000	0.000

Problem 439	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	368	368	190	0	0	0	0	0	-1
normalized size	1	1.00	0.52	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.186	0.153	0.756	0.000	0.545	0.000	0.000	0.000

Problem 440	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	327	327	208	261	0	0	0	0	-1
normalized size	1	1.00	0.64	0.80	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.281	0.237	0.941	0.000	0.454	0.000	0.000	0.000

Problem 441	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	260	260	174	230	0	0	0	0	-1
normalized size	1	1.00	0.67	0.88	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.372	0.345	0.904	0.000	0.437	0.000	0.000	0.000

Problem 442	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	597	597	345	410	0	0	0	0	-1
normalized size	1	1.00	0.58	0.69	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.685	4.214	1.605	0.000	0.492	0.000	0.000	0.000

Problem 443	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	396	396	343	487	0	0	0	0	-1
normalized size	1	1.00	0.87	1.23	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.986	6.506	2.954	0.000	0.482	0.000	0.000	0.000

Problem 444	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	403	403	308	0	0	0	0	0	-1
normalized size	1	1.00	0.76	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.516	0.889	3.349	0.000	0.442	0.000	0.000	0.000

Problem 445	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	495	495	639	0	0	0	0	0	-1
normalized size	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.412	1.751	3.398	0.000	0.421	0.000	0.000	0.000

Problem 446	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	61	134	98	62	0	0	-1
normalized size	1	1.00	0.57	1.25	0.92	0.58	0.00	0.00	-0.01
time (sec)	N/A	0.131	0.102	1.118	0.891	0.417	0.000	0.000	0.000

Problem 447	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	56	132	99	58	0	0	-1
normalized size	1	1.00	0.56	1.32	0.99	0.58	0.00	0.00	-0.01
time (sec)	N/A	0.069	0.077	0.577	0.723	0.413	0.000	0.000	0.000

Problem 448	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	443	443	295	388	0	0	0	0	-1
normalized size	1	1.00	0.67	0.88	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.558	0.470	0.984	0.000	0.604	0.000	0.000	0.000

Problem 449	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	377	377	301	356	0	0	0	0	-1
normalized size	1	1.00	0.80	0.94	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.584	1.601	0.987	0.000	0.442	0.000	0.000	0.000

Problem 450	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	534	534	367	0	0	0	0	0	-1
normalized size	1	1.00	0.69	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.111	2.867	5.800	0.000	0.488	0.000	0.000	0.000

Problem 451	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	622	622	691	0	0	0	0	0	-1
normalized size	1	1.00	1.11	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.998	2.924	3.308	0.000	0.410	0.000	0.000	0.000

Problem 452	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	237	237	104	312	0	113	0	0	-1
normalized size	1	1.00	0.44	1.32	0.00	0.48	0.00	0.00	-0.00
time (sec)	N/A	0.412	0.142	2.631	0.000	0.413	0.000	0.000	0.000

Problem 453	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	199	95	308	0	106	0	0	-1
normalized size	1	1.00	0.48	1.55	0.00	0.53	0.00	0.00	-0.01
time (sec)	N/A	0.407	0.113	2.555	0.000	0.424	0.000	0.000	0.000

Problem 454	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	199	91	312	0	103	0	0	-1
normalized size	1	1.00	0.46	1.57	0.00	0.52	0.00	0.00	-0.01
time (sec)	N/A	0.194	0.108	0.993	0.000	0.408	0.000	0.000	0.000

Problem 455	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	104	308	0	111	0	0	-1
normalized size	1	1.00	0.48	1.43	0.00	0.52	0.00	0.00	-0.00
time (sec)	N/A	0.179	0.098	0.531	0.000	0.419	0.000	0.000	0.000

Problem 456	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	553	553	347	560	0	0	0	0	-1
normalized size	1	1.00	0.63	1.01	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.922	0.863	0.877	0.000	0.410	0.000	0.000	0.000

Problem 457	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	493	493	399	528	0	0	0	0	-1
normalized size	1	1.00	0.81	1.07	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.952	2.653	0.836	0.000	0.435	0.000	0.000	0.000

Problem 458	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	2.117	1.545	0.000	0.409	0.000	0.000	0.000

Problem 459	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	1.054	1.342	0.000	0.514	0.000	0.000	0.000

Problem 460	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.065	0.976	0.512	0.000	0.443	0.000	0.000	0.000

Problem 461	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.062	0.752	1.497	0.000	0.415	0.000	0.000	0.000

Problem 462	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.109	1.138	0.949	0.000	0.415	0.000	0.000	0.000

Problem 463	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.095	0.176	0.989	0.000	0.412	0.000	0.000	0.000

Problem 464	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.103	0.572	1.361	0.000	0.419	0.000	0.000	0.000

Problem 465	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.117	0.704	1.640	0.000	0.415	0.000	0.000	0.000

Problem 466	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	21	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.024	0.459	1.497	0.000	0.413	0.000	0.000	0.000

Problem 467	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.013	0.413	1.316	0.000	0.389	0.000	0.000	0.000

Problem 468	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	0.676	2.101	0.000	0.402	0.000	0.000	0.000

Problem 469	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	0.611	1.766	0.000	0.392	0.000	0.000	0.000

Problem 470	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.024	0.474	1.615	0.000	0.407	0.000	0.000	0.000

Problem 471	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.052	0.847	2.062	0.000	0.388	0.000	0.000	0.000

Problem 472	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.038	0.577	2.149	0.000	0.398	0.000	0.000	0.000

Problem 473	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.023	0.493	1.867	0.000	0.391	0.000	0.000	0.000

Problem 474	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.050	0.820	2.105	0.000	0.403	0.000	0.000	0.000

Problem 475	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.066	1.620	0.760	0.000	0.395	0.000	0.000	0.000

Problem 476	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.045	0.570	0.251	0.000	0.399	0.000	0.000	0.000

Problem 477	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	12	12	12	13	15	12	0	0	12
normalized size	1	1.00	1.00	1.08	1.25	1.00	0.00	0.00	1.00
time (sec)	N/A	0.026	0.015	0.084	0.321	0.396	0.000	0.000	0.091

Problem 478	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.066	0.203	0.251	0.000	0.399	0.000	0.000	0.000

Problem 479	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.068	0.220	0.536	0.000	0.392	0.000	0.000	0.000

Problem 480	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.069	4.249	1.009	0.000	0.393	0.000	0.000	0.000

Problem 481	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.069	2.860	0.682	0.000	0.394	0.000	0.000	0.000

Problem 482	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	25	30	0	74	0	0	-1
normalized size	1	1.00	0.76	0.91	0.00	2.24	0.00	0.00	-0.03
time (sec)	N/A	0.108	0.124	0.240	0.000	0.442	0.000	0.000	0.000

Problem 483	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	17	17	17	16	0	67	0	0	-1
normalized size	1	1.00	1.00	0.94	0.00	3.94	0.00	0.00	-0.06
time (sec)	N/A	0.071	0.043	0.234	0.000	0.397	0.000	0.000	0.000

Problem 484	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	23	30	0	70	0	0	-1
normalized size	1	1.00	0.70	0.91	0.00	2.12	0.00	0.00	-0.03
time (sec)	N/A	0.066	0.022	0.212	0.000	0.407	0.000	0.000	0.000

Problem 485	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.061	0.808	0.688	0.000	0.391	0.000	0.000	0.000

Problem 486	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.068	1.234	0.715	0.000	0.388	0.000	0.000	0.000

Problem 487	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	6.904	1.156	0.000	0.395	0.000	0.000	0.000

Problem 488	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	8.913	1.258	0.000	0.399	0.000	0.000	0.000

Problem 489	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	34	45	0	174	0	0	-1
normalized size	1	1.00	0.68	0.90	0.00	3.48	0.00	0.00	-0.02
time (sec)	N/A	0.127	0.164	0.307	0.000	0.556	0.000	0.000	0.000

Problem 490	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	27	32	0	171	0	0	-1
normalized size	1	1.00	0.77	0.91	0.00	4.89	0.00	0.00	-0.03
time (sec)	N/A	0.113	0.130	0.218	0.000	0.578	0.000	0.000	0.000

Problem 491	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	33	33	25	30	0	120	0	0	-1
normalized size	1	1.00	0.76	0.91	0.00	3.64	0.00	0.00	-0.03
time (sec)	N/A	0.110	0.072	0.190	0.000	0.471	0.000	0.000	0.000

Problem 492	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	35	35	27	32	0	171	0	0	-1
normalized size	1	1.00	0.77	0.91	0.00	4.89	0.00	0.00	-0.03
time (sec)	N/A	0.090	0.092	0.234	0.000	0.443	0.000	0.000	0.000

Problem 493	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	50	50	34	45	0	174	0	0	-1
normalized size	1	1.00	0.68	0.90	0.00	3.48	0.00	0.00	-0.02
time (sec)	N/A	0.087	0.027	0.265	0.000	0.460	0.000	0.000	0.000

Problem 494	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.065	0.988	1.269	0.000	0.419	0.000	0.000	0.000

Problem 495	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.078	1.402	0.843	0.000	0.401	0.000	0.000	0.000

Problem 496	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.074	2.255	1.602	0.000	0.407	0.000	0.000	0.000

Problem 497	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.039	0.290	1.250	0.000	0.423	0.000	0.000	0.000

Problem 498	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.105	1.358	1.661	0.000	0.402	0.000	0.000	0.000

Problem 499	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.085	2.338	1.582	0.000	0.403	0.000	0.000	0.000

Problem 500	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.044	0.417	1.279	0.000	0.398	0.000	0.000	0.000

Problem 501	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.129	1.474	1.700	0.000	0.444	0.000	0.000	0.000

Problem 502	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.095	2.398	1.746	0.000	0.440	0.000	0.000	0.000

Problem 503	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.068	0.447	1.429	0.000	0.418	0.000	0.000	0.000

Problem 504	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.135	1.465	1.819	0.000	1.346	0.000	0.000	0.000

Problem 505	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.082	0.842	1.319	0.000	0.421	0.000	0.000	0.000

Problem 506	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.043	0.207	0.737	0.000	0.412	0.000	0.000	0.000

Problem 507	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.114	0.646	0.950	0.000	0.447	0.000	0.000	0.000

Problem 508	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.133	4.868	2.938	0.000	0.435	0.000	0.000	0.000

Problem 509	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	F(-1)	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.131	180.002	3.851	0.000	0.454	0.000	0.000	0.000

Problem 510	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	37	82	0	0	0	0	-1
normalized size	1	1.00	0.95	2.10	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.169	0.118	0.961	0.000	0.457	0.000	0.000	0.000

Problem 511	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	39	39	37	136	0	0	0	0	-1
normalized size	1	1.00	0.95	3.49	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.090	0.046	0.631	0.000	0.433	0.000	0.000	0.000

Problem 512	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.125	1.189	1.046	0.000	0.462	0.000	0.000	0.000

Problem 513	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.125	1.112	1.088	0.000	0.440	0.000	0.000	0.000

Problem 514	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.138	5.900	5.326	0.000	0.410	0.000	0.000	0.000

Problem 515	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.138	101.316	3.605	0.000	0.437	0.000	0.000	0.000

Problem 516	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	52	125	0	0	0	0	-1
normalized size	1	1.00	0.60	1.44	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.276	0.155	2.676	0.000	0.526	0.000	0.000	0.000

Problem 517	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	53	84	0	0	0	0	-1
normalized size	1	1.00	0.61	0.97	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.273	0.117	3.593	0.000	0.534	0.000	0.000	0.000

Problem 518	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	51	125	0	0	0	0	-1
normalized size	1	1.00	0.59	1.44	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	0.135	0.967	0.000	0.722	0.000	0.000	0.000

Problem 519	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	87	87	50	179	0	0	0	0	-1
normalized size	1	1.00	0.57	2.06	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.133	0.048	0.637	0.000	0.546	0.000	0.000	0.000

Problem 520	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.125	1.321	1.079	0.000	0.581	0.000	0.000	0.000

Problem 521	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.128	1.396	1.138	0.000	0.505	0.000	0.000	0.000

Problem 522	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.057	0.751	1.544	0.000	0.413	0.000	0.000	0.000

Problem 523	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	0.861	1.431	0.000	0.553	0.000	0.000	0.000

Problem 524	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.564	1.312	0.000	0.629	0.000	0.000	0.000

Problem 525	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	0.371	0.482	0.000	0.681	0.000	0.000	0.000

Problem 526	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.477	1.416	0.000	0.632	0.000	0.000	0.000

Problem 527	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.068	0.500	1.559	0.000	0.561	0.000	0.000	0.000

Problem 528	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.115	1.507	1.033	0.000	0.462	0.000	0.000	0.000

Problem 529	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.114	0.809	1.007	0.000	0.588	0.000	0.000	0.000

Problem 530	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.099	0.211	1.064	0.000	0.514	0.000	0.000	0.000

Problem 531	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.107	0.507	1.591	0.000	0.572	0.000	0.000	0.000

Problem 532	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.121	0.582	1.691	0.000	0.599	0.000	0.000	0.000

Problem 533	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.124	0.632	1.707	0.000	0.653	0.000	0.000	0.000

Problem 534	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	21	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.023	0.783	1.572	0.000	0.514	0.000	0.000	0.000

Problem 535	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.012	0.582	1.521	0.000	0.451	0.000	0.000	0.000

Problem 536	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	0.935	2.076	0.000	0.416	0.000	0.000	0.000

Problem 537	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	0.976	1.730	0.000	0.436	0.000	0.000	0.000

Problem 538	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.023	1.185	1.710	0.000	0.425	0.000	0.000	0.000

Problem 539	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.049	1.185	1.733	0.000	0.420	0.000	0.000	0.000

Problem 540	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	1.002	2.090	0.000	0.424	0.000	0.000	0.000

Problem 541	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.021	0.779	1.995	0.000	0.417	0.000	0.000	0.000

Problem 542	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.051	1.221	1.974	0.000	0.409	0.000	0.000	0.000

Problem 543	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	39	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.082	1.081	1.799	0.000	0.400	0.000	0.000	0.000

Problem 544	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.073	0.600	0.837	0.000	0.409	0.000	0.000	0.000

Problem 545	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	32	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.047	0.301	0.240	0.000	0.389	0.000	0.000	0.000

Problem 546	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	14	14	14	15	14	14	0	0	14
normalized size	1	1.00	1.00	1.07	1.00	1.00	0.00	0.00	1.00
time (sec)	N/A	0.025	0.004	0.063	0.331	0.376	0.000	0.000	0.343

Problem 547	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	39	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.078	0.530	0.265	0.000	0.390	0.000	0.000	0.000

Problem 548	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	39	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.082	0.702	0.787	0.000	0.389	0.000	0.000	0.000

Problem 549	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	39	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.082	1.041	2.305	0.000	0.391	0.000	0.000	0.000

Problem 550	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	39	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.082	1.248	2.197	0.000	0.400	0.000	0.000	0.000

Problem 551	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	72	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.332	7.091	0.907	0.000	0.469	0.000	0.000	0.000

Problem 552	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	43	43	40	37	0	123	0	0	-1
normalized size	1	1.00	0.93	0.86	0.00	2.86	0.00	0.00	-0.02
time (sec)	N/A	0.139	0.121	0.300	0.000	0.459	0.000	0.000	0.000

Problem 553	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	36	38	0	115	0	0	-1
normalized size	1	1.00	0.88	0.93	0.00	2.80	0.00	0.00	-0.02
time (sec)	N/A	0.210	0.079	0.246	0.000	0.447	0.000	0.000	0.000

Problem 554	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	34	37	0	112	0	0	-1
normalized size	1	1.00	0.83	0.90	0.00	2.73	0.00	0.00	-0.02
time (sec)	N/A	0.093	0.072	0.226	0.000	0.511	0.000	0.000	0.000

Problem 555	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	74	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.357	1.670	0.893	0.000	0.429	0.000	0.000	0.000

Problem 556	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	73	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.244	2.794	0.933	0.000	0.481	0.000	0.000	0.000

Problem 557	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	111	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.499	3.432	2.584	0.000	0.438	0.000	0.000	0.000

Problem 558	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	112	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.396	3.309	2.487	0.000	0.463	0.000	0.000	0.000

Problem 559	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	86	86	83	58	0	292	0	0	-1
normalized size	1	1.00	0.97	0.67	0.00	3.40	0.00	0.00	-0.01
time (sec)	N/A	0.517	0.151	0.235	0.000	0.470	0.000	0.000	0.000

Problem 560	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	59	37	0	196	0	0	-1
normalized size	1	1.00	0.88	0.55	0.00	2.93	0.00	0.00	-0.01
time (sec)	N/A	0.280	0.202	0.207	0.000	0.507	0.000	0.000	0.000

Problem 561	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	61	61	75	60	0	286	0	0	-1
normalized size	1	1.00	1.23	0.98	0.00	4.69	0.00	0.00	-0.02
time (sec)	N/A	0.246	0.082	0.218	0.000	0.464	0.000	0.000	0.000

Problem 562	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	45	59	0	285	0	0	-1
normalized size	1	1.00	0.78	1.02	0.00	4.91	0.00	0.00	-0.02
time (sec)	N/A	0.114	0.123	0.280	0.000	0.495	0.000	0.000	0.000

Problem 563	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	113	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.662	1.775	1.654	0.000	0.444	0.000	0.000	0.000

Problem 564	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	111	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.426	2.339	1.135	0.000	0.444	0.000	0.000	0.000

Problem 565	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	159	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	1.220	3.224	4.029	0.000	0.418	0.000	0.000	0.000

Problem 566	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	155	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.897	3.955	2.552	0.000	0.443	0.000	0.000	0.000

Problem 567	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.068	1.678	1.714	0.000	0.435	0.000	0.000	0.000

Problem 568	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.474	1.096	0.000	0.453	0.000	0.000	0.000

Problem 569	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.096	3.643	1.544	0.000	0.446	0.000	0.000	0.000

Problem 570	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.077	4.203	1.792	0.000	0.410	0.000	0.000	0.000

Problem 571	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	0.990	1.191	0.000	0.398	0.000	0.000	0.000

Problem 572	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.109	4.405	1.690	0.000	0.395	0.000	0.000	0.000

Problem 573	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.078	2.113	1.946	0.000	0.429	0.000	0.000	0.000

Problem 574	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	0.881	1.276	0.000	0.472	0.000	0.000	0.000

Problem 575	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.111	2.396	1.539	0.000	0.464	0.000	0.000	0.000

Problem 576	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.076	1.239	1.306	0.000	0.532	0.000	0.000	0.000

Problem 577	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.648	0.729	0.000	0.433	0.000	0.000	0.000

Problem 578	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	64	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.217	1.314	0.818	0.000	0.467	0.000	0.000	0.000

Problem 579	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	101	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.372	9.960	3.204	0.000	0.637	0.000	0.000	0.000

Problem 580	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	98	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.366	8.914	4.299	0.000	0.496	0.000	0.000	0.000

Problem 581	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	55	210	0	0	0	0	-1
normalized size	1	1.00	0.80	3.04	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.174	0.100	1.117	0.000	0.541	0.000	0.000	0.000

Problem 582	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	53	212	0	0	0	0	-1
normalized size	1	1.00	0.77	3.07	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.205	0.110	0.641	0.000	0.429	0.000	0.000	0.000

Problem 583	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	130	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.506	2.053	1.008	0.000	0.597	0.000	0.000	0.000

Problem 584	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	94	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.425	3.701	1.068	0.000	0.570	0.000	0.000	0.000

Problem 585	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	160	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.740	6.248	1.816	0.000	0.461	0.000	0.000	0.000

Problem 586	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	135	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.665	7.007	4.266	0.000	0.440	0.000	0.000	0.000

Problem 587	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	177	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.912	12.609	5.701	0.000	0.423	0.000	0.000	0.000

Problem 588	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	174	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	1.081	11.672	4.047	0.000	0.404	0.000	0.000	0.000

Problem 589	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	82	582	0	0	0	0	-1
normalized size	1	1.00	0.69	4.93	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.403	0.226	3.064	0.000	0.407	0.000	0.000	0.000

Problem 590	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	142	142	99	586	0	0	0	0	-1
normalized size	1	1.00	0.70	4.13	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.581	0.290	4.126	0.000	0.416	0.000	0.000	0.000

Problem 591	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	116	116	95	601	0	0	0	0	-1
normalized size	1	1.00	0.82	5.18	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.501	0.200	1.220	0.000	0.461	0.000	0.000	0.000

Problem 592	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	84	586	0	0	0	0	-1
normalized size	1	1.00	0.73	5.10	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.245	0.117	0.766	0.000	0.485	0.000	0.000	0.000

Problem 593	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	199	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	1.137	2.472	1.106	0.000	0.537	0.000	0.000	0.000

Problem 594	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	164	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.804	4.400	1.116	0.000	0.506	0.000	0.000	0.000

Problem 595	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	238	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.048	7.951	1.968	0.000	0.425	0.000	0.000	0.000

Problem 596	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	209	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.607	7.484	3.883	0.000	0.441	0.000	0.000	0.000

Problem 597	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	33	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.100	31.574	1.404	0.000	0.439	0.000	0.000	0.000

Problem 598	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.055	0.836	1.663	0.000	0.422	0.000	0.000	0.000

Problem 599	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.055	0.910	1.509	0.000	0.530	0.000	0.000	0.000

Problem 600	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	0.596	1.328	0.000	0.533	0.000	0.000	0.000

Problem 601	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.085	0.547	0.545	0.000	0.481	0.000	0.000	0.000

Problem 602	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.680	1.580	0.000	0.416	0.000	0.000	0.000

Problem 603	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.704	1.711	0.000	0.407	0.000	0.000	0.000

Problem 604	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.112	1.678	1.098	0.000	0.401	0.000	0.000	0.000

Problem 605	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.114	1.337	1.044	0.000	0.457	0.000	0.000	0.000

Problem 606	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.096	0.372	1.116	0.000	0.463	0.000	0.000	0.000

Problem 607	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.105	0.693	1.527	0.000	0.491	0.000	0.000	0.000

Problem 608	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.119	0.762	1.732	0.000	0.479	0.000	0.000	0.000

Problem 609	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.118	0.827	1.707	0.000	0.438	0.000	0.000	0.000

Problem 610	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	21	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.024	1.182	1.695	0.000	0.449	0.000	0.000	0.000

Problem 611	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	20	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.013	1.265	1.462	0.000	0.461	0.000	0.000	0.000

Problem 612	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	1.622	2.316	0.000	0.435	0.000	0.000	0.000

Problem 613	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	1.056	1.954	0.000	0.468	0.000	0.000	0.000

Problem 614	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.022	0.752	1.686	0.000	0.398	0.000	0.000	0.000

Problem 615	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.048	1.341	1.885	0.000	0.387	0.000	0.000	0.000

Problem 616	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	1.103	2.315	0.000	0.402	0.000	0.000	0.000

Problem 617	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.022	1.251	2.044	0.000	0.391	0.000	0.000	0.000

Problem 618	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.049	1.318	2.214	0.000	0.390	0.000	0.000	0.000

Problem 619	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	43	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.096	0.931	1.940	0.000	0.403	0.000	0.000	0.000

Problem 620	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	38	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.075	0.624	0.882	0.000	0.395	0.000	0.000	0.000

Problem 621	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.049	0.480	0.283	0.000	0.404	0.000	0.000	0.000

Problem 622	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	14	14	0	0	14
normalized size	1	1.00	1.00	0.94	0.88	0.88	0.00	0.00	0.88
time (sec)	N/A	0.025	0.004	0.064	0.433	0.379	0.000	0.000	0.352

Problem 623	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	43	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.077	0.479	0.263	0.000	0.387	0.000	0.000	0.000

Problem 624	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.082	1.141	0.865	0.000	0.391	0.000	0.000	0.000

Problem 625	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	43	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.081	1.360	2.562	0.000	0.408	0.000	0.000	0.000

Problem 626	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.082	2.532	2.104	0.000	0.389	0.000	0.000	0.000

Problem 627	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	116	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.244	10.476	0.852	0.000	0.398	0.000	0.000	0.000

Problem 628	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	51	52	0	132	0	0	-1
normalized size	1	1.00	0.72	0.73	0.00	1.86	0.00	0.00	-0.01
time (sec)	N/A	0.288	0.118	0.266	0.000	0.493	0.000	0.000	0.000

Problem 629	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	70	51	0	135	0	0	-1
normalized size	1	1.00	0.86	0.63	0.00	1.67	0.00	0.00	-0.01
time (sec)	N/A	0.119	0.060	0.268	0.000	0.405	0.000	0.000	0.000

Problem 630	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	65	65	58	52	0	122	0	0	-1
normalized size	1	1.00	0.89	0.80	0.00	1.88	0.00	0.00	-0.02
time (sec)	N/A	0.246	0.072	0.235	0.000	0.415	0.000	0.000	0.000

Problem 631	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	114	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.260	1.937	0.820	0.000	1.081	0.000	0.000	0.000

Problem 632	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	104	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.390	2.818	0.924	0.000	0.495	0.000	0.000	0.000

Problem 633	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	161	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.408	2.303	2.687	0.000	0.590	0.000	0.000	0.000

Problem 634	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	143	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.547	7.120	1.944	0.000	0.578	0.000	0.000	0.000

Problem 635	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	72	90	0	328	0	0	-1
normalized size	1	1.00	0.41	0.51	0.00	1.85	0.00	0.00	-0.01
time (sec)	N/A	0.642	0.255	0.233	0.000	0.418	0.000	0.000	0.000

Problem 636	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	120	120	60	52	0	215	0	0	-1
normalized size	1	1.00	0.50	0.43	0.00	1.79	0.00	0.00	-0.01
time (sec)	N/A	0.596	0.150	0.233	0.000	0.521	0.000	0.000	0.000

Problem 637	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	113	113	98	88	0	314	0	0	-1
normalized size	1	1.00	0.87	0.78	0.00	2.78	0.00	0.00	-0.01
time (sec)	N/A	0.449	0.186	0.247	0.000	0.430	0.000	0.000	0.000

Problem 638	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F	C	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	89	89	0	297	0	0	-1
normalized size	1	1.00	1.10	1.10	0.00	3.67	0.00	0.00	-0.01
time (sec)	N/A	0.266	0.106	0.292	0.000	0.460	0.000	0.000	0.000

Problem 639	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	200	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.765	2.833	1.603	0.000	0.434	0.000	0.000	0.000

Problem 640	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	168	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.733	4.033	1.099	0.000	0.414	0.000	0.000	0.000

Problem 641	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	248	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.281	5.287	4.448	0.000	0.401	0.000	0.000	0.000

Problem 642	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	208	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.403	9.948	2.513	0.000	0.627	0.000	0.000	0.000

Problem 643	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	A	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	0	14	14	0	0	14
normalized size	1	1.00	1.00	0.00	0.88	0.88	0.00	0.00	0.88
time (sec)	N/A	0.091	0.155	2.444	0.479	0.453	0.000	0.000	0.430

Problem 644	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	1.935	1.751	0.000	0.464	0.000	0.000	0.000

Problem 645	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	1.117	1.405	0.000	0.427	0.000	0.000	0.000

Problem 646	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.115	3.609	1.854	0.000	0.397	0.000	0.000	0.000

Problem 647	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.080	6.605	2.012	0.000	0.393	0.000	0.000	0.000

Problem 648	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	1.144	1.629	0.000	0.387	0.000	0.000	0.000

Problem 649	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.113	4.457	1.922	0.000	0.583	0.000	0.000	0.000

Problem 650	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.099	2.307	2.159	0.000	1.316	0.000	0.000	0.000

Problem 651	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.047	1.278	1.575	0.000	1.580	0.000	0.000	0.000

Problem 652	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.126	2.779	1.857	0.000	1.398	0.000	0.000	0.000

Problem 653	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.082	1.392	1.506	0.000	1.097	0.000	0.000	0.000

Problem 654	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	0.740	0.930	0.000	0.507	0.000	0.000	0.000

Problem 655	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	68	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.216	7.518	1.054	0.000	0.859	0.000	0.000	0.000

Problem 656	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.108	5.449	1.048	0.000	0.569	0.000	0.000	0.000

Problem 657	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.111	6.847	2.064	0.000	0.437	0.000	0.000	0.000

Problem 658	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	136	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.507	2.465	3.495	0.000	0.436	0.000	0.000	0.000

Problem 659	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	135	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.412	2.228	3.449	0.000	0.425	0.000	0.000	0.000

Problem 660	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	104	104	63	313	0	0	0	0	-1
normalized size	1	1.00	0.61	3.01	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.322	0.133	1.174	0.000	0.463	0.000	0.000	0.000

Problem 661	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	65	292	0	0	0	0	-1
normalized size	1	1.00	0.64	2.89	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.224	0.082	0.648	0.000	0.469	0.000	0.000	0.000

Problem 662	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	166	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.630	2.611	1.036	0.000	0.461	0.000	0.000	0.000

Problem 663	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	131	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.462	2.602	1.176	0.000	0.524	0.000	0.000	0.000

Problem 664	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	201	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.878	3.329	2.260	0.000	0.454	0.000	0.000	0.000

Problem 665	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	170	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.684	8.131	4.023	0.000	0.536	0.000	0.000	0.000

Problem 666	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	241	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.358	8.153	6.644	0.000	0.445	0.000	0.000	0.000

Problem 667	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	235	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.443	7.673	4.834	0.000	0.480	0.000	0.000	0.000

Problem 668	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	114	848	0	0	0	0	-1
normalized size	1	1.00	0.63	4.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.715	0.330	3.612	0.000	0.439	0.000	0.000	0.000

Problem 669	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	209	209	119	844	0	0	0	0	-1
normalized size	1	1.00	0.57	4.04	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.907	0.239	3.333	0.000	0.414	0.000	0.000	0.000

Problem 670	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	175	175	118	867	0	0	0	0	-1
normalized size	1	1.00	0.67	4.95	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.931	0.295	1.300	0.000	0.489	0.000	0.000	0.000

Problem 671	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	145	145	102	844	0	0	0	0	-1
normalized size	1	1.00	0.70	5.82	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.551	0.221	0.790	0.000	0.500	0.000	0.000	0.000

Problem 672	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	263	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.720	3.800	1.156	0.000	0.452	0.000	0.000	0.000

Problem 673	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	232	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.152	5.569	1.194	0.000	0.563	0.000	0.000	0.000

Problem 674	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	0.864	1.821	0.000	0.651	0.000	0.000	0.000

Problem 675	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	0.958	1.775	0.000	0.639	0.000	0.000	0.000

Problem 676	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-1)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	0.629	1.503	0.000	0.467	0.000	0.000	0.000

Problem 677	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	46	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.082	0.883	0.523	0.000	0.513	0.000	0.000	0.000

Problem 678	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	1.003	1.567	0.000	0.614	0.000	0.000	0.000

Problem 679	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	1.037	1.926	0.000	0.444	0.000	0.000	0.000

Problem 680	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.114	1.667	1.326	0.000	0.800	0.000	0.000	0.000

Problem 681	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.113	1.369	1.264	0.000	0.485	0.000	0.000	0.000

Problem 682	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.117	0.729	1.438	0.000	0.447	0.000	0.000	0.000

Problem 683	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.104	1.039	1.823	0.000	0.578	0.000	0.000	0.000

Problem 684	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.116	1.104	2.174	0.000	0.577	0.000	0.000	0.000

Problem 685	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.117	1.163	2.085	0.000	0.451	0.000	0.000	0.000

Problem 686	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	2.180	4.569	0.000	0.437	0.000	0.000	0.000

Problem 687	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	57	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.046	2.487	2.002	0.000	0.000	0.000	0.000	0.000

Problem 688	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.013	3.429	1.621	0.000	0.000	0.000	0.000	0.000

Problem 689	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.040	1.732	2.842	0.000	0.000	0.000	0.000	0.000

Problem 690	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.085	1.345	4.505	0.000	0.479	0.000	0.000	0.000

Problem 691	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.072	1.967	2.433	0.000	0.000	0.000	0.000	0.000

Problem 692	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.023	1.846	2.689	0.000	0.000	0.000	0.000	0.000

Problem 693	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.061	1.379	3.185	0.000	0.000	0.000	0.000	0.000

Problem 694	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.058	0.893	5.605	0.000	0.441	0.000	0.000	0.000

Problem 695	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.064	1.955	3.145	0.000	0.000	0.000	0.000	0.000

Problem 696	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.024	1.885	2.754	0.000	0.000	0.000	0.000	0.000

Problem 697	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.052	1.410	3.967	0.000	0.000	0.000	0.000	0.000

Problem 698	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	0.827	1.298	0.000	0.563	0.000	0.000	0.000

Problem 699	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.122	2.868	3.701	0.000	0.000	0.000	0.000	0.000

Problem 700	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.098	1.230	1.596	0.000	0.000	0.000	0.000	0.000

Problem 701	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.049	1.040	0.429	0.000	0.000	0.000	0.000	0.000

Problem 702	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	0	14	0	14	14
normalized size	1	1.00	1.00	0.83	0.00	0.78	0.00	0.78	0.78
time (sec)	N/A	0.024	0.003	0.166	0.000	0.397	0.000	0.121	0.377

Problem 703	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	49	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.107	0.630	0.595	0.000	0.000	0.000	0.000	0.000

Problem 704	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.104	1.599	1.266	0.000	0.000	0.000	0.000	0.000

Problem 705	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	74	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.194	2.310	5.982	0.000	0.000	0.000	0.000	0.000

Problem 706	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.187	6.506	3.789	0.000	0.000	0.000	0.000	0.000

Problem 707	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	1.756	3.033	0.000	0.438	0.000	0.000	0.000

Problem 708	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	3.913	2.362	0.000	0.000	0.000	0.000	0.000

Problem 709	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	80	80	66	60	0	0	0	0	-1
normalized size	1	1.00	0.82	0.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.147	0.210	0.507	0.000	0.000	0.000	0.000	0.000

Problem 710	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	79	79	136	46	0	0	0	0	-1
normalized size	1	1.00	1.72	0.58	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.121	0.278	0.392	0.000	0.000	0.000	0.000	0.000

Problem 711	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	89	60	0	0	0	0	-1
normalized size	1	1.00	1.16	0.78	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.104	0.172	0.572	0.000	0.000	0.000	0.000	0.000

Problem 712	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.060	1.843	3.160	0.000	0.000	0.000	0.000	0.000

Problem 713	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.065	2.195	4.287	0.000	0.468	0.000	0.000	0.000

Problem 714	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.066	5.455	4.191	0.000	0.000	0.000	0.000	0.000

Problem 715	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	181	102	0	0	0	0	-1
normalized size	1	1.00	1.30	0.73	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.179	0.534	0.703	0.000	0.000	0.000	0.000	0.000

Problem 716	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	230	94	0	0	0	0	-1
normalized size	1	1.00	1.95	0.80	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.215	0.707	0.490	0.000	0.000	0.000	0.000	0.000

Problem 717	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	141	66	0	0	0	0	-1
normalized size	1	1.00	1.70	0.80	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.136	0.423	0.626	0.000	0.000	0.000	0.000	0.000

Problem 718	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	118	118	230	94	0	0	0	0	-1
normalized size	1	1.00	1.95	0.80	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.150	0.689	0.517	0.000	0.000	0.000	0.000	0.000

Problem 719	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	103	102	0	0	0	0	-1
normalized size	1	1.00	0.74	0.73	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.145	0.462	0.660	0.000	0.000	0.000	0.000	0.000

Problem 720	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.062	2.461	5.487	0.000	0.000	0.000	0.000	0.000

Problem 721	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.101	1.044	3.652	0.000	0.454	0.000	0.000	0.000

Problem 722	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.103	3.769	4.554	0.000	0.000	0.000	0.000	0.000

Problem 723	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	66	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.104	7.378	3.383	0.000	0.000	0.000	0.000	0.000

Problem 724	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	0.731	1.657	0.000	0.000	0.000	0.000	0.000

Problem 725	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	1.079	3.321	0.000	0.627	0.000	0.000	0.000

Problem 726	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.124	4.034	4.586	0.000	0.000	0.000	0.000	0.000

Problem 727	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	66	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.122	8.116	3.154	0.000	0.000	0.000	0.000	0.000

Problem 728	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	1.766	1.588	0.000	0.000	0.000	0.000	0.000

Problem 729	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	1.476	3.422	0.000	0.455	0.000	0.000	0.000

Problem 730	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.121	3.556	4.849	0.000	0.000	0.000	0.000	0.000

Problem 731	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	66	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.117	7.837	3.299	0.000	0.000	0.000	0.000	0.000

Problem 732	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	0.514	1.834	0.000	0.000	0.000	0.000	0.000

Problem 733	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.105	0.940	3.615	0.000	0.615	0.000	0.000	0.000

Problem 734	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	137	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.332	4.500	10.347	0.000	0.000	0.000	0.000	0.000

Problem 735	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	101	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.216	2.755	10.028	0.000	0.000	0.000	0.000	0.000

Problem 736	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.109	0.885	3.768	0.000	0.000	0.000	0.000	0.000

Problem 737	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	0.224	1.534	0.000	0.000	0.000	0.000	0.000

Problem 738	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.107	1.219	1.727	0.000	0.000	0.000	0.000	0.000

Problem 739	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	65	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.214	1.897	1.979	0.000	0.000	0.000	0.000	0.000

Problem 740	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	103	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.329	3.741	5.081	0.000	0.000	0.000	0.000	0.000

Problem 741	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	138	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.424	21.006	8.637	0.000	0.000	0.000	0.000	0.000

Problem 742	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.115	1.117	3.365	0.000	0.502	0.000	0.000	0.000

Problem 743	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.124	27.034	10.059	0.000	0.000	0.000	0.000	0.000

Problem 744	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.117	3.674	10.100	0.000	0.000	0.000	0.000	0.000

Problem 745	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	121	0	0	0	0	0	-1
normalized size	1	1.00	1.30	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.182	0.163	3.644	0.000	0.000	0.000	0.000	0.000

Problem 746	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	94	0	0	0	0	0	-1
normalized size	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.111	0.152	1.538	0.000	0.000	0.000	0.000	0.000

Problem 747	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.116	2.039	1.839	0.000	0.000	0.000	0.000	0.000

Problem 748	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.118	6.006	2.191	0.000	0.000	0.000	0.000	0.000

Problem 749	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	1.837	3.614	0.000	0.536	0.000	0.000	0.000

Problem 750	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.122	3.919	11.629	0.000	0.000	0.000	0.000	0.000

Problem 751	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	215	215	324	0	0	0	0	0	-1
normalized size	1	1.00	1.51	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.347	0.528	9.937	0.000	0.000	0.000	0.000	0.000

Problem 752	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	133	0	0	0	0	0	-1
normalized size	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.425	0.269	9.891	0.000	0.000	0.000	0.000	0.000

Problem 753	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	163	163	167	0	0	0	0	0	-1
normalized size	1	1.00	1.02	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.250	0.439	3.567	0.000	0.000	0.000	0.000	0.000

Problem 754	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	213	213	137	0	0	0	0	0	-1
normalized size	1	1.00	0.64	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.188	0.169	1.613	0.000	0.000	0.000	0.000	0.000

Problem 755	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.121	2.324	1.894	0.000	0.000	0.000	0.000	0.000

Problem 756	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	2.043	4.495	0.000	0.499	0.000	0.000	0.000

Problem 757	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	4.345	3.761	0.000	0.000	0.000	0.000	0.000

Problem 758	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	57	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.038	1.362	2.189	0.000	0.000	0.000	0.000	0.000

Problem 759	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.024	4.301	1.796	0.000	0.000	0.000	0.000	0.000

Problem 760	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	1.887	3.114	0.000	0.000	0.000	0.000	0.000

Problem 761	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	1.730	1.116	0.000	0.000	0.000	0.000	0.000

Problem 762	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	1.384	4.754	0.000	0.492	0.000	0.000	0.000

Problem 763	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	3.312	4.524	0.000	0.000	0.000	0.000	0.000

Problem 764	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.062	1.396	2.482	0.000	0.000	0.000	0.000	0.000

Problem 765	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	172	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.066	2.324	2.150	0.000	0.000	0.000	0.000	0.000

Problem 766	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.050	1.856	3.130	0.000	0.000	0.000	0.000	0.000

Problem 767	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	2.277	2.869	0.000	0.000	0.000	0.000	0.000

Problem 768	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.057	0.908	5.405	0.000	0.496	0.000	0.000	0.000

Problem 769	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.057	3.117	5.713	0.000	0.000	0.000	0.000	0.000

Problem 770	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.062	1.462	3.303	0.000	0.000	0.000	0.000	0.000

Problem 771	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	259	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.124	2.415	2.797	0.000	0.000	0.000	0.000	0.000

Problem 772	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.052	1.805	4.036	0.000	0.000	0.000	0.000	0.000

Problem 773	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.057	2.777	3.298	0.000	0.000	0.000	0.000	0.000

Problem 774	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.749	1.402	0.000	0.470	0.000	0.000	0.000

Problem 775	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.123	4.245	3.566	0.000	0.000	0.000	0.000	0.000

Problem 776	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.096	1.312	1.346	0.000	0.000	0.000	0.000	0.000

Problem 777	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.048	1.215	0.402	0.000	0.000	0.000	0.000	0.000

Problem 778	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	0	14	0	14	14
normalized size	1	1.00	1.00	0.83	0.00	0.78	0.00	0.78	0.78
time (sec)	N/A	0.025	0.003	0.139	0.000	0.428	0.000	0.130	0.387

Problem 779	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	49	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.108	0.665	0.549	0.000	0.000	0.000	0.000	0.000

Problem 780	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.102	1.373	1.280	0.000	0.000	0.000	0.000	0.000

Problem 781	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	74	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.192	1.927	5.788	0.000	0.000	0.000	0.000	0.000

Problem 782	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.186	4.036	3.510	0.000	0.000	0.000	0.000	0.000

Problem 783	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	1.450	2.879	0.000	0.580	0.000	0.000	0.000

Problem 784	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	4.103	2.354	0.000	0.000	0.000	0.000	0.000

Problem 785	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	127	127	187	75	0	0	0	0	-1
normalized size	1	1.00	1.47	0.59	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.188	0.391	0.487	0.000	0.000	0.000	0.000	0.000

Problem 786	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	75	67	0	0	0	0	-1
normalized size	1	1.00	0.69	0.61	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.152	0.100	0.313	0.000	0.000	0.000	0.000	0.000

Problem 787	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	90	75	0	0	0	0	-1
normalized size	1	1.00	0.73	0.60	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.148	0.177	0.530	0.000	0.000	0.000	0.000	0.000

Problem 788	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.059	1.932	2.603	0.000	0.000	0.000	0.000	0.000

Problem 789	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	1.866	3.486	0.000	0.470	0.000	0.000	0.000

Problem 790	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	6.959	3.462	0.000	0.000	0.000	0.000	0.000

Problem 791	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	230	230	355	132	0	0	0	0	-1
normalized size	1	1.00	1.54	0.57	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.411	0.862	0.710	0.000	0.000	0.000	0.000	0.000

Problem 792	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	350	124	0	0	0	0	-1
normalized size	1	1.00	2.08	0.74	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.247	0.315	0.565	0.000	0.000	0.000	0.000	0.000

Problem 793	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	108	108	353	81	0	0	0	0	-1
normalized size	1	1.00	3.27	0.75	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.163	0.821	0.502	0.000	0.000	0.000	0.000	0.000

Problem 794	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	168	168	347	124	0	0	0	0	-1
normalized size	1	1.00	2.07	0.74	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.186	0.255	0.457	0.000	0.000	0.000	0.000	0.000

Problem 795	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	219	219	142	132	0	0	0	0	-1
normalized size	1	1.00	0.65	0.60	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.291	0.389	0.766	0.000	0.000	0.000	0.000	0.000

Problem 796	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.061	2.578	4.676	0.000	0.000	0.000	0.000	0.000

Problem 797	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.098	0.727	3.084	0.000	0.599	0.000	0.000	0.000

Problem 798	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.101	3.164	3.964	0.000	0.000	0.000	0.000	0.000

Problem 799	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	66	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.106	6.628	2.964	0.000	0.000	0.000	0.000	0.000

Problem 800	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	119	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.105	0.311	1.424	0.000	0.000	0.000	0.000	0.000

Problem 801	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.097	3.359	1.720	0.000	0.000	0.000	0.000	0.000

Problem 802	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.110	1.107	2.888	0.000	0.475	0.000	0.000	0.000

Problem 803	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.115	3.900	3.846	0.000	0.000	0.000	0.000	0.000

Problem 804	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	66	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.118	2.559	2.703	0.000	0.000	0.000	0.000	0.000

Problem 805	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	212	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.178	1.494	1.505	0.000	0.000	0.000	0.000	0.000

Problem 806	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.113	2.251	1.714	0.000	0.000	0.000	0.000	0.000

Problem 807	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.113	1.401	2.939	0.000	0.794	0.000	0.000	0.000

Problem 808	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	3.307	4.241	0.000	0.000	0.000	0.000	0.000

Problem 809	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	66	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.116	7.352	2.979	0.000	0.000	0.000	0.000	0.000

Problem 810	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	307	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.274	0.495	1.592	0.000	0.000	0.000	0.000	0.000

Problem 811	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.112	2.354	1.862	0.000	0.000	0.000	0.000	0.000

Problem 812	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.102	0.880	3.180	0.000	0.989	0.000	0.000	0.000

Problem 813	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	168	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.450	3.735	9.118	0.000	0.000	0.000	0.000	0.000

Problem 814	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	132	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.259	2.472	8.597	0.000	0.000	0.000	0.000	0.000

Problem 815	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.108	0.693	3.366	0.000	0.000	0.000	0.000	0.000

Problem 816	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.218	1.315	0.000	0.000	0.000	0.000	0.000

Problem 817	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.105	1.329	1.620	0.000	0.000	0.000	0.000	0.000

Problem 818	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	65	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.213	1.349	1.964	0.000	0.000	0.000	0.000	0.000

Problem 819	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	138	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.423	4.203	4.767	0.000	0.000	0.000	0.000	0.000

Problem 820	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	173	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.656	19.239	8.197	0.000	0.000	0.000	0.000	0.000

Problem 821	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.115	1.002	2.743	0.000	0.925	0.000	0.000	0.000

Problem 822	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.135	8.378	8.815	0.000	0.000	0.000	0.000	0.000

Problem 823	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.152	3.704	8.642	0.000	0.000	0.000	0.000	0.000

Problem 824	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	128	0	0	0	0	0	-1
normalized size	1	1.00	0.99	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.211	0.175	3.104	0.000	0.000	0.000	0.000	0.000

Problem 825	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	104	0	0	0	0	0	-1
normalized size	1	1.00	0.83	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.142	0.171	1.424	0.000	0.000	0.000	0.000	0.000

Problem 826	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.117	2.298	1.643	0.000	0.000	0.000	0.000	0.000

Problem 827	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.118	7.536	1.874	0.000	0.000	0.000	0.000	0.000

Problem 828	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.118	1.489	3.149	0.000	0.545	0.000	0.000	0.000

Problem 829	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.124	9.312	18.467	0.000	0.000	0.000	0.000	0.000

Problem 830	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.123	3.878	10.702	0.000	0.000	0.000	0.000	0.000

Problem 831	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	263	263	272	0	0	0	0	0	-1
normalized size	1	1.00	1.03	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.641	1.095	8.963	0.000	0.000	0.000	0.000	0.000

Problem 832	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	247	247	338	0	0	0	0	0	-1
normalized size	1	1.00	1.37	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.476	0.575	8.990	0.000	0.000	0.000	0.000	0.000

Problem 833	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	248	248	261	0	0	0	0	0	-1
normalized size	1	1.00	1.05	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.281	1.051	3.164	0.000	0.000	0.000	0.000	0.000

Problem 834	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	252	252	153	0	0	0	0	0	-1
normalized size	1	1.00	0.61	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.349	0.212	1.556	0.000	0.000	0.000	0.000	0.000

Problem 835	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.116	2.506	1.731	0.000	0.000	0.000	0.000	0.000

Problem 836	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.117	8.657	1.899	0.000	0.000	0.000	0.000	0.000

Problem 837	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	2.038	3.885	0.000	0.464	0.000	0.000	0.000

Problem 838	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	3.691	3.271	0.000	0.000	0.000	0.000	0.000

Problem 839	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	117	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.055	2.095	1.773	0.000	0.000	0.000	0.000	0.000

Problem 840	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.025	3.989	1.599	0.000	0.000	0.000	0.000	0.000

Problem 841	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	3.173	2.838	0.000	0.000	0.000	0.000	0.000

Problem 842	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.033	1.805	0.954	0.000	0.000	0.000	0.000	0.000

Problem 843	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	1.419	4.288	0.000	0.571	0.000	0.000	0.000

Problem 844	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	2.744	3.999	0.000	0.000	0.000	0.000	0.000

Problem 845	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	216	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.114	1.571	2.353	0.000	0.000	0.000	0.000	0.000

Problem 846	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	172	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.070	2.420	1.991	0.000	0.000	0.000	0.000	0.000

Problem 847	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.048	1.982	2.843	0.000	0.000	0.000	0.000	0.000

Problem 848	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	2.777	2.505	0.000	0.000	0.000	0.000	0.000

Problem 849	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.055	0.942	4.763	0.000	0.530	0.000	0.000	0.000

Problem 850	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	2.638	4.802	0.000	0.000	0.000	0.000	0.000

Problem 851	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	309	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.187	1.646	2.949	0.000	0.000	0.000	0.000	0.000

Problem 852	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	259	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.126	2.405	2.546	0.000	0.000	0.000	0.000	0.000

Problem 853	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.050	1.655	3.458	0.000	0.000	0.000	0.000	0.000

Problem 854	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	2.818	2.987	0.000	0.000	0.000	0.000	0.000

Problem 855	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	0.738	1.294	0.000	0.478	0.000	0.000	0.000

Problem 856	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.120	4.560	3.207	0.000	0.000	0.000	0.000	0.000

Problem 857	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.091	1.317	1.142	0.000	0.000	0.000	0.000	0.000

Problem 858	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.054	1.223	0.397	0.000	0.000	0.000	0.000	0.000

Problem 859	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	0	14	0	14	14
normalized size	1	1.00	1.00	0.83	0.00	0.78	0.00	0.78	0.78
time (sec)	N/A	0.025	0.004	0.126	0.000	0.472	0.000	0.131	0.395

Problem 860	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	49	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.115	0.658	0.466	0.000	0.000	0.000	0.000	0.000

Problem 861	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	36	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.104	1.393	1.178	0.000	0.000	0.000	0.000	0.000

Problem 862	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	74	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.187	2.166	5.168	0.000	0.000	0.000	0.000	0.000

Problem 863	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	61	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.179	3.799	3.168	0.000	0.000	0.000	0.000	0.000

Problem 864	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	1.430	2.620	0.000	0.433	0.000	0.000	0.000

Problem 865	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.066	4.501	2.132	0.000	0.000	0.000	0.000	0.000

Problem 866	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	111	102	0	0	0	0	-1
normalized size	1	1.00	0.71	0.65	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.224	0.207	0.487	0.000	0.000	0.000	0.000	0.000

Problem 867	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	156	156	234	88	0	0	0	0	-1
normalized size	1	1.00	1.50	0.56	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	0.179	0.338	0.000	0.000	0.000	0.000	0.000

Problem 868	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	151	151	85	102	0	0	0	0	-1
normalized size	1	1.00	0.56	0.68	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.184	0.282	0.503	0.000	0.000	0.000	0.000	0.000

Problem 869	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.059	2.125	2.650	0.000	0.000	0.000	0.000	0.000

Problem 870	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	1.966	3.506	0.000	0.447	0.000	0.000	0.000

Problem 871	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.062	8.424	3.465	0.000	0.000	0.000	0.000	0.000

Problem 872	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	310	310	287	194	0	0	0	0	-1
normalized size	1	1.00	0.93	0.63	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.486	0.653	0.686	0.000	0.000	0.000	0.000	0.000

Problem 873	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	256	256	359	180	0	0	0	0	-1
normalized size	1	1.00	1.40	0.70	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.492	0.760	0.570	0.000	0.000	0.000	0.000	0.000

Problem 874	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	133	133	185	96	0	0	0	0	-1
normalized size	1	1.00	1.39	0.72	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.175	0.477	0.579	0.000	0.000	0.000	0.000	0.000

Problem 875	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	254	254	359	180	0	0	0	0	-1
normalized size	1	1.00	1.41	0.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.338	0.697	0.530	0.000	0.000	0.000	0.000	0.000

Problem 876	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	296	296	162	194	0	0	0	0	-1
normalized size	1	1.00	0.55	0.66	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.369	0.381	0.721	0.000	0.000	0.000	0.000	0.000

Problem 877	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.057	3.440	4.901	0.000	0.000	0.000	0.000	0.000

Problem 878	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.095	0.712	3.102	0.000	0.491	0.000	0.000	0.000

Problem 879	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	3.355	4.040	0.000	0.000	0.000	0.000	0.000

Problem 880	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	160	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.179	5.087	2.820	0.000	0.000	0.000	0.000	0.000

Problem 881	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	119	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.103	0.486	1.519	0.000	0.000	0.000	0.000	0.000

Problem 882	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.094	2.464	1.770	0.000	0.000	0.000	0.000	0.000

Problem 883	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.107	1.113	2.905	0.000	0.467	0.000	0.000	0.000

Problem 884	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.116	4.045	4.106	0.000	0.000	0.000	0.000	0.000

Problem 885	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	259	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.272	2.825	2.810	0.000	0.000	0.000	0.000	0.000

Problem 886	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	212	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.179	1.589	1.501	0.000	0.000	0.000	0.000	0.000

Problem 887	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.108	2.226	1.850	0.000	0.000	0.000	0.000	0.000

Problem 888	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.108	1.483	3.004	0.000	0.581	0.000	0.000	0.000

Problem 889	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	3.484	4.221	0.000	0.000	0.000	0.000	0.000

Problem 890	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	360	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.364	6.051	2.977	0.000	0.000	0.000	0.000	0.000

Problem 891	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	307	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.267	0.499	1.618	0.000	0.000	0.000	0.000	0.000

Problem 892	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	2.482	1.839	0.000	0.000	0.000	0.000	0.000

Problem 893	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.102	0.846	2.999	0.000	0.501	0.000	0.000	0.000

Problem 894	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	199	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.472	4.075	9.252	0.000	0.000	0.000	0.000	0.000

Problem 895	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	132	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.254	2.601	8.686	0.000	0.000	0.000	0.000	0.000

Problem 896	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.109	0.696	3.229	0.000	0.000	0.000	0.000	0.000

Problem 897	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.227	1.375	0.000	0.000	0.000	0.000	0.000

Problem 898	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.103	1.322	1.661	0.000	0.000	0.000	0.000	0.000

Problem 899	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	65	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.210	1.453	1.627	0.000	0.000	0.000	0.000	0.000

Problem 900	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	138	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.423	4.765	4.427	0.000	0.000	0.000	0.000	0.000

Problem 901	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	208	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.744	17.024	7.523	0.000	0.000	0.000	0.000	0.000

Problem 902	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	0.977	2.923	0.000	0.432	0.000	0.000	0.000

Problem 903	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.122	3.672	8.872	0.000	0.000	0.000	0.000	0.000

Problem 904	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	139	0	0	0	0	0	-1
normalized size	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.227	0.189	3.013	0.000	0.000	0.000	0.000	0.000

Problem 905	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	97	0	0	0	0	0	-1
normalized size	1	1.00	0.63	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.158	0.100	1.359	0.000	0.000	0.000	0.000	0.000

Problem 906	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.119	2.304	1.470	0.000	0.000	0.000	0.000	0.000

Problem 907	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.117	1.489	2.911	0.000	0.431	0.000	0.000	0.000

Problem 908	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.119	4.137	10.175	0.000	0.000	0.000	0.000	0.000

Problem 909	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	350	350	370	0	0	0	0	0	-1
normalized size	1	1.00	1.06	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.708	0.570	8.893	0.000	0.000	0.000	0.000	0.000

Problem 910	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	295	295	287	0	0	0	0	0	-1
normalized size	1	1.00	0.97	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.775	1.133	8.793	0.000	0.000	0.000	0.000	0.000

Problem 911	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	356	0	0	0	0	0	-1
normalized size	1	1.00	1.22	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.451	0.537	3.083	0.000	0.000	0.000	0.000	0.000

Problem 912	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	337	337	176	0	0	0	0	0	-1
normalized size	1	1.00	0.52	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.414	0.282	1.470	0.000	0.000	0.000	0.000	0.000

Problem 913	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.119	2.650	1.568	0.000	0.000	0.000	0.000	0.000

Problem 914	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	2.110	3.392	0.000	0.417	0.000	0.000	0.000

Problem 915	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.023	1.071	1.691	0.000	0.000	0.000	0.000	0.000

Problem 916	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.012	0.113	1.408	0.000	0.000	0.000	0.000	0.000

Problem 917	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	1.510	2.935	0.000	0.000	0.000	0.000	0.000

Problem 918	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.055	1.385	3.779	0.000	0.461	0.000	0.000	0.000

Problem 919	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.039	1.280	2.076	0.000	0.000	0.000	0.000	0.000

Problem 920	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.022	0.781	1.965	0.000	0.000	0.000	0.000	0.000

Problem 921	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.050	1.416	2.862	0.000	0.000	0.000	0.000	0.000

Problem 922	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	0.838	4.689	0.000	0.520	0.000	0.000	0.000

Problem 923	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	1.305	2.813	0.000	0.000	0.000	0.000	0.000

Problem 924	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.022	0.794	2.434	0.000	0.000	0.000	0.000	0.000

Problem 925	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.052	1.447	3.263	0.000	0.000	0.000	0.000	0.000

Problem 926	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.068	0.643	0.951	0.000	0.560	0.000	0.000	0.000

Problem 927	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.049	0.892	0.352	0.000	0.000	0.000	0.000	0.000

Problem 928	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	0	14	0	14	14
normalized size	1	1.00	1.00	0.94	0.00	0.88	0.00	0.88	0.88
time (sec)	N/A	0.024	0.003	0.118	0.000	0.431	0.000	0.139	0.343

Problem 929	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.065	0.267	0.464	0.000	0.000	0.000	0.000	0.000

Problem 930	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	1.513	2.222	0.000	0.501	0.000	0.000	0.000

Problem 931	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.066	3.673	1.361	0.000	0.000	0.000	0.000	0.000

Problem 932	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	122	38	0	0	0	0	-1
normalized size	1	1.00	2.60	0.81	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.107	0.218	0.433	0.000	0.000	0.000	0.000	0.000

Problem 933	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	31	31	31	24	0	0	0	0	-1
normalized size	1	1.00	1.00	0.77	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.074	0.054	0.167	0.000	0.000	0.000	0.000	0.000

Problem 934	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	47	47	43	38	0	0	0	0	-1
normalized size	1	1.00	0.91	0.81	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.070	0.117	0.449	0.000	0.000	0.000	0.000	0.000

Problem 935	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.060	1.465	2.431	0.000	0.000	0.000	0.000	0.000

Problem 936	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.064	1.978	3.345	0.000	0.494	0.000	0.000	0.000

Problem 937	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	4.466	2.703	0.000	0.000	0.000	0.000	0.000

Problem 938	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	230	68	0	0	0	0	-1
normalized size	1	1.00	2.58	0.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.137	0.527	0.561	0.000	0.000	0.000	0.000	0.000

Problem 939	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	131	54	0	0	0	0	-1
normalized size	1	1.00	1.85	0.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.128	0.149	0.409	0.000	0.000	0.000	0.000	0.000

Problem 940	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	58	58	229	45	0	0	0	0	-1
normalized size	1	1.00	3.95	0.78	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.119	0.483	0.500	0.000	0.000	0.000	0.000	0.000

Problem 941	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	133	54	0	0	0	0	-1
normalized size	1	1.00	1.87	0.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.106	0.114	0.343	0.000	0.000	0.000	0.000	0.000

Problem 942	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	89	89	147	68	0	0	0	0	-1
normalized size	1	1.00	1.65	0.76	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.096	0.278	0.537	0.000	0.000	0.000	0.000	0.000

Problem 943	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.059	1.797	4.319	0.000	0.000	0.000	0.000	0.000

Problem 944	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.095	0.853	3.008	0.000	0.470	0.000	0.000	0.000

Problem 945	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	1.953	2.711	0.000	0.000	0.000	0.000	0.000

Problem 946	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	0.276	1.522	0.000	0.000	0.000	0.000	0.000

Problem 947	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.097	2.904	1.681	0.000	0.000	0.000	0.000	0.000

Problem 948	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	1.038	2.893	0.000	0.421	0.000	0.000	0.000

Problem 949	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.080	2.996	2.689	0.000	0.000	0.000	0.000	0.000

Problem 950	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	0.387	1.370	0.000	0.000	0.000	0.000	0.000

Problem 951	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.110	2.505	1.609	0.000	0.000	0.000	0.000	0.000

Problem 952	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.111	1.414	2.852	0.000	0.448	0.000	0.000	0.000

Problem 953	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.078	2.612	2.865	0.000	0.000	0.000	0.000	0.000

Problem 954	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	0.442	1.537	0.000	0.000	0.000	0.000	0.000

Problem 955	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.120	2.543	1.638	0.000	0.000	0.000	0.000	0.000

Problem 956	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.106	0.907	2.949	0.000	0.537	0.000	0.000	0.000

Problem 957	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.071	1.149	3.276	0.000	0.000	0.000	0.000	0.000

Problem 958	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.226	1.377	0.000	0.000	0.000	0.000	0.000

Problem 959	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.107	1.028	1.668	0.000	0.000	0.000	0.000	0.000

Problem 960	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.116	1.026	2.961	0.000	0.479	0.000	0.000	0.000

Problem 961	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.118	3.494	9.868	0.000	0.000	0.000	0.000	0.000

Problem 962	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	97	0	0	0	0	0	-1
normalized size	1	1.00	1.62	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.165	0.138	3.256	0.000	0.000	0.000	0.000	0.000

Problem 963	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	61	0	0	0	0	0	-1
normalized size	1	1.00	1.02	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.093	0.049	1.458	0.000	0.000	0.000	0.000	0.000

Problem 964	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.117	1.944	1.627	0.000	0.000	0.000	0.000	0.000

Problem 965	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.118	1.625	2.967	0.000	0.531	0.000	0.000	0.000

Problem 966	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.120	3.664	11.140	0.000	0.000	0.000	0.000	0.000

Problem 967	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	95	0	0	0	0	0	-1
normalized size	1	1.00	0.73	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.291	0.214	8.793	0.000	0.000	0.000	0.000	0.000

Problem 968	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	159	0	0	0	0	0	-1
normalized size	1	1.00	1.21	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.296	0.204	9.915	0.000	0.000	0.000	0.000	0.000

Problem 969	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	156	0	0	0	0	0	-1
normalized size	1	1.00	1.19	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.214	0.224	3.257	0.000	0.000	0.000	0.000	0.000

Problem 970	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	159	0	0	0	0	0	-1
normalized size	1	1.00	1.21	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.146	0.229	1.615	0.000	0.000	0.000	0.000	0.000

Problem 971	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.118	2.162	1.668	0.000	0.000	0.000	0.000	0.000

Problem 972	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	2.152	4.037	0.000	0.454	0.000	0.000	0.000

Problem 973	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.023	1.663	1.738	0.000	0.000	0.000	0.000	0.000

Problem 974	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.012	1.549	1.428	0.000	0.000	0.000	0.000	0.000

Problem 975	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	2.092	2.811	0.000	0.000	0.000	0.000	0.000

Problem 976	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.054	1.498	4.207	0.000	0.553	0.000	0.000	0.000

Problem 977	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	1.794	2.247	0.000	0.000	0.000	0.000	0.000

Problem 978	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.022	1.631	2.094	0.000	0.000	0.000	0.000	0.000

Problem 979	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.049	2.197	2.921	0.000	0.000	0.000	0.000	0.000

Problem 980	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	0.928	4.738	0.000	0.530	0.000	0.000	0.000

Problem 981	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	1.823	3.122	0.000	0.000	0.000	0.000	0.000

Problem 982	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.022	1.679	2.583	0.000	0.000	0.000	0.000	0.000

Problem 983	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.050	2.248	3.408	0.000	0.000	0.000	0.000	0.000

Problem 984	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	46	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.081	0.753	1.329	0.000	2.708	0.000	0.000	0.000

Problem 985	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	37	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.048	1.130	0.356	0.000	0.000	0.000	0.000	0.000

Problem 986	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	16	16	16	15	0	14	0	14	14
normalized size	1	1.00	1.00	0.94	0.00	0.88	0.00	0.88	0.88
time (sec)	N/A	0.025	0.005	0.118	0.000	0.665	0.000	4.012	0.328

Problem 987	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	43	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.076	0.214	0.426	0.000	0.000	0.000	0.000	0.000

Problem 988	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.062	1.185	2.605	0.000	0.505	0.000	0.000	0.000

Problem 989	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	4.388	2.446	0.000	0.000	0.000	0.000	0.000

Problem 990	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	106	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.246	4.486	1.612	0.000	0.000	0.000	0.000	0.000

Problem 991	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	60	60	60	46	0	0	0	0	-1
normalized size	1	1.00	1.00	0.77	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.145	0.188	0.381	0.000	0.000	0.000	0.000	0.000

Problem 992	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	138	138	158	47	0	0	0	0	-1
normalized size	1	1.00	1.14	0.34	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.170	0.191	0.270	0.000	0.000	0.000	0.000	0.000

Problem 993	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	52	47	0	0	0	0	-1
normalized size	1	1.00	0.91	0.82	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.104	0.169	0.540	0.000	0.000	0.000	0.000	0.000

Problem 994	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	4.770	2.577	0.000	0.000	0.000	0.000	0.000

Problem 995	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.193	4.755	2.120	0.000	0.000	0.000	0.000	0.000

Problem 996	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.199	7.041	5.431	0.000	0.000	0.000	0.000	0.000

Problem 997	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.201	7.271	3.658	0.000	0.000	0.000	0.000	0.000

Problem 998	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	1.438	3.411	0.000	0.433	0.000	0.000	0.000

Problem 999	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	96	96	148	86	0	0	0	0	-1
normalized size	1	1.00	1.54	0.90	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.334	0.375	0.504	0.000	0.000	0.000	0.000	0.000

Problem 1000	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	67	67	112	53	0	0	0	0	-1
normalized size	1	1.00	1.67	0.79	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.313	0.414	0.516	0.000	0.000	0.000	0.000	0.000

Problem 1001	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	156	84	0	0	0	0	-1
normalized size	1	1.00	1.68	0.90	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.271	0.257	0.439	0.000	0.000	0.000	0.000	0.000

Problem 1002	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	144	85	0	0	0	0	-1
normalized size	1	1.00	1.53	0.90	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.138	0.318	0.645	0.000	0.000	0.000	0.000	0.000

Problem 1003	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	140	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.233	5.348	4.595	0.000	0.000	0.000	0.000	0.000

Problem 1004	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.195	6.543	2.710	0.000	0.000	0.000	0.000	0.000

Problem 1005	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.217	7.686	9.060	0.000	0.000	0.000	0.000	0.000

Problem 1006	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	93	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.204	7.555	4.612	0.000	0.000	0.000	0.000	0.000

Problem 1007	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.098	0.732	3.360	0.000	0.435	0.000	0.000	0.000

Problem 1008	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.070	1.892	3.022	0.000	0.000	0.000	0.000	0.000

Problem 1009	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	0.462	1.417	0.000	0.000	0.000	0.000	0.000

Problem 1010	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.100	4.890	1.842	0.000	0.000	0.000	0.000	0.000

Problem 1011	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.112	1.118	3.021	0.000	0.438	0.000	0.000	0.000

Problem 1012	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.077	7.192	2.786	0.000	0.000	0.000	0.000	0.000

Problem 1013	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	1.416	1.500	0.000	0.000	0.000	0.000	0.000

Problem 1014	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.112	9.795	1.620	0.000	0.000	0.000	0.000	0.000

Problem 1015	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.112	1.488	2.934	0.000	0.436	0.000	0.000	0.000

Problem 1016	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.079	2.734	2.956	0.000	0.000	0.000	0.000	0.000

Problem 1017	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.038	1.169	1.608	0.000	0.000	0.000	0.000	0.000

Problem 1018	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.113	4.852	1.770	0.000	0.000	0.000	0.000	0.000

Problem 1019	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.108	0.899	3.139	0.000	0.443	0.000	0.000	0.000

Problem 1020	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.072	1.099	3.401	0.000	0.000	0.000	0.000	0.000

Problem 1021	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.035	0.667	1.339	0.000	0.000	0.000	0.000	0.000

Problem 1022	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	68	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.211	5.422	1.664	0.000	0.000	0.000	0.000	0.000

Problem 1023	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.105	10.872	1.787	0.000	0.000	0.000	0.000	0.000

Problem 1024	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.117	1.046	2.938	0.000	0.476	0.000	0.000	0.000

Problem 1025	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.373	5.961	9.269	0.000	0.000	0.000	0.000	0.000

Problem 1026	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	127	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.431	5.802	9.004	0.000	0.000	0.000	0.000	0.000

Problem 1027	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	93	93	116	0	0	0	0	0	-1
normalized size	1	1.00	1.25	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.178	0.158	3.327	0.000	0.000	0.000	0.000	0.000

Problem 1028	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	92	92	107	0	0	0	0	0	-1
normalized size	1	1.00	1.16	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.213	0.138	1.432	0.000	0.000	0.000	0.000	0.000

Problem 1029	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	126	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.332	4.917	1.678	0.000	0.000	0.000	0.000	0.000

Problem 1030	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.360	20.657	1.826	0.000	0.000	0.000	0.000	0.000

Problem 1031	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.365	17.232	3.948	0.000	0.000	0.000	0.000	0.000

Problem 1032	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.363	19.474	7.954	0.000	0.000	0.000	0.000	0.000

Problem 1033	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.115	1.157	3.070	0.000	0.453	0.000	0.000	0.000

Problem 1034	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	182	0	0	0	0	0	-1
normalized size	1	1.00	1.14	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.434	0.547	9.163	0.000	0.000	0.000	0.000	0.000

Problem 1035	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	281	281	241	0	0	0	0	0	-1
normalized size	1	1.00	0.86	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.666	0.531	9.169	0.000	0.000	0.000	0.000	0.000

Problem 1036	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	280	280	299	0	0	0	0	0	-1
normalized size	1	1.00	1.07	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.546	0.503	3.364	0.000	0.000	0.000	0.000	0.000

Problem 1037	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	157	157	158	0	0	0	0	0	-1
normalized size	1	1.00	1.01	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.265	0.403	1.654	0.000	0.000	0.000	0.000	0.000

Problem 1038	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	186	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.397	5.752	1.724	0.000	0.000	0.000	0.000	0.000

Problem 1039	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.369	15.633	1.907	0.000	0.000	0.000	0.000	0.000

Problem 1040	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.365	26.780	3.904	0.000	0.000	0.000	0.000	0.000

Problem 1041	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.369	22.265	7.942	0.000	0.000	0.000	0.000	0.000

Problem 1042	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	2.189	3.989	0.000	0.503	0.000	0.000	0.000

Problem 1043	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.023	2.799	1.729	0.000	0.000	0.000	0.000	0.000

Problem 1044	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	22	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.05
time (sec)	N/A	0.013	2.149	1.553	0.000	0.000	0.000	0.000	0.000

Problem 1045	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.032	5.980	3.021	0.000	0.000	0.000	0.000	0.000

Problem 1046	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	1.541	4.302	0.000	0.513	0.000	0.000	0.000

Problem 1047	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	2.170	2.251	0.000	0.000	0.000	0.000	0.000

Problem 1048	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.022	1.619	1.986	0.000	0.000	0.000	0.000	0.000

Problem 1049	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.050	3.240	2.740	0.000	0.000	0.000	0.000	0.000

Problem 1050	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.056	0.935	4.541	0.000	0.802	0.000	0.000	0.000

Problem 1051	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	25	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.037	2.234	2.844	0.000	0.000	0.000	0.000	0.000

Problem 1052	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	24	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.022	1.667	2.496	0.000	0.000	0.000	0.000	0.000

Problem 1053	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.051	4.071	3.411	0.000	0.000	0.000	0.000	0.000

Problem 1054	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	50	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.082	0.781	1.472	0.000	0.576	0.000	0.000	0.000

Problem 1055	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	41	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.049	1.552	0.374	0.000	0.000	0.000	0.000	0.000

Problem 1056	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	18	18	18	15	0	14	0	14	14
normalized size	1	1.00	1.00	0.83	0.00	0.78	0.00	0.78	0.78
time (sec)	N/A	0.024	0.006	0.168	0.000	0.488	0.000	0.144	0.332

Problem 1057	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	47	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.077	1.427	0.448	0.000	0.000	0.000	0.000	0.000

Problem 1058	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.063	1.242	2.708	0.000	0.493	0.000	0.000	0.000

Problem 1059	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	186	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.415	4.811	1.615	0.000	0.000	0.000	0.000	0.000

Problem 1060	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	180	180	162	62	0	0	0	0	-1
normalized size	1	1.00	0.90	0.34	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.263	0.366	0.475	0.000	0.000	0.000	0.000	0.000

Problem 1061	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	101	101	88	59	0	0	0	0	-1
normalized size	1	1.00	0.87	0.58	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.122	0.080	0.317	0.000	0.000	0.000	0.000	0.000

Problem 1062	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	174	174	170	62	0	0	0	0	-1
normalized size	1	1.00	0.98	0.36	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.206	0.438	0.473	0.000	0.000	0.000	0.000	0.000

Problem 1063	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	180	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.360	4.537	2.673	0.000	0.000	0.000	0.000	0.000

Problem 1064	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	198	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.483	6.878	2.402	0.000	0.000	0.000	0.000	0.000

Problem 1065	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	189	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.464	5.638	5.524	0.000	0.000	0.000	0.000	0.000

Problem 1066	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	189	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.471	11.365	3.868	0.000	0.000	0.000	0.000	0.000

Problem 1067	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.065	1.447	3.377	0.000	0.476	0.000	0.000	0.000

Problem 1068	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	227	112	0	0	0	0	-1
normalized size	1	1.00	1.42	0.70	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.590	0.470	0.551	0.000	0.000	0.000	0.000	0.000

Problem 1069	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	259	68	0	0	0	0	-1
normalized size	1	1.00	2.01	0.53	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.688	0.952	0.498	0.000	0.000	0.000	0.000	0.000

Problem 1070	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	155	155	220	110	0	0	0	0	-1
normalized size	1	1.00	1.42	0.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.500	0.398	0.456	0.000	0.000	0.000	0.000	0.000

Problem 1071	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F(-2)	F(-2)	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	125	125	186	113	0	0	0	0	-1
normalized size	1	1.00	1.49	0.90	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.297	0.724	0.696	0.000	0.000	0.000	0.000	0.000

Problem 1072	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	216	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.412	6.234	3.806	0.000	0.000	0.000	0.000	0.000

Problem 1073	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	231	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.508	8.468	2.766	0.000	0.000	0.000	0.000	0.000

Problem 1074	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	187	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.461	6.250	8.636	0.000	0.000	0.000	0.000	0.000

Problem 1075	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	191	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.469	13.236	4.392	0.000	0.000	0.000	0.000	0.000

Problem 1076	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.098	0.745	2.937	0.000	0.492	0.000	0.000	0.000

Problem 1077	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.067	2.713	2.829	0.000	0.000	0.000	0.000	0.000

Problem 1078	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.034	1.594	1.470	0.000	0.000	0.000	0.000	0.000

Problem 1079	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.099	18.816	1.724	0.000	0.000	0.000	0.000	0.000

Problem 1080	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	1.124	2.819	0.000	0.566	0.000	0.000	0.000

Problem 1081	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.076	2.752	2.658	0.000	0.000	0.000	0.000	0.000

Problem 1082	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	1.709	1.419	0.000	0.000	0.000	0.000	0.000

Problem 1083	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.111	12.113	1.611	0.000	0.000	0.000	0.000	0.000

Problem 1084	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.110	1.498	2.767	0.000	0.498	0.000	0.000	0.000

Problem 1085	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.079	3.431	2.888	0.000	0.000	0.000	0.000	0.000

Problem 1086	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.043	1.830	1.507	0.000	0.000	0.000	0.000	0.000

Problem 1087	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	11.618	1.788	0.000	0.000	0.000	0.000	0.000

Problem 1088	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.114	0.910	2.992	0.000	0.446	0.000	0.000	0.000

Problem 1089	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	27	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.075	1.849	3.424	0.000	0.000	0.000	0.000	0.000

Problem 1090	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	26	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.036	0.833	1.313	0.000	0.000	0.000	0.000	0.000

Problem 1091	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	72	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.216	3.619	1.623	0.000	0.000	0.000	0.000	0.000

Problem 1092	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.109	20.554	1.778	0.000	0.000	0.000	0.000	0.000

Problem 1093	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.118	1.074	2.875	0.000	0.499	0.000	0.000	0.000

Problem 1094	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	229	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.928	7.564	8.881	0.000	0.000	0.000	0.000	0.000

Problem 1095	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	231	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.680	6.778	8.763	0.000	0.000	0.000	0.000	0.000

Problem 1096	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	124	0	0	0	0	0	-1
normalized size	1	1.00	0.96	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.303	0.186	3.125	0.000	0.000	0.000	0.000	0.000

Problem 1097	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	126	126	120	0	0	0	0	0	-1
normalized size	1	1.00	0.95	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.228	0.149	1.399	0.000	0.000	0.000	0.000	0.000

Problem 1098	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	227	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.697	12.335	1.605	0.000	0.000	0.000	0.000	0.000

Problem 1099	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	227	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.833	13.952	1.880	0.000	0.000	0.000	0.000	0.000

Problem 1100	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	202	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.849	16.237	3.976	0.000	0.000	0.000	0.000	0.000

Problem 1101	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	206	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.852	28.495	7.534	0.000	0.000	0.000	0.000	0.000

Problem 1102	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	29	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.119	1.148	3.022	0.000	0.496	0.000	0.000	0.000

Problem 1103	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	190	190	255	0	0	0	0	0	-1
normalized size	1	1.00	1.34	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.808	0.885	8.673	0.000	0.000	0.000	0.000	0.000

Problem 1104	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	311	0	0	0	0	0	-1
normalized size	1	1.00	1.39	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.140	0.862	8.924	0.000	0.000	0.000	0.000	0.000

Problem 1105	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F(-2)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	222	222	261	0	0	0	0	0	-1
normalized size	1	1.00	1.18	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.057	0.871	3.164	0.000	0.000	0.000	0.000	0.000

Problem 1106	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	F(-2)	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	183	183	300	0	0	0	0	0	-1
normalized size	1	1.00	1.64	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.617	0.533	1.430	0.000	0.000	0.000	0.000	0.000

Problem 1107	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	287	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.768	12.982	1.592	0.000	0.000	0.000	0.000	0.000

Problem 1108	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	292	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.932	14.847	1.806	0.000	0.000	0.000	0.000	0.000

Problem 1109	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	F(-2)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	198	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.899	17.667	3.810	0.000	0.000	0.000	0.000	0.000

Problem 1110	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	F(-2)	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	206	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.918	33.156	7.450	0.000	0.000	0.000	0.000	0.000

Problem 1111	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	46	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.085	0.945	0.803	0.000	0.549	0.000	0.000	0.000

Problem 1112	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	F(-2)	A	F	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	20	20	20	21	0	21	0	20	20
normalized size	1	1.00	1.00	1.05	0.00	1.05	0.00	1.00	1.00
time (sec)	N/A	0.040	0.004	0.067	0.000	0.597	0.000	0.115	0.361

Problem 1113	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	31	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.03
time (sec)	N/A	0.099	0.718	7.556	0.000	0.494	0.000	0.000	0.000

Problem 1114	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	107	107	127	106	108	110	138	0	105
normalized size	1	1.00	1.19	0.99	1.01	1.03	1.29	0.00	0.98
time (sec)	N/A	0.110	0.007	0.043	0.409	0.448	2.005	0.000	0.621

Problem 1115	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	94	94	119	102	105	107	128	0	101
normalized size	1	1.00	1.27	1.09	1.12	1.14	1.36	0.00	1.07
time (sec)	N/A	0.139	0.024	0.054	0.314	0.481	1.378	0.000	0.573

Problem 1116	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	103	86	88	89	114	0	85
normalized size	1	1.00	1.26	1.05	1.07	1.09	1.39	0.00	1.04
time (sec)	N/A	0.070	0.005	0.041	0.415	0.478	1.178	0.000	0.291

Problem 1117	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	68	68	85	76	80	82	94	0	75
normalized size	1	1.00	1.25	1.12	1.18	1.21	1.38	0.00	1.10
time (sec)	N/A	0.072	0.010	0.040	0.314	0.461	0.712	0.000	0.516

Problem 1118	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	83	117	104	0	0	0	88
normalized size	1	1.00	1.08	1.52	1.35	0.00	0.00	0.00	1.14
time (sec)	N/A	0.093	0.005	0.059	0.620	0.430	0.000	0.000	0.678

Problem 1119	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	57	57	73	72	73	74	80	0	69
normalized size	1	1.00	1.28	1.26	1.28	1.30	1.40	0.00	1.21
time (sec)	N/A	0.077	0.005	0.043	0.322	0.491	0.953	0.000	0.226

Problem 1120	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	77	77	86	117	0	0	0	0	91
normalized size	1	1.00	1.12	1.52	0.00	0.00	0.00	0.00	1.18
time (sec)	N/A	0.099	0.005	0.066	0.000	0.413	0.000	0.000	0.719

Problem 1121	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	83	83	98	97	93	85	116	0	92
normalized size	1	1.00	1.18	1.17	1.12	1.02	1.40	0.00	1.11
time (sec)	N/A	0.119	0.035	0.057	0.319	0.425	1.286	0.000	0.553

Problem 1122	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	97	86	80	75	99	0	162
normalized size	1	1.00	1.18	1.05	0.98	0.91	1.21	0.00	1.98
time (sec)	N/A	0.090	0.005	0.049	0.410	0.477	1.016	0.000	0.588

Problem 1123	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	123	120	116	111	153	0	111
normalized size	1	1.00	1.12	1.09	1.05	1.01	1.39	0.00	1.01
time (sec)	N/A	0.129	0.048	0.068	0.313	0.445	2.147	0.000	0.236

Problem 1124	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	105	105	97	106	103	98	122	0	130
normalized size	1	1.00	0.92	1.01	0.98	0.93	1.16	0.00	1.24
time (sec)	N/A	0.109	0.006	0.049	0.422	0.410	1.598	0.000	0.593

Problem 1125	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	185	185	174	203	184	201	260	0	374
normalized size	1	1.00	0.94	1.10	0.99	1.09	1.41	0.00	2.02
time (sec)	N/A	0.193	0.152	0.043	0.411	0.421	3.802	0.000	0.536

Problem 1126	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	161	161	162	192	181	186	245	0	191
normalized size	1	1.00	1.01	1.19	1.12	1.16	1.52	0.00	1.19
time (sec)	N/A	0.246	0.130	0.042	0.318	0.419	2.744	0.000	0.795

Problem 1127	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	140	168	156	166	219	0	167
normalized size	1	1.00	1.22	1.46	1.36	1.44	1.90	0.00	1.45
time (sec)	N/A	0.114	0.103	0.038	0.433	0.428	2.502	0.000	0.458

Problem 1128	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	124	124	130	151	147	150	194	0	150
normalized size	1	1.00	1.05	1.22	1.19	1.21	1.56	0.00	1.21
time (sec)	N/A	0.160	0.103	0.043	0.399	0.521	1.627	0.000	0.662

Problem 1129	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	123	187	172	0	0	0	157
normalized size	1	1.00	0.90	1.36	1.26	0.00	0.00	0.00	1.15
time (sec)	N/A	0.180	0.110	0.059	0.639	0.672	0.000	0.000	0.713

Problem 1130	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	114	138	130	140	165	0	135
normalized size	1	1.00	1.05	1.27	1.19	1.28	1.51	0.00	1.24
time (sec)	N/A	0.156	0.114	0.048	0.331	0.456	1.832	0.000	0.700

Problem 1131	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F	F	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	128	128	118	178	153	0	0	0	157
normalized size	1	1.00	0.92	1.39	1.20	0.00	0.00	0.00	1.23
time (sec)	N/A	0.163	0.115	0.068	0.624	0.452	0.000	0.000	0.683

Problem 1132	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	115	115	119	147	135	139	180	0	142
normalized size	1	1.00	1.03	1.28	1.17	1.21	1.57	0.00	1.23
time (sec)	N/A	0.168	0.125	0.049	0.319	0.435	1.871	0.000	0.680

Problem 1133	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	139	139	130	190	0	0	0	0	177
normalized size	1	1.00	0.94	1.37	0.00	0.00	0.00	0.00	1.27
time (sec)	N/A	0.168	0.106	0.068	0.000	0.427	0.000	0.000	0.762

Problem 1134	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	150	150	149	186	166	160	235	0	179
normalized size	1	1.00	0.99	1.24	1.11	1.07	1.57	0.00	1.19
time (sec)	N/A	0.185	0.159	0.049	0.315	0.503	2.524	0.000	0.492

Problem 1135	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	112	168	145	145	192	0	256
normalized size	1	1.00	1.01	1.51	1.31	1.31	1.73	0.00	2.31
time (sec)	N/A	0.148	0.106	0.047	0.416	0.451	1.872	0.000	0.812

Problem 1136	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	186	186	177	224	197	194	289	0	232
normalized size	1	1.00	0.95	1.20	1.06	1.04	1.55	0.00	1.25
time (sec)	N/A	0.232	0.229	0.048	0.322	0.448	3.981	0.000	0.634

Problem 1137	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	240	285	262	315	268	304	411	0	599
normalized size	1	1.19	1.09	1.31	1.12	1.27	1.71	0.00	2.50
time (sec)	N/A	0.459	0.245	0.041	0.427	0.463	6.751	0.000	0.621

Problem 1138	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	239	239	252	297	265	277	389	0	296
normalized size	1	1.00	1.05	1.24	1.11	1.16	1.63	0.00	1.24
time (sec)	N/A	0.384	0.224	0.043	0.341	0.478	4.922	0.000	0.971

Problem 1139	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	217	265	232	258	350	0	442
normalized size	1	1.00	1.37	1.68	1.47	1.63	2.22	0.00	2.80
time (sec)	N/A	0.147	0.170	0.041	0.429	0.481	4.573	0.000	0.561

Problem 1140	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	188	188	192	239	222	229	306	0	238
normalized size	1	1.00	1.02	1.27	1.18	1.22	1.63	0.00	1.27
time (sec)	N/A	0.151	0.155	0.040	0.327	0.510	3.096	0.000	0.434

Problem 1141	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	F	F	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	228	228	190	272	251	0	0	0	232
normalized size	1	1.00	0.83	1.19	1.10	0.00	0.00	0.00	1.02
time (sec)	N/A	0.221	0.177	0.061	0.656	0.474	0.000	0.000	0.782

Problem 1142	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	160	160	169	211	197	206	258	0	236
normalized size	1	1.00	1.06	1.32	1.23	1.29	1.61	0.00	1.48
time (sec)	N/A	0.258	0.160	0.046	0.329	0.628	3.292	0.000	0.643

Problem 1143	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F	F	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	170	251	223	0	0	0	224
normalized size	1	1.00	0.85	1.26	1.12	0.00	0.00	0.00	1.12
time (sec)	N/A	0.211	0.164	0.066	1.658	0.494	0.000	0.000	0.730

Problem 1144	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	158	158	166	213	193	205	272	0	203
normalized size	1	1.00	1.05	1.35	1.22	1.30	1.72	0.00	1.28
time (sec)	N/A	0.265	0.171	0.049	0.339	0.465	3.302	0.000	0.638

Problem 1145	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	F	F	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	200	200	169	251	218	0	0	0	234
normalized size	1	1.00	0.84	1.26	1.09	0.00	0.00	0.00	1.17
time (sec)	N/A	0.207	0.220	0.069	0.639	0.430	0.000	0.000	0.709

Problem 1146	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	177	177	184	236	208	214	289	0	194
normalized size	1	1.00	1.04	1.33	1.18	1.21	1.63	0.00	1.10
time (sec)	N/A	0.285	0.187	0.054	0.327	0.481	3.383	0.000	0.642

Problem 1147	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	F	F	F	F(-1)	B
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	228	228	175	272	0	0	0	0	261
normalized size	1	1.00	0.77	1.19	0.00	0.00	0.00	0.00	1.14
time (sec)	N/A	0.231	0.145	0.068	0.000	0.461	0.000	0.000	0.842

Problem 1148	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	230	290	247	243	362	0	236
normalized size	1	1.00	1.03	1.29	1.10	1.08	1.62	0.00	1.05
time (sec)	N/A	0.327	0.184	0.051	0.339	0.497	4.420	0.000	0.693

Problem 1149	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	A	A	A	B	F(-1)	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	152	152	154	265	218	228	309	0	301
normalized size	1	1.00	1.01	1.74	1.43	1.50	2.03	0.00	1.98
time (sec)	N/A	0.195	0.187	0.051	0.429	0.435	3.159	0.000	0.633

Problem 1150	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	244	244	212	279	226	237	314	0	233
normalized size	1	1.00	0.87	1.14	0.93	0.97	1.29	0.00	0.95
time (sec)	N/A	0.176	0.187	0.039	0.322	0.509	4.300	0.000	0.205

Problem 1151	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	361	361	503	703	0	0	0	0	-1
normalized size	1	1.00	1.39	1.95	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.370	0.274	0.464	0.000	0.490	0.000	0.000	0.000

Problem 1152	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	311	311	441	646	0	0	0	0	-1
normalized size	1	1.00	1.42	2.08	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.243	0.117	0.361	0.000	0.445	0.000	0.000	0.000

Problem 1153	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	353	353	429	736	0	0	0	0	-1
normalized size	1	1.00	1.22	2.08	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.386	0.266	0.404	0.000	0.497	0.000	0.000	0.000

Problem 1154	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	409	409	507	801	0	0	0	0	-1
normalized size	1	1.00	1.24	1.96	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.482	0.297	0.387	0.000	0.410	0.000	0.000	0.000

Problem 1155	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	555	555	766	2409	0	0	0	0	-1
normalized size	1	1.00	1.38	4.34	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.631	3.712	0.848	0.000	0.403	0.000	0.000	0.000

Problem 1156	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	517	517	461	886	0	0	0	0	-1
normalized size	1	1.00	0.89	1.71	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.406	0.250	0.665	0.000	0.403	0.000	0.000	0.000

Problem 1157	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	561	561	468	2439	0	0	0	0	-1
normalized size	1	1.00	0.83	4.35	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.528	0.820	0.844	0.000	0.435	0.000	0.000	0.000

Problem 1158	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	403	403	522	760	0	0	0	0	-1
normalized size	1	1.00	1.30	1.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.449	8.469	0.374	0.000	0.453	0.000	0.000	0.000

Problem 1159	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	91	91	98	109	90	234	0	0	696
normalized size	1	1.00	1.08	1.20	0.99	2.57	0.00	0.00	7.65
time (sec)	N/A	0.066	0.156	0.045	0.427	0.529	0.000	0.000	0.848

Problem 1160	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	443	443	590	847	0	0	0	0	-1
normalized size	1	1.00	1.33	1.91	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.489	6.288	0.305	0.000	0.407	0.000	0.000	0.000

Problem 1161	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	489	489	643	925	0	0	0	0	-1
normalized size	1	1.00	1.31	1.89	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.513	13.704	0.368	0.000	0.406	0.000	0.000	0.000

Problem 1162	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1335	1335	877	2315	0	0	0	0	-1
normalized size	1	1.00	0.66	1.73	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.964	10.536	2.371	0.000	0.454	0.000	0.000	0.000

Problem 1163	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	819	819	861	2315	0	0	0	0	-1
normalized size	1	1.00	1.05	2.83	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.893	10.511	2.022	0.000	0.459	0.000	0.000	0.000

Problem 1164	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1382	1382	992	3851	0	0	0	0	-1
normalized size	1	1.00	0.72	2.79	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.580	13.014	1.040	0.000	0.554	0.000	0.000	0.000

Problem 1165	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	532	532	589	959	0	0	0	0	-1
normalized size	1	1.00	1.11	1.80	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.650	13.471	0.410	0.000	0.451	0.000	0.000	0.000

Problem 1166	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	130	130	158	297	216	697	0	0	273
normalized size	1	1.00	1.22	2.28	1.66	5.36	0.00	0.00	2.10
time (sec)	N/A	0.186	3.764	0.054	0.423	0.591	0.000	0.000	3.299

Problem 1167	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	B	F(-1)	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	131	131	131	216	185	637	0	0	201
normalized size	1	1.00	1.00	1.65	1.41	4.86	0.00	0.00	1.53
time (sec)	N/A	0.113	1.190	0.050	0.426	0.675	0.000	0.000	2.610

Problem 1168	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	574	574	645	1041	0	0	0	0	-1
normalized size	1	1.00	1.12	1.81	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.631	14.424	0.365	0.000	0.461	0.000	0.000	0.000

Problem 1169	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	629	629	723	1128	0	0	0	0	-1
normalized size	1	1.00	1.15	1.79	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.680	17.828	0.377	0.000	0.406	0.000	0.000	0.000

Problem 1170	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	966	966	1914	3801	0	0	0	0	-1
normalized size	1	1.00	1.98	3.93	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.260	13.075	1.080	0.000	0.418	0.000	0.000	0.000

Problem 1171	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	893	893	1745	4027	0	0	0	0	-1
normalized size	1	1.00	1.95	4.51	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.949	12.821	1.989	0.000	0.402	0.000	0.000	0.000

Problem 1172	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	1518	1518	2005	6655	0	0	0	0	-1
normalized size	1	1.00	1.32	4.38	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.636	13.425	1.378	0.000	0.408	0.000	0.000	0.000

Problem 1173	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	223	223	391	0	0	1200	0	0	-1
normalized size	1	1.00	1.75	0.00	0.00	5.38	0.00	0.00	-0.00
time (sec)	N/A	0.368	0.555	1.339	0.000	3.800	0.000	0.000	0.000

Problem 1174	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	97	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.158	11.287	1.132	0.000	0.425	0.000	0.000	0.000

Problem 1175	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	140	140	279	0	0	879	0	0	-1
normalized size	1	1.00	1.99	0.00	0.00	6.28	0.00	0.00	-0.01
time (sec)	N/A	0.142	0.561	1.037	0.000	1.097	0.000	0.000	0.000

Problem 1176	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.024	5.100	2.385	0.000	0.440	0.000	0.000	0.000

Problem 1177	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	64	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.163	82.612	1.172	0.000	0.409	0.000	0.000	0.000

Problem 1178	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	68	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.147	8.950	1.162	0.000	0.422	0.000	0.000	0.000

Problem 1179	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	73	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.165	54.925	1.125	0.000	0.409	0.000	0.000	0.000

Problem 1180	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	288	0	0	858	0	0	-1
normalized size	1	1.00	2.10	0.00	0.00	6.26	0.00	0.00	-0.01
time (sec)	N/A	0.279	0.677	1.199	0.000	0.605	0.000	0.000	0.000

Problem 1181	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	98	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.176	57.997	1.142	0.000	0.461	0.000	0.000	0.000

Problem 1182	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	224	224	413	0	0	1156	0	0	-1
normalized size	1	1.00	1.84	0.00	0.00	5.16	0.00	0.00	-0.00
time (sec)	N/A	0.352	0.549	1.233	0.000	1.086	0.000	0.000	0.000

Problem 1183	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	279	279	418	0	0	1566	0	0	-1
normalized size	1	1.00	1.50	0.00	0.00	5.61	0.00	0.00	-0.00
time (sec)	N/A	0.461	0.714	1.107	0.000	14.789	0.000	0.000	0.000

Problem 1184	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	119	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.195	11.309	1.076	0.000	0.415	0.000	0.000	0.000

Problem 1185	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	181	181	313	0	0	1192	0	0	-1
normalized size	1	1.00	1.73	0.00	0.00	6.59	0.00	0.00	-0.01
time (sec)	N/A	0.233	0.463	0.967	0.000	3.632	0.000	0.000	0.000

Problem 1186	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.028	5.252	2.060	0.000	0.412	0.000	0.000	0.000

Problem 1187	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.193	82.777	1.096	0.000	0.471	0.000	0.000	0.000

Problem 1188	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	90	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.174	9.246	1.140	0.000	0.454	0.000	0.000	0.000

Problem 1189	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	90	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.204	55.093	1.037	0.000	0.429	0.000	0.000	0.000

Problem 1190	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	88	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.175	31.658	1.089	0.000	0.503	0.000	0.000	0.000

Problem 1191	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	95	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.196	57.167	1.062	0.000	0.546	0.000	0.000	0.000

Problem 1192	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	A	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	178	178	334	0	0	1145	0	0	-1
normalized size	1	1.00	1.88	0.00	0.00	6.43	0.00	0.00	-0.01
time (sec)	N/A	0.325	0.500	1.184	0.000	1.266	0.000	0.000	0.000

Problem 1193	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	345	345	470	0	0	1978	0	0	-1
normalized size	1	1.00	1.36	0.00	0.00	5.73	0.00	0.00	-0.00
time (sec)	N/A	0.583	0.932	1.154	0.000	49.891	0.000	0.000	0.000

Problem 1194	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	141	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.227	11.803	1.107	0.000	0.569	0.000	0.000	0.000

Problem 1195	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	233	233	353	0	0	1562	0	0	-1
normalized size	1	1.00	1.52	0.00	0.00	6.70	0.00	0.00	-0.00
time (sec)	N/A	0.331	0.581	0.967	0.000	15.582	0.000	0.000	0.000

Problem 1196	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.028	5.751	2.100	0.000	0.430	0.000	0.000	0.000

Problem 1197	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	100	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.203	83.073	1.106	0.000	0.438	0.000	0.000	0.000

Problem 1198	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	111	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.187	9.199	1.111	0.000	0.477	0.000	0.000	0.000

Problem 1199	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	108	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.208	55.471	1.085	0.000	0.463	0.000	0.000	0.000

Problem 1200	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	114	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.187	9.546	1.079	0.000	0.461	0.000	0.000	0.000

Problem 1201	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	176	176	377	0	0	882	0	0	-1
normalized size	1	1.00	2.14	0.00	0.00	5.01	0.00	0.00	-0.01
time (sec)	N/A	0.248	0.518	1.224	0.000	1.344	0.000	0.000	0.000

Problem 1202	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	75	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.156	9.377	1.164	0.000	0.462	0.000	0.000	0.000

Problem 1203	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	103	103	251	0	0	647	0	0	-1
normalized size	1	1.00	2.44	0.00	0.00	6.28	0.00	0.00	-0.01
time (sec)	N/A	0.099	0.406	1.056	0.000	0.666	0.000	0.000	0.000

Problem 1204	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	23	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.04
time (sec)	N/A	0.025	3.661	2.128	0.000	0.431	0.000	0.000	0.000

Problem 1205	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	51	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.163	5.779	1.142	0.000	0.426	0.000	0.000	0.000

Problem 1206	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	247	0	0	660	0	0	-1
normalized size	1	1.00	2.47	0.00	0.00	6.60	0.00	0.00	-0.01
time (sec)	N/A	0.177	0.448	1.213	0.000	0.533	0.000	0.000	0.000

Problem 1207	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.172	57.955	1.148	0.000	0.470	0.000	0.000	0.000

Problem 1208	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	A	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	179	179	372	0	0	868	0	0	-1
normalized size	1	1.00	2.08	0.00	0.00	4.85	0.00	0.00	-0.01
time (sec)	N/A	0.266	0.531	1.256	0.000	0.619	0.000	0.000	0.000

Problem 1209	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	321	0	0	1291	0	0	-1
normalized size	1	1.00	2.34	0.00	0.00	9.42	0.00	0.00	-0.01
time (sec)	N/A	0.184	0.658	1.122	0.000	0.888	0.000	0.000	0.000

Problem 1210	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	69	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.168	20.125	1.127	0.000	0.451	0.000	0.000	0.000

Problem 1211	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	71	71	210	0	0	379	0	0	-1
normalized size	1	1.00	2.96	0.00	0.00	5.34	0.00	0.00	-0.01
time (sec)	N/A	0.074	0.398	0.993	0.000	0.528	0.000	0.000	0.000

Problem 1212	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	70	70	202	0	0	388	0	0	-1
normalized size	1	1.00	2.89	0.00	0.00	5.54	0.00	0.00	-0.01
time (sec)	N/A	0.077	0.288	2.142	0.000	0.537	0.000	0.000	0.000

Problem 1213	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	67	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.176	56.731	1.110	0.000	0.473	0.000	0.000	0.000

Problem 1214	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	135	135	306	0	0	1317	0	0	-1
normalized size	1	1.00	2.27	0.00	0.00	9.76	0.00	0.00	-0.01
time (sec)	N/A	0.230	0.698	1.040	0.000	0.696	0.000	0.000	0.000

Problem 1215	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	96	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.196	60.609	1.054	0.000	0.436	0.000	0.000	0.000

Problem 1216	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	249	249	405	0	0	1920	0	0	-1
normalized size	1	1.00	1.63	0.00	0.00	7.71	0.00	0.00	-0.00
time (sec)	N/A	0.874	0.760	1.095	0.000	0.901	0.000	0.000	0.000

Problem 1217	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	F(-2)	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	91	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.180	12.060	1.263	0.000	0.431	0.000	0.000	0.000

Problem 1218	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	143	143	326	0	0	863	0	0	-1
normalized size	1	1.00	2.28	0.00	0.00	6.03	0.00	0.00	-0.01
time (sec)	N/A	0.209	0.599	1.041	0.000	0.973	0.000	0.000	0.000

Problem 1219	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F(-1)	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	109	109	252	0	0	676	0	0	-1
normalized size	1	1.00	2.31	0.00	0.00	6.20	0.00	0.00	-0.01
time (sec)	N/A	0.199	1.111	1.099	0.000	0.758	0.000	0.000	0.000

Problem 1220	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	B	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	110	110	259	0	0	679	0	0	-1
normalized size	1	1.00	2.35	0.00	0.00	6.17	0.00	0.00	-0.01
time (sec)	N/A	0.094	0.779	0.925	0.000	0.889	0.000	0.000	0.000

Problem 1221	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	144	144	317	0	0	864	0	0	-1
normalized size	1	1.00	2.20	0.00	0.00	6.00	0.00	0.00	-0.01
time (sec)	N/A	0.314	0.600	1.995	0.000	0.990	0.000	0.000	0.000

Problem 1222	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	86	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.193	57.972	1.025	0.000	0.428	0.000	0.000	0.000

Problem 1223	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	274	274	418	0	0	2714	0	0	-1
normalized size	1	1.00	1.53	0.00	0.00	9.91	0.00	0.00	-0.00
time (sec)	N/A	0.932	1.185	1.041	0.000	2.144	0.000	0.000	0.000

Problem 1224	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	116	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.209	61.440	1.019	0.000	0.428	0.000	0.000	0.000

Problem 1225	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F	B	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	423	425	510	0	0	3460	0	0	-1
normalized size	1	1.00	1.21	0.00	0.00	8.18	0.00	0.00	-0.00
time (sec)	N/A	1.095	1.963	1.064	0.000	3.206	0.000	0.000	0.000

Problem 1226	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	208	208	345	0	0	1280	0	0	-1
normalized size	1	1.00	1.66	0.00	0.00	6.15	0.00	0.00	-0.00
time (sec)	N/A	0.996	0.955	1.283	0.000	0.569	0.000	0.000	0.000

Problem 1227	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	C	F	F(-2)	B	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	293	293	450	0	0	1986	0	0	-1
normalized size	1	1.00	1.54	0.00	0.00	6.78	0.00	0.00	-0.00
time (sec)	N/A	1.231	1.536	1.200	0.000	1.236	0.000	0.000	0.000

Problem 1228	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	378	374	264	0	0	0	0	0	-1
normalized size	1	0.99	0.70	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.983	0.611	1.936	0.000	0.494	0.000	0.000	0.000

Problem 1229	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	230	226	193	0	0	0	0	0	-1
normalized size	1	0.98	0.84	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.294	0.224	1.541	0.000	0.430	0.000	0.000	0.000

Problem 1230	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	122	122	119	0	0	0	0	0	-1
normalized size	1	1.00	0.98	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.127	0.190	1.234	0.000	0.498	0.000	0.000	0.000

Problem 1231	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.121	2.393	2.009	0.000	0.418	0.000	0.000	0.000

Problem 1232	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	63	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.02
time (sec)	N/A	0.117	5.528	1.134	0.000	0.511	0.000	0.000	0.000

Problem 1233	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.176	4.153	1.102	0.000	0.447	0.000	0.000	0.000

Problem 1234	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.172	0.128	1.016	0.000	0.510	0.000	0.000	0.000

Problem 1235	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.154	0.113	1.107	0.000	0.520	0.000	0.000	0.000

Problem 1236	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	A	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.156	3.661	1.095	0.000	0.766	0.000	0.000	0.000

Problem 1237	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	74	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.174	4.628	1.027	0.000	0.698	0.000	0.000	0.000

Problem 1238	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	76	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.176	6.161	1.030	0.000	0.540	0.000	0.000	0.000

Problem 1239	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	77	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.118	3.348	1.467	0.000	0.516	0.000	0.000	0.000

Problem 1240	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.142	3.245	1.609	0.000	0.435	0.000	0.000	0.000

Problem 1241	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	129	129	166	0	0	0	0	0	-1
normalized size	1	1.00	1.29	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.166	0.452	1.517	0.000	0.563	0.000	0.000	0.000

Problem 1242	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.140	3.575	1.498	0.000	0.660	0.000	0.000	0.000

Problem 1243	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	285	285	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.375	4.631	1.554	0.000	0.548	0.000	0.000	0.000

Problem 1244	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.144	4.159	1.503	0.000	0.430	0.000	0.000	0.000

Problem 1245	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	466	466	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.426	5.322	1.461	0.000	0.446	0.000	0.000	0.000

Problem 1246	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	A	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	81	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.141	3.216	1.435	0.000	0.445	0.000	0.000	0.000

Problem 1247	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	271	271	240	329	306	289	398	0	338
normalized size	1	1.00	0.89	1.21	1.13	1.07	1.47	0.00	1.25
time (sec)	N/A	0.651	0.269	0.052	0.444	0.477	3.686	0.000	1.556

Problem 1248	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	323	323	287	667	0	0	0	0	-1
normalized size	1	1.00	0.89	2.07	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.590	0.932	0.169	0.000	0.435	0.000	0.000	0.000

Problem 1249	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	199	199	179	249	247	218	296	0	248
normalized size	1	1.00	0.90	1.25	1.24	1.10	1.49	0.00	1.25
time (sec)	N/A	0.398	0.188	0.052	0.436	0.468	2.180	0.000	1.003

Problem 1250	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	231	231	208	570	0	0	0	0	-1
normalized size	1	1.00	0.90	2.47	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.358	0.479	0.127	0.000	0.446	0.000	0.000	0.000

Problem 1251	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	217	217	263	1284	0	0	0	0	-1
normalized size	1	1.00	1.21	5.92	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.442	0.390	4.145	0.000	0.411	0.000	0.000	0.000

Problem 1252	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	172	172	204	597	0	0	0	0	-1
normalized size	1	1.00	1.19	3.47	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.327	0.299	0.145	0.000	0.459	0.000	0.000	0.000

Problem 1253	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	220	220	273	1313	0	0	0	0	-1
normalized size	1	1.00	1.24	5.97	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.461	0.391	7.809	0.000	0.504	0.000	0.000	0.000

Problem 1254	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	502	502	414	621	516	530	758	0	929
normalized size	1	1.00	0.82	1.24	1.03	1.06	1.51	0.00	1.85
time (sec)	N/A	1.140	0.498	0.058	0.481	0.552	7.495	0.000	6.904

Problem 1255	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	580	580	513	1158	0	0	0	0	-1
normalized size	1	1.00	0.88	2.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.068	1.776	0.137	0.000	0.437	0.000	0.000	0.000

Problem 1256	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	380	380	317	484	433	416	575	0	780
normalized size	1	1.00	0.83	1.27	1.14	1.09	1.51	0.00	2.05
time (sec)	N/A	0.754	0.353	0.056	0.480	0.549	4.795	0.000	5.278

Problem 1257	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F	F	F	F	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	442	442	391	1005	0	0	0	0	-1
normalized size	1	1.00	0.88	2.27	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.689	1.115	0.131	0.000	0.466	0.000	0.000	0.000

Problem 1258	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	355	355	389	1549	0	0	0	0	-1
normalized size	1	1.00	1.10	4.36	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.690	0.721	7.829	0.000	0.472	0.000	0.000	0.000

Problem 1259	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	343	343	349	997	0	0	0	0	-1
normalized size	1	1.00	1.02	2.91	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.576	0.827	0.142	0.000	0.417	0.000	0.000	0.000

Problem 1260	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	320	320	367	1511	0	0	0	0	-1
normalized size	1	1.00	1.15	4.72	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.609	0.640	6.777	0.000	0.443	0.000	0.000	0.000

Problem 1261	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	590	590	1569	0	0	0	0	0	-1
normalized size	1	1.00	2.66	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.499	10.885	56.822	0.000	0.638	0.000	0.000	0.000

Problem 1262	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F(-1)	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	554	554	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.480	180.003	6.462	0.000	0.439	0.000	0.000	0.000

Problem 1263	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	492	492	1529	0	0	0	0	0	-1
normalized size	1	1.00	3.11	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.250	9.276	19.694	0.000	0.481	0.000	0.000	0.000

Problem 1264	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	B	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	460	460	0	2600	0	0	0	0	-1
normalized size	1	1.00	0.00	5.65	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.247	160.298	0.770	0.000	0.460	0.000	0.000	0.000

Problem 1265	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	637	637	1412	0	0	0	0	0	-1
normalized size	1	1.00	2.22	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.667	7.591	24.510	0.000	0.405	0.000	0.000	0.000

Problem 1266	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F(-1)	F	F	F	F	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	553	553	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.516	180.002	7.036	0.000	0.454	0.000	0.000	0.000

Problem 1267	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	745	745	1557	0	0	0	0	0	-1
normalized size	1	1.00	2.09	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.923	11.728	74.798	0.000	0.635	0.000	0.000	0.000

Problem 1268	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	943	943	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.759	19.754	26.505	0.000	0.398	0.000	0.000	0.000

Problem 1269	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1033	1033	0	6575	0	0	0	0	-1
normalized size	1	1.00	0.00	6.36	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.948	45.345	3.099	0.000	0.460	0.000	0.000	0.000

Problem 1270	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	B	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	457	457	885	1185	0	0	0	0	-1
normalized size	1	1.00	1.94	2.59	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.088	8.875	1.047	0.000	0.433	0.000	0.000	0.000

Problem 1271	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F(-1)	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1039	1039	0	6575	0	0	0	0	-1
normalized size	1	1.00	0.00	6.33	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.329	24.402	3.148	0.000	0.580	0.000	0.000	0.000

Problem 1272	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1087	1087	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	1.861	17.410	30.086	0.000	0.401	0.000	0.000	0.000

Problem 1273	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F(-1)	F	F(-2)	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1141	1141	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.047	180.003	8.372	0.000	0.420	0.000	0.000	0.000

Problem 1274	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	1181	1181	0	0	0	0	0	0	-1
normalized size	1	1.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	2.017	32.764	56.759	0.000	0.399	0.000	0.000	0.000

Problem 1275	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	111	111	79	3626	80	72	107	168	82
normalized size	1	1.00	0.71	32.67	0.72	0.65	0.96	1.51	0.74
time (sec)	N/A	0.444	0.029	3.777	0.421	0.392	4.641	4.696	0.481

Problem 1276	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	A	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	88	88	56	2849	62	49	83	124	69
normalized size	1	1.00	0.64	32.38	0.70	0.56	0.94	1.41	0.78
time (sec)	N/A	0.118	0.027	3.221	0.415	0.391	2.850	5.985	0.527

Problem 1277	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	82	82	64	3039	65	55	78	135	65
normalized size	1	1.00	0.78	37.06	0.79	0.67	0.95	1.65	0.79
time (sec)	N/A	0.325	0.024	2.686	0.421	0.396	1.801	0.126	0.462

Problem 1278	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	49	49	38	2240	39	33	56	86	48
normalized size	1	1.00	0.78	45.71	0.80	0.67	1.14	1.76	0.98
time (sec)	N/A	0.050	0.020	1.567	0.516	0.391	1.056	0.127	0.471

Problem 1279	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	B	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	38	38	38	1913	42	33	39	92	39
normalized size	1	1.00	1.00	50.34	1.11	0.87	1.03	2.42	1.03
time (sec)	N/A	0.106	0.010	1.364	0.414	0.390	0.588	0.122	0.460

Problem 1280	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F	F	F	F	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	189	189	0	5237	0	0	0	0	-1
normalized size	1	1.00	0.00	27.71	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.181	0.781	2.795	0.000	0.398	0.000	0.000	0.000

Problem 1281	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	C	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	41	41	41	0	58	0	37	0	36
normalized size	1	1.00	1.00	0.00	1.41	0.00	0.90	0.00	0.88
time (sec)	N/A	0.125	0.011	4.415	0.423	0.497	83.961	0.000	0.107

Problem 1282	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	69	69	49	0	70	0	0	0	-1
normalized size	1	1.00	0.71	0.00	1.01	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.075	0.032	8.365	0.472	0.424	0.000	0.000	0.000

Problem 1283	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	81	81	81	0	95	0	97	0	-1
normalized size	1	1.00	1.00	0.00	1.17	0.00	1.20	0.00	-0.01
time (sec)	N/A	0.210	0.015	4.932	0.420	0.434	28.088	0.000	0.000

Problem 1284	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	F	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	102	102	98	0	89	0	0	0	-1
normalized size	1	1.00	0.96	0.00	0.87	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.129	0.039	8.097	0.490	0.432	0.000	0.000	0.000

Problem 1285	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	A	F	C	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	114	114	114	0	115	0	134	0	-1
normalized size	1	1.00	1.00	0.00	1.01	0.00	1.18	0.00	-0.01
time (sec)	N/A	0.279	0.028	5.148	0.429	0.596	38.322	0.000	0.000

Problem 1286	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	278	278	214	4941	256	220	338	0	276
normalized size	1	1.00	0.77	17.77	0.92	0.79	1.22	0.00	0.99
time (sec)	N/A	0.693	0.192	3.796	0.433	0.559	13.493	0.000	3.346

Problem 1287	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	221	221	164	3897	224	178	279	0	297
normalized size	1	1.00	0.74	17.63	1.01	0.81	1.26	0.00	1.34
time (sec)	N/A	0.244	0.178	4.049	0.421	0.477	8.517	0.000	1.782

Problem 1288	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	213	213	171	4145	212	169	258	0	212
normalized size	1	1.00	0.80	19.46	1.00	0.79	1.21	0.00	1.00
time (sec)	N/A	0.569	0.141	2.797	0.427	0.456	5.699	0.000	2.528

Problem 1289	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	C	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	137	137	105	3074	149	116	202	0	227
normalized size	1	1.00	0.77	22.44	1.09	0.85	1.47	0.00	1.66
time (sec)	N/A	0.111	0.099	2.679	0.431	0.421	3.310	0.000	1.261

Problem 1290	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	A	A	A	A	F	B
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	100	138	192	153	105	148	0	134
normalized size	1	1.00	1.38	1.92	1.53	1.05	1.48	0.00	1.34
time (sec)	N/A	0.189	0.017	0.686	0.439	0.458	1.941	0.000	0.986

Problem 1291	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	F	C	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	282	282	0	6931	0	0	0	0	-1
normalized size	1	1.00	0.00	24.58	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.342	0.211	6.089	0.000	0.496	0.000	0.000	0.000

Problem 1292	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	100	92	111	0	0	0	160	0	-1
normalized size	1	0.92	1.11	0.00	0.00	0.00	1.60	0.00	-0.01
time (sec)	N/A	0.250	0.106	11.285	0.000	0.423	141.613	0.000	0.000

Problem 1293	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	154	154	189	0	0	0	0	0	-1
normalized size	1	1.00	1.23	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.140	0.128	38.687	0.000	0.426	0.000	0.000	0.000

Problem 1294	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	189	186	181	0	0	0	428	0	-1
normalized size	1	0.98	0.96	0.00	0.00	0.00	2.26	0.00	-0.01
time (sec)	N/A	0.428	0.182	15.917	0.000	0.601	51.579	0.000	0.000

Problem 1295	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	225	225	260	0	0	0	0	0	-1
normalized size	1	1.00	1.16	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.256	0.191	21.416	0.000	0.534	0.000	0.000	0.000

Problem 1296	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	A	F(-1)	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	248	245	259	0	0	0	474	0	-1
normalized size	1	0.99	1.04	0.00	0.00	0.00	1.91	0.00	-0.00
time (sec)	N/A	0.625	0.341	25.793	0.000	0.494	66.851	0.000	0.000

Problem 1297	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	C	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	562	562	1140	21442	0	0	0	0	-1
normalized size	1	1.00	2.03	38.15	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.712	8.973	5.645	0.000	0.585	0.000	0.000	0.000

Problem 1298	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F	F
verified	N/A	Yes	Yes	TBD	TBD	TBD	TBD	TBD	TBD
size	656	656	1352	0	0	0	0	0	-1
normalized size	1	1.00	2.06	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.831	4.555	7.987	0.000	0.429	0.000	0.000	0.000

Problem 1299	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	N/A	A	A	A	A	A	F(-1)	F(-1)	A
verified	N/A	N/A	N/A	TBD	TBD	TBD	TBD	TBD	TBD
size	102	0	0	0	0	0	0	0	-1
normalized size	1	0.00	0.00	0.00	0.00	0.00	0.00	0.00	-0.01
time (sec)	N/A	0.281	0.272	3.470	0.000	0.614	0.000	0.000	0.000

Problem 1300	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	A	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	672	672	552	0	0	0	0	0	-1
normalized size	1	1.00	0.82	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.757	1.123	5.371	0.000	0.452	0.000	0.000	0.000

Problem 1301	Optimal	Rubi	Mathematica	Maple	Maxima	Fricas	Sympy	Giac	Mupad
grade	A	A	B	F	F	F	F(-1)	F(-1)	F
verified	N/A	Yes	NO	TBD	TBD	TBD	TBD	TBD	TBD
size	528	528	1217	0	0	0	0	0	-1
normalized size	1	1.00	2.30	0.00	0.00	0.00	0.00	0.00	-0.00
time (sec)	N/A	0.769	7.206	10.358	0.000	0.496	0.000	0.000	0.000

2.3 Detailed conclusion table specific for Rubi results

The following table is specific to Rubi. It gives additional statistics for each integral. the column **steps** is the number of steps used by Rubi to obtain the antiderivative. The **rules** column is the number of unique rules used. The **integrand size** column is the leaf size of the integrand. Finally the ratio $\frac{\text{number of rules}}{\text{integrand size}}$ is given. The larger this ratio is, the harder the integral was to solve. In this test, problem number [1283] had the largest ratio of [1.250]

Table 2.1: Rubi specific breakdown of results for each integral

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1	A	7	7	1.00	21	0.333
2	A	7	7	1.00	21	0.333
3	A	7	7	1.00	19	0.368
4	A	4	3	1.00	18	0.167
5	A	8	5	1.00	21	0.238
6	A	10	8	1.00	21	0.381
7	A	4	4	1.00	21	0.190
8	A	4	4	1.00	21	0.190
9	A	4	4	1.00	21	0.190
10	A	7	7	1.00	23	0.304
11	A	7	7	1.00	23	0.304
12	A	7	7	1.00	21	0.333
13	A	4	3	1.00	20	0.150
14	A	11	8	1.00	23	0.348
15	A	13	10	1.00	23	0.435
16	A	13	10	1.00	23	0.435
17	A	4	4	1.00	23	0.174
18	A	4	4	1.00	23	0.174
19	A	4	4	1.00	23	0.174
20	A	7	7	1.00	23	0.304
21	A	7	7	1.00	23	0.304
22	A	4	4	1.00	21	0.190
23	A	4	3	1.00	20	0.150
24	A	15	10	1.00	23	0.435
25	A	16	12	1.00	23	0.522
26	A	16	12	1.00	23	0.522
27	A	17	11	1.00	23	0.478

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
28	A	4	4	1.00	23	0.174
29	A	4	5	1.00	23	0.217
30	A	4	4	1.00	23	0.174
31	A	7	7	1.00	23	0.304
32	A	4	4	1.00	23	0.174
33	A	4	4	1.00	21	0.190
34	A	4	3	1.00	20	0.150
35	A	19	11	1.00	23	0.478
36	A	20	13	1.00	23	0.565
37	A	19	13	1.00	23	0.565
38	A	20	13	1.00	23	0.565
39	A	21	11	1.00	23	0.478
40	A	4	4	1.00	23	0.174
41	A	4	5	1.00	23	0.217
42	A	4	4	1.00	23	0.174
43	A	16	11	1.00	23	0.478
44	A	11	9	1.00	23	0.391
45	A	7	6	1.00	21	0.286
46	A	3	3	1.00	20	0.150
47	A	2	2	1.00	23	0.087
48	A	8	8	1.00	23	0.348
49	A	12	10	1.00	23	0.435
50	A	17	11	1.00	23	0.478
51	A	16	12	1.00	23	0.522
52	A	13	10	1.00	23	0.435
53	A	10	8	1.00	21	0.381
54	A	5	4	1.00	20	0.200
55	A	13	10	1.00	23	0.435
56	A	18	15	1.00	23	0.652
57	A	21	16	1.00	23	0.696
58	A	21	12	1.00	23	0.522
59	A	18	10	1.00	23	0.435
60	A	15	8	1.00	23	0.348
61	A	5	5	1.00	21	0.238
62	A	5	4	1.00	20	0.200
63	A	18	10	1.00	23	0.435

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
64	A	23	15	1.00	23	0.652
65	A	26	16	1.00	23	0.696
66	A	5	4	1.00	19	0.210
67	A	3	3	1.00	20	0.150
68	A	27	15	1.00	23	0.652
69	A	22	14	1.00	23	0.609
70	A	17	12	1.00	21	0.571
71	A	9	7	1.00	20	0.350
72	A	13	11	1.00	23	0.478
73	A	12	10	1.00	23	0.435
74	A	14	11	1.00	23	0.478
75	A	18	13	1.00	23	0.565
76	A	43	15	1.00	25	0.600
77	A	36	15	1.00	25	0.600
78	A	28	14	1.00	23	0.609
79	A	12	10	1.00	22	0.454
80	A	19	14	1.00	25	0.560
81	A	17	15	1.00	25	0.600
82	A	20	15	1.00	25	0.600
83	A	16	14	1.00	25	0.560
84	A	62	15	1.00	25	0.600
85	A	52	15	1.00	25	0.600
86	A	38	14	1.00	23	0.609
87	A	16	12	1.00	22	0.546
88	A	28	16	1.00	25	0.640
89	A	23	17	1.00	25	0.680
90	A	25	20	1.00	25	0.800
91	A	28	17	1.00	25	0.680
92	A	20	15	1.00	25	0.600
93	A	24	16	1.00	25	0.640
94	A	31	15	1.00	25	0.600
95	A	26	14	1.00	25	0.560
96	A	16	12	1.00	25	0.480
97	A	9	9	1.00	23	0.391
98	A	3	4	1.00	22	0.182
99	A	3	4	1.00	25	0.160

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
100	A	8	8	1.00	25	0.320
101	A	17	13	1.00	25	0.520
102	A	26	15	1.00	25	0.600
103	A	33	18	1.00	25	0.720
104	A	24	17	1.00	25	0.680
105	A	18	14	1.00	25	0.560
106	A	13	10	1.00	23	0.435
107	A	8	6	1.00	22	0.273
108	A	19	12	1.00	25	0.480
109	A	23	16	1.00	25	0.640
110	A	31	21	1.00	25	0.840
111	A	37	17	1.00	25	0.680
112	A	31	14	1.00	25	0.560
113	A	26	10	1.00	25	0.400
114	A	13	7	1.00	23	0.304
115	A	13	6	1.00	22	0.273
116	A	32	12	1.00	25	0.480
117	A	36	16	1.00	25	0.640
118	A	18	6	1.00	21	0.286
119	A	4	5	1.00	22	0.227
120	A	26	15	1.00	22	0.682
121	A	17	13	1.00	22	0.591
122	A	11	10	1.00	20	0.500
123	A	4	5	1.00	22	0.227
124	A	11	6	1.00	22	0.273
125	A	24	6	1.00	22	0.273
126	A	42	6	1.00	22	0.273
127	A	19	12	1.00	25	0.480
128	A	10	8	1.00	23	0.348
129	A	4	5	1.00	22	0.227
130	A	4	5	1.00	25	0.200
131	A	10	9	1.00	25	0.360
132	A	18	11	1.00	25	0.440
133	A	0	0	0.00	0	0.000
134	A	16	12	1.00	19	0.632
135	A	12	10	1.00	19	0.526

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
136	A	9	7	1.00	17	0.412
137	A	4	4	1.00	16	0.250
138	A	9	7	1.00	19	0.368
139	A	14	12	1.00	19	0.632
140	A	17	14	1.00	19	0.737
141	A	23	13	1.00	21	0.619
142	A	14	11	1.00	21	0.524
143	A	8	7	1.00	19	0.368
144	A	1	1	1.00	18	0.056
145	A	9	7	1.00	21	0.333
146	A	13	11	1.00	21	0.524
147	A	21	16	1.00	21	0.762
148	A	0	0	0.00	0	0.000
149	A	9	4	1.00	18	0.222
150	A	9	4	1.00	18	0.222
151	A	2	1	1.00	16	0.062
152	A	3	3	1.30	15	0.200
153	A	7	6	1.00	18	0.333
154	A	8	8	1.00	18	0.444
155	A	7	6	1.00	18	0.333
156	A	10	7	1.00	18	0.389
157	A	14	4	1.00	20	0.200
158	A	14	4	1.00	20	0.200
159	A	3	2	1.00	18	0.111
160	A	4	3	1.00	17	0.176
161	A	12	7	1.00	20	0.350
162	A	13	9	1.00	20	0.450
163	A	11	7	1.00	20	0.350
164	A	13	9	1.00	20	0.450
165	A	18	4	1.00	20	0.200
166	A	18	4	1.00	20	0.200
167	A	3	2	1.00	18	0.111
168	A	5	3	1.00	17	0.176
169	A	16	7	1.00	20	0.350
170	A	17	9	1.00	20	0.450
171	A	15	8	1.00	20	0.400

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
172	A	17	10	1.00	20	0.500
173	A	9	7	1.00	20	0.350
174	A	8	8	1.00	20	0.400
175	A	4	4	1.00	20	0.200
176	A	4	4	1.00	18	0.222
177	A	1	1	1.00	17	0.059
178	A	3	3	1.00	20	0.150
179	A	7	7	1.00	20	0.350
180	A	7	7	1.00	20	0.350
181	A	12	8	1.00	20	0.400
182	A	17	12	1.00	20	0.600
183	A	7	6	1.00	20	0.300
184	A	8	8	1.00	20	0.400
185	A	2	2	1.00	20	0.100
186	A	3	3	1.00	18	0.167
187	A	2	2	1.00	17	0.118
188	A	7	7	1.00	20	0.350
189	A	10	10	1.00	20	0.500
190	A	15	11	1.00	20	0.550
191	A	23	11	1.00	20	0.550
192	A	4	3	1.00	20	0.150
193	A	3	3	1.00	20	0.150
194	A	4	3	1.00	18	0.167
195	A	3	3	1.00	17	0.176
196	A	12	7	1.00	20	0.350
197	A	14	11	1.00	20	0.550
198	A	28	11	1.00	20	0.550
199	A	38	12	1.00	20	0.600
200	A	12	6	1.00	22	0.273
201	A	8	7	1.00	22	0.318
202	A	4	4	1.00	20	0.200
203	A	3	3	1.00	19	0.158
204	A	5	5	1.00	22	0.227
205	A	7	7	1.00	22	0.318
206	A	6	5	1.00	22	0.227
207	A	5	5	1.00	22	0.227

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
208	A	31	7	1.00	22	0.318
209	A	21	8	1.00	22	0.364
210	A	5	4	1.00	20	0.200
211	A	4	3	1.00	19	0.158
212	A	10	8	1.00	22	0.364
213	A	11	8	1.00	22	0.364
214	A	12	8	1.00	22	0.364
215	A	13	8	1.00	22	0.364
216	A	76	7	1.00	22	0.318
217	A	51	8	1.00	22	0.364
218	A	6	4	1.00	20	0.200
219	A	5	3	1.00	19	0.158
220	A	16	8	1.00	22	0.364
221	A	16	8	1.00	22	0.364
222	A	23	10	1.00	22	0.454
223	A	25	9	1.00	22	0.409
224	A	7	5	1.00	22	0.227
225	A	4	4	1.00	22	0.182
226	A	3	3	1.00	20	0.150
227	A	2	2	1.00	19	0.105
228	A	2	2	1.00	22	0.091
229	A	4	4	1.00	22	0.182
230	A	4	4	1.00	22	0.182
231	A	9	6	1.00	22	0.273
232	A	6	5	1.00	22	0.227
233	A	3	3	1.00	22	0.136
234	A	2	2	1.00	20	0.100
235	A	1	1	1.00	19	0.053
236	A	5	5	1.00	22	0.227
237	A	6	6	1.00	22	0.273
238	A	10	7	1.00	22	0.318
239	A	16	8	1.00	22	0.364
240	A	10	6	1.00	22	0.273
241	A	8	7	1.00	22	0.318
242	A	3	3	1.00	22	0.136
243	A	4	3	1.00	22	0.136

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
244	A	3	3	1.00	20	0.150
245	A	2	2	1.00	19	0.105
246	A	9	6	1.00	22	0.273
247	A	9	7	1.00	22	0.318
248	A	10	3	1.00	20	0.150
249	A	8	3	1.00	20	0.150
250	A	5	3	1.00	18	0.167
251	A	0	0	0.00	0	0.000
252	A	0	0	0.00	0	0.000
253	A	0	0	0.00	0	0.000
254	A	0	0	0.00	0	0.000
255	A	0	0	0.00	0	0.000
256	A	0	0	0.00	0	0.000
257	A	0	0	0.00	0	0.000
258	A	26	8	1.00	20	0.400
259	A	24	10	1.00	20	0.500
260	A	4	4	1.00	18	0.222
261	A	7	7	1.00	17	0.412
262	A	12	10	1.00	20	0.500
263	A	10	10	1.00	20	0.500
264	A	15	12	1.00	20	0.600
265	A	13	8	1.00	20	0.400
266	A	47	8	1.00	22	0.364
267	A	44	10	1.00	22	0.454
268	A	5	4	1.00	20	0.200
269	A	9	7	1.00	19	0.368
270	A	23	12	1.00	22	0.546
271	A	20	13	1.00	22	0.591
272	A	21	15	1.00	22	0.682
273	A	19	13	1.00	22	0.591
274	A	72	8	1.00	22	0.364
275	A	68	10	1.00	22	0.454
276	A	6	4	1.00	20	0.200
277	A	12	8	1.00	19	0.421
278	A	38	12	1.00	22	0.546
279	A	34	14	1.00	22	0.636

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
280	A	31	16	1.00	22	0.727
281	A	28	15	1.00	22	0.682
282	A	17	10	1.00	22	0.454
283	A	10	9	1.00	22	0.409
284	A	7	7	1.00	22	0.318
285	A	4	5	1.00	20	0.250
286	A	1	1	1.00	19	0.053
287	A	4	5	1.00	22	0.227
288	A	6	6	1.00	22	0.273
289	A	13	11	1.00	22	0.500
290	A	15	8	1.00	22	0.364
291	A	8	9	1.00	22	0.409
292	A	4	4	1.00	22	0.182
293	A	3	3	1.00	20	0.150
294	A	4	4	1.00	19	0.210
295	A	8	9	1.00	22	0.409
296	A	11	11	1.00	22	0.500
297	A	22	15	1.00	22	0.682
298	A	27	13	1.00	22	0.591
299	A	4	4	1.00	22	0.182
300	A	13	6	1.00	22	0.273
301	A	4	4	1.00	20	0.200
302	A	8	5	1.00	19	0.263
303	A	13	10	1.00	22	0.454
304	A	20	12	1.00	22	0.546
305	A	36	16	1.00	22	0.727
306	A	48	14	1.00	22	0.636
307	A	26	8	1.00	24	0.333
308	A	35	12	1.00	24	0.500
309	A	4	4	1.00	22	0.182
310	A	12	9	1.00	21	0.429
311	A	13	10	1.00	24	0.417
312	A	13	10	1.00	24	0.417
313	A	24	12	1.00	24	0.500
314	A	7	6	1.00	24	0.250
315	A	75	8	1.00	24	0.333

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
316	A	92	12	1.00	24	0.500
317	A	5	4	1.00	22	0.182
318	A	16	10	1.00	21	0.476
319	A	18	11	1.00	24	0.458
320	A	26	13	1.00	24	0.542
321	A	38	15	1.00	24	0.625
322	A	21	13	1.00	24	0.542
323	A	203	8	1.00	24	0.333
324	A	238	12	1.00	24	0.500
325	A	6	4	1.00	22	0.182
326	A	21	10	1.00	21	0.476
327	A	24	11	1.00	24	0.458
328	A	43	14	1.00	24	0.583
329	A	57	16	1.00	24	0.667
330	A	48	16	1.00	24	0.667
331	A	8	5	1.00	24	0.208
332	A	13	10	1.00	24	0.417
333	A	3	3	1.00	22	0.136
334	A	9	6	1.00	21	0.286
335	A	9	6	1.00	24	0.250
336	A	3	3	1.00	24	0.125
337	A	14	11	1.00	24	0.458
338	A	8	5	1.00	24	0.208
339	A	6	5	1.00	24	0.208
340	A	12	9	1.00	24	0.375
341	A	2	2	1.00	22	0.091
342	A	2	2	1.00	21	0.095
343	A	12	9	1.00	24	0.375
344	A	6	6	1.00	24	0.250
345	A	27	14	1.00	24	0.583
346	A	15	8	1.00	24	0.333
347	A	13	8	1.00	24	0.333
348	A	17	12	1.00	24	0.500
349	A	6	5	1.00	24	0.208
350	A	4	4	1.00	24	0.167
351	A	3	3	1.00	22	0.136

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
352	A	5	4	1.00	21	0.190
353	A	16	10	1.00	24	0.417
354	A	12	8	1.00	24	0.333
355	A	0	0	0.00	0	0.000
356	A	0	0	0.00	0	0.000
357	A	0	0	0.00	0	0.000
358	A	0	0	0.00	0	0.000
359	A	0	0	0.00	0	0.000
360	A	0	0	0.00	0	0.000
361	A	0	0	0.00	0	0.000
362	A	0	0	0.00	0	0.000
363	A	52	12	1.00	20	0.600
364	A	34	12	1.00	20	0.600
365	A	8	8	1.00	18	0.444
366	A	8	8	1.00	17	0.471
367	A	17	14	1.00	20	0.700
368	A	11	11	1.00	20	0.550
369	A	16	12	1.00	20	0.600
370	A	20	12	1.00	20	0.600
371	A	106	12	1.00	22	0.546
372	A	73	12	1.00	22	0.546
373	A	10	8	1.00	20	0.400
374	A	12	9	1.00	19	0.474
375	A	36	16	1.00	22	0.727
376	A	23	13	1.00	22	0.591
377	A	25	18	1.00	22	0.818
378	A	26	16	1.00	22	0.727
379	A	184	12	1.00	22	0.546
380	A	132	12	1.00	22	0.546
381	A	13	9	1.00	20	0.450
382	A	17	9	1.00	19	0.474
383	A	69	17	1.00	22	0.773
384	A	45	15	1.00	22	0.682
385	A	43	20	1.00	22	0.909
386	A	37	18	1.00	22	0.818
387	A	19	9	1.00	22	0.409

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
388	A	14	11	1.00	22	0.500
389	A	7	7	1.00	22	0.318
390	A	5	6	1.00	20	0.300
391	A	1	1	1.00	19	0.053
392	A	5	6	1.00	22	0.273
393	A	7	7	1.00	22	0.318
394	A	13	9	1.00	22	0.409
395	A	22	11	1.00	22	0.500
396	A	11	11	1.00	22	0.500
397	A	4	4	1.00	22	0.182
398	A	5	4	1.00	20	0.200
399	A	4	3	1.00	19	0.158
400	A	11	11	1.00	22	0.500
401	A	12	11	1.00	22	0.500
402	A	25	14	1.00	22	0.636
403	A	35	15	1.00	22	0.682
404	A	9	7	1.00	22	0.318
405	A	13	6	1.00	22	0.273
406	A	9	5	1.00	20	0.250
407	A	8	5	1.00	19	0.263
408	A	21	12	1.00	22	0.546
409	A	21	13	1.00	22	0.591
410	A	47	15	1.00	22	0.682
411	A	57	17	1.00	22	0.773
412	A	71	12	1.00	24	0.500
413	A	40	12	1.00	24	0.500
414	A	13	10	1.00	22	0.454
415	A	14	9	1.00	21	0.429
416	A	22	12	1.00	24	0.500
417	A	22	12	1.00	24	0.500
418	A	27	11	1.00	24	0.458
419	A	25	12	1.00	24	0.500
420	A	200	12	1.00	24	0.500
421	A	108	14	1.00	24	0.583
422	A	17	11	1.00	22	0.500
423	A	18	10	1.00	21	0.476

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
424	A	36	15	1.00	24	0.625
425	A	37	14	1.00	24	0.583
426	A	50	15	1.00	24	0.625
427	A	48	16	1.00	24	0.667
428	A	547	12	1.00	24	0.500
429	A	293	14	1.00	24	0.583
430	A	22	11	1.00	22	0.500
431	A	23	10	1.00	21	0.476
432	A	54	16	1.00	24	0.667
433	A	56	15	1.00	24	0.625
434	A	87	18	1.00	24	0.750
435	A	86	18	1.00	24	0.750
436	A	24	10	1.00	24	0.417
437	A	15	10	1.00	24	0.417
438	A	10	7	1.00	22	0.318
439	A	11	7	1.00	21	0.333
440	A	11	7	1.00	24	0.292
441	A	10	7	1.00	24	0.292
442	A	15	10	1.00	24	0.417
443	A	25	11	1.00	24	0.458
444	A	14	10	1.00	24	0.417
445	A	14	10	1.00	24	0.417
446	A	3	3	1.00	22	0.136
447	A	2	2	1.00	21	0.095
448	A	15	11	1.00	24	0.458
449	A	13	10	1.00	24	0.417
450	A	22	12	1.00	24	0.500
451	A	22	15	1.00	24	0.625
452	A	7	5	1.00	24	0.208
453	A	7	6	1.00	24	0.250
454	A	6	5	1.00	22	0.227
455	A	5	4	1.00	21	0.190
456	A	22	13	1.00	24	0.542
457	A	19	12	1.00	24	0.500
458	A	0	0	0.00	0	0.000
459	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
460	A	0	0	0.00	0	0.000
461	A	0	0	0.00	0	0.000
462	A	0	0	0.00	0	0.000
463	A	0	0	0.00	0	0.000
464	A	0	0	0.00	0	0.000
465	A	0	0	0.00	0	0.000
466	A	0	0	0.00	0	0.000
467	A	0	0	0.00	0	0.000
468	A	0	0	0.00	0	0.000
469	A	0	0	0.00	0	0.000
470	A	0	0	0.00	0	0.000
471	A	0	0	0.00	0	0.000
472	A	0	0	0.00	0	0.000
473	A	0	0	0.00	0	0.000
474	A	0	0	0.00	0	0.000
475	A	0	0	0.00	0	0.000
476	A	0	0	0.00	0	0.000
477	A	1	1	1.00	19	0.053
478	A	0	0	0.00	0	0.000
479	A	0	0	0.00	0	0.000
480	A	0	0	0.00	0	0.000
481	A	0	0	0.00	0	0.000
482	A	4	3	1.00	22	0.136
483	A	4	4	1.00	20	0.200
484	A	4	3	1.00	19	0.158
485	A	0	0	0.00	0	0.000
486	A	0	0	0.00	0	0.000
487	A	0	0	0.00	0	0.000
488	A	0	0	0.00	0	0.000
489	A	5	3	1.00	22	0.136
490	A	5	3	1.00	22	0.136
491	A	4	3	1.00	22	0.136
492	A	5	3	1.00	20	0.150
493	A	5	3	1.00	19	0.158
494	A	0	0	0.00	0	0.000
495	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
496	A	0	0	0.00	0	0.000
497	A	0	0	0.00	0	0.000
498	A	0	0	0.00	0	0.000
499	A	0	0	0.00	0	0.000
500	A	0	0	0.00	0	0.000
501	A	0	0	0.00	0	0.000
502	A	0	0	0.00	0	0.000
503	A	0	0	0.00	0	0.000
504	A	0	0	0.00	0	0.000
505	A	0	0	0.00	0	0.000
506	A	0	0	0.00	0	0.000
507	A	0	0	0.00	0	0.000
508	A	0	0	0.00	0	0.000
509	A	0	0	0.00	0	0.000
510	A	3	3	1.00	22	0.136
511	A	3	3	1.00	21	0.143
512	A	0	0	0.00	0	0.000
513	A	0	0	0.00	0	0.000
514	A	0	0	0.00	0	0.000
515	A	0	0	0.00	0	0.000
516	A	6	4	1.00	24	0.167
517	A	6	4	1.00	24	0.167
518	A	6	4	1.00	22	0.182
519	A	6	4	1.00	21	0.190
520	A	0	0	0.00	0	0.000
521	A	0	0	0.00	0	0.000
522	A	0	0	0.00	0	0.000
523	A	0	0	0.00	0	0.000
524	A	0	0	0.00	0	0.000
525	A	0	0	0.00	0	0.000
526	A	0	0	0.00	0	0.000
527	A	0	0	0.00	0	0.000
528	A	0	0	0.00	0	0.000
529	A	0	0	0.00	0	0.000
530	A	0	0	0.00	0	0.000
531	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
532	A	0	0	0.00	0	0.000
533	A	0	0	0.00	0	0.000
534	A	0	0	0.00	0	0.000
535	A	0	0	0.00	0	0.000
536	A	0	0	0.00	0	0.000
537	A	0	0	0.00	0	0.000
538	A	0	0	0.00	0	0.000
539	A	0	0	0.00	0	0.000
540	A	0	0	0.00	0	0.000
541	A	0	0	0.00	0	0.000
542	A	0	0	0.00	0	0.000
543	A	0	0	0.00	0	0.000
544	A	0	0	0.00	0	0.000
545	A	0	0	0.00	0	0.000
546	A	1	1	1.00	19	0.053
547	A	0	0	0.00	0	0.000
548	A	0	0	0.00	0	0.000
549	A	0	0	0.00	0	0.000
550	A	0	0	0.00	0	0.000
551	A	0	0	0.00	0	0.000
552	A	5	5	1.00	22	0.227
553	A	9	5	1.00	20	0.250
554	A	5	5	1.00	19	0.263
555	A	0	0	0.00	0	0.000
556	A	0	0	0.00	0	0.000
557	A	0	0	0.00	0	0.000
558	A	0	0	0.00	0	0.000
559	A	20	7	1.00	22	0.318
560	A	12	6	1.00	22	0.273
561	A	10	6	1.00	20	0.300
562	A	6	4	1.00	19	0.210
563	A	0	0	0.00	0	0.000
564	A	0	0	0.00	0	0.000
565	A	0	0	0.00	0	0.000
566	A	0	0	0.00	0	0.000
567	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
568	A	0	0	0.00	0	0.000
569	A	0	0	0.00	0	0.000
570	A	0	0	0.00	0	0.000
571	A	0	0	0.00	0	0.000
572	A	0	0	0.00	0	0.000
573	A	0	0	0.00	0	0.000
574	A	0	0	0.00	0	0.000
575	A	0	0	0.00	0	0.000
576	A	0	0	0.00	0	0.000
577	A	0	0	0.00	0	0.000
578	A	0	0	0.00	0	0.000
579	A	0	0	0.00	0	0.000
580	A	0	0	0.00	0	0.000
581	A	4	4	1.00	22	0.182
582	A	4	4	1.00	21	0.190
583	A	0	0	0.00	0	0.000
584	A	0	0	0.00	0	0.000
585	A	0	0	0.00	0	0.000
586	A	0	0	0.00	0	0.000
587	A	0	0	0.00	0	0.000
588	A	0	0	0.00	0	0.000
589	A	7	5	1.00	24	0.208
590	A	12	6	1.00	24	0.250
591	A	13	8	1.00	22	0.364
592	A	7	5	1.00	21	0.238
593	A	0	0	0.00	0	0.000
594	A	0	0	0.00	0	0.000
595	A	0	0	0.00	0	0.000
596	A	0	0	0.00	0	0.000
597	A	0	0	0.00	0	0.000
598	A	0	0	0.00	0	0.000
599	A	0	0	0.00	0	0.000
600	A	0	0	0.00	0	0.000
601	A	0	0	0.00	0	0.000
602	A	0	0	0.00	0	0.000
603	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
604	A	0	0	0.00	0	0.000
605	A	0	0	0.00	0	0.000
606	A	0	0	0.00	0	0.000
607	A	0	0	0.00	0	0.000
608	A	0	0	0.00	0	0.000
609	A	0	0	0.00	0	0.000
610	A	0	0	0.00	0	0.000
611	A	0	0	0.00	0	0.000
612	A	0	0	0.00	0	0.000
613	A	0	0	0.00	0	0.000
614	A	0	0	0.00	0	0.000
615	A	0	0	0.00	0	0.000
616	A	0	0	0.00	0	0.000
617	A	0	0	0.00	0	0.000
618	A	0	0	0.00	0	0.000
619	A	0	0	0.00	0	0.000
620	A	0	0	0.00	0	0.000
621	A	0	0	0.00	0	0.000
622	A	1	1	1.00	19	0.053
623	A	0	0	0.00	0	0.000
624	A	0	0	0.00	0	0.000
625	A	0	0	0.00	0	0.000
626	A	0	0	0.00	0	0.000
627	A	0	0	0.00	0	0.000
628	A	10	6	1.00	22	0.273
629	A	5	5	1.00	20	0.250
630	A	10	6	1.00	19	0.316
631	A	0	0	0.00	0	0.000
632	A	0	0	0.00	0	0.000
633	A	0	0	0.00	0	0.000
634	A	0	0	0.00	0	0.000
635	A	25	8	1.00	22	0.364
636	A	22	8	1.00	22	0.364
637	A	19	7	1.00	20	0.350
638	A	11	7	1.00	19	0.368
639	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
640	A	0	0	0.00	0	0.000
641	A	0	0	0.00	0	0.000
642	A	0	0	0.00	0	0.000
643	A	2	1	1.00	38	0.026
644	A	0	0	0.00	0	0.000
645	A	0	0	0.00	0	0.000
646	A	0	0	0.00	0	0.000
647	A	0	0	0.00	0	0.000
648	A	0	0	0.00	0	0.000
649	A	0	0	0.00	0	0.000
650	A	0	0	0.00	0	0.000
651	A	0	0	0.00	0	0.000
652	A	0	0	0.00	0	0.000
653	A	0	0	0.00	0	0.000
654	A	0	0	0.00	0	0.000
655	A	0	0	0.00	0	0.000
656	A	0	0	0.00	0	0.000
657	A	0	0	0.00	0	0.000
658	A	0	0	0.00	0	0.000
659	A	0	0	0.00	0	0.000
660	A	5	5	1.00	22	0.227
661	A	5	5	1.00	21	0.238
662	A	0	0	0.00	0	0.000
663	A	0	0	0.00	0	0.000
664	A	0	0	0.00	0	0.000
665	A	0	0	0.00	0	0.000
666	A	0	0	0.00	0	0.000
667	A	0	0	0.00	0	0.000
668	A	13	7	1.00	24	0.292
669	A	20	11	1.00	24	0.458
670	A	20	7	1.00	22	0.318
671	A	14	9	1.00	21	0.429
672	A	0	0	0.00	0	0.000
673	A	0	0	0.00	0	0.000
674	A	0	0	0.00	0	0.000
675	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
676	A	0	0	0.00	0	0.000
677	A	0	0	0.00	0	0.000
678	A	0	0	0.00	0	0.000
679	A	0	0	0.00	0	0.000
680	A	0	0	0.00	0	0.000
681	A	0	0	0.00	0	0.000
682	A	0	0	0.00	0	0.000
683	A	0	0	0.00	0	0.000
684	A	0	0	0.00	0	0.000
685	A	0	0	0.00	0	0.000
686	A	0	0	0.00	0	0.000
687	A	0	0	0.00	0	0.000
688	A	0	0	0.00	0	0.000
689	A	0	0	0.00	0	0.000
690	A	0	0	0.00	0	0.000
691	A	0	0	0.00	0	0.000
692	A	0	0	0.00	0	0.000
693	A	0	0	0.00	0	0.000
694	A	0	0	0.00	0	0.000
695	A	0	0	0.00	0	0.000
696	A	0	0	0.00	0	0.000
697	A	0	0	0.00	0	0.000
698	A	0	0	0.00	0	0.000
699	A	0	0	0.00	0	0.000
700	A	0	0	0.00	0	0.000
701	A	0	0	0.00	0	0.000
702	A	1	1	1.00	21	0.048
703	A	0	0	0.00	0	0.000
704	A	0	0	0.00	0	0.000
705	A	0	0	0.00	0	0.000
706	A	0	0	0.00	0	0.000
707	A	0	0	0.00	0	0.000
708	A	0	0	0.00	0	0.000
709	A	6	6	1.00	24	0.250
710	A	6	5	1.00	22	0.227
711	A	6	6	1.00	21	0.286

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
712	A	0	0	0.00	0	0.000
713	A	0	0	0.00	0	0.000
714	A	0	0	0.00	0	0.000
715	A	9	5	1.00	24	0.208
716	A	8	5	1.00	24	0.208
717	A	6	5	1.00	24	0.208
718	A	8	5	1.00	22	0.227
719	A	9	5	1.00	21	0.238
720	A	0	0	0.00	0	0.000
721	A	0	0	0.00	0	0.000
722	A	0	0	0.00	0	0.000
723	A	0	0	0.00	0	0.000
724	A	0	0	0.00	0	0.000
725	A	0	0	0.00	0	0.000
726	A	0	0	0.00	0	0.000
727	A	0	0	0.00	0	0.000
728	A	0	0	0.00	0	0.000
729	A	0	0	0.00	0	0.000
730	A	0	0	0.00	0	0.000
731	A	0	0	0.00	0	0.000
732	A	0	0	0.00	0	0.000
733	A	0	0	0.00	0	0.000
734	A	0	0	0.00	0	0.000
735	A	0	0	0.00	0	0.000
736	A	0	0	0.00	0	0.000
737	A	0	0	0.00	0	0.000
738	A	0	0	0.00	0	0.000
739	A	0	0	0.00	0	0.000
740	A	0	0	0.00	0	0.000
741	A	0	0	0.00	0	0.000
742	A	0	0	0.00	0	0.000
743	A	0	0	0.00	0	0.000
744	A	0	0	0.00	0	0.000
745	A	5	5	1.00	24	0.208
746	A	5	5	1.00	23	0.217
747	A	0	0	0.00	0	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
748	A	0	0	0.00	0	0.000
749	A	0	0	0.00	0	0.000
750	A	0	0	0.00	0	0.000
751	A	10	6	1.00	26	0.231
752	A	9	6	1.00	26	0.231
753	A	9	6	1.00	24	0.250
754	A	10	6	1.00	23	0.261
755	A	0	0	0.00	0	0.000
756	A	0	0	0.00	0	0.000
757	A	0	0	0.00	0	0.000
758	A	0	0	0.00	0	0.000
759	A	0	0	0.00	0	0.000
760	A	0	0	0.00	0	0.000
761	A	0	0	0.00	0	0.000
762	A	0	0	0.00	0	0.000
763	A	0	0	0.00	0	0.000
764	A	0	0	0.00	0	0.000
765	A	0	0	0.00	0	0.000
766	A	0	0	0.00	0	0.000
767	A	0	0	0.00	0	0.000
768	A	0	0	0.00	0	0.000
769	A	0	0	0.00	0	0.000
770	A	0	0	0.00	0	0.000
771	A	0	0	0.00	0	0.000
772	A	0	0	0.00	0	0.000
773	A	0	0	0.00	0	0.000
774	A	0	0	0.00	0	0.000
775	A	0	0	0.00	0	0.000
776	A	0	0	0.00	0	0.000
777	A	0	0	0.00	0	0.000
778	A	1	1	1.00	21	0.048
779	A	0	0	0.00	0	0.000
780	A	0	0	0.00	0	0.000
781	A	0	0	0.00	0	0.000
782	A	0	0	0.00	0	0.000
783	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
784	A	0	0	0.00	0	0.000
785	A	7	6	1.00	24	0.250
786	A	7	7	1.00	22	0.318
787	A	7	6	1.00	21	0.286
788	A	0	0	0.00	0	0.000
789	A	0	0	0.00	0	0.000
790	A	0	0	0.00	0	0.000
791	A	15	8	1.00	24	0.333
792	A	10	6	1.00	24	0.250
793	A	7	5	1.00	24	0.208
794	A	10	6	1.00	22	0.273
795	A	15	7	1.00	21	0.333
796	A	0	0	0.00	0	0.000
797	A	0	0	0.00	0	0.000
798	A	0	0	0.00	0	0.000
799	A	0	0	0.00	0	0.000
800	A	0	0	0.00	0	0.000
801	A	0	0	0.00	0	0.000
802	A	0	0	0.00	0	0.000
803	A	0	0	0.00	0	0.000
804	A	0	0	0.00	0	0.000
805	A	0	0	0.00	0	0.000
806	A	0	0	0.00	0	0.000
807	A	0	0	0.00	0	0.000
808	A	0	0	0.00	0	0.000
809	A	0	0	0.00	0	0.000
810	A	0	0	0.00	0	0.000
811	A	0	0	0.00	0	0.000
812	A	0	0	0.00	0	0.000
813	A	0	0	0.00	0	0.000
814	A	0	0	0.00	0	0.000
815	A	0	0	0.00	0	0.000
816	A	0	0	0.00	0	0.000
817	A	0	0	0.00	0	0.000
818	A	0	0	0.00	0	0.000
819	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
820	A	0	0	0.00	0	0.000
821	A	0	0	0.00	0	0.000
822	A	0	0	0.00	0	0.000
823	A	0	0	0.00	0	0.000
824	A	6	6	1.00	24	0.250
825	A	5	5	1.00	23	0.217
826	A	0	0	0.00	0	0.000
827	A	0	0	0.00	0	0.000
828	A	0	0	0.00	0	0.000
829	A	0	0	0.00	0	0.000
830	A	0	0	0.00	0	0.000
831	A	15	10	1.00	26	0.385
832	A	11	7	1.00	26	0.269
833	A	11	7	1.00	24	0.292
834	A	14	7	1.00	23	0.304
835	A	0	0	0.00	0	0.000
836	A	0	0	0.00	0	0.000
837	A	0	0	0.00	0	0.000
838	A	0	0	0.00	0	0.000
839	A	0	0	0.00	0	0.000
840	A	0	0	0.00	0	0.000
841	A	0	0	0.00	0	0.000
842	A	0	0	0.00	0	0.000
843	A	0	0	0.00	0	0.000
844	A	0	0	0.00	0	0.000
845	A	0	0	0.00	0	0.000
846	A	0	0	0.00	0	0.000
847	A	0	0	0.00	0	0.000
848	A	0	0	0.00	0	0.000
849	A	0	0	0.00	0	0.000
850	A	0	0	0.00	0	0.000
851	A	0	0	0.00	0	0.000
852	A	0	0	0.00	0	0.000
853	A	0	0	0.00	0	0.000
854	A	0	0	0.00	0	0.000
855	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
856	A	0	0	0.00	0	0.000
857	A	0	0	0.00	0	0.000
858	A	0	0	0.00	0	0.000
859	A	1	1	1.00	21	0.048
860	A	0	0	0.00	0	0.000
861	A	0	0	0.00	0	0.000
862	A	0	0	0.00	0	0.000
863	A	0	0	0.00	0	0.000
864	A	0	0	0.00	0	0.000
865	A	0	0	0.00	0	0.000
866	A	8	8	1.00	24	0.333
867	A	8	6	1.00	22	0.273
868	A	8	7	1.00	21	0.333
869	A	0	0	0.00	0	0.000
870	A	0	0	0.00	0	0.000
871	A	0	0	0.00	0	0.000
872	A	18	11	1.00	24	0.458
873	A	16	9	1.00	24	0.375
874	A	8	5	1.00	24	0.208
875	A	16	7	1.00	22	0.318
876	A	18	11	1.00	21	0.524
877	A	0	0	0.00	0	0.000
878	A	0	0	0.00	0	0.000
879	A	0	0	0.00	0	0.000
880	A	0	0	0.00	0	0.000
881	A	0	0	0.00	0	0.000
882	A	0	0	0.00	0	0.000
883	A	0	0	0.00	0	0.000
884	A	0	0	0.00	0	0.000
885	A	0	0	0.00	0	0.000
886	A	0	0	0.00	0	0.000
887	A	0	0	0.00	0	0.000
888	A	0	0	0.00	0	0.000
889	A	0	0	0.00	0	0.000
890	A	0	0	0.00	0	0.000
891	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
892	A	0	0	0.00	0	0.000
893	A	0	0	0.00	0	0.000
894	A	0	0	0.00	0	0.000
895	A	0	0	0.00	0	0.000
896	A	0	0	0.00	0	0.000
897	A	0	0	0.00	0	0.000
898	A	0	0	0.00	0	0.000
899	A	0	0	0.00	0	0.000
900	A	0	0	0.00	0	0.000
901	A	0	0	0.00	0	0.000
902	A	0	0	0.00	0	0.000
903	A	0	0	0.00	0	0.000
904	A	6	6	1.00	24	0.250
905	A	6	6	1.00	23	0.261
906	A	0	0	0.00	0	0.000
907	A	0	0	0.00	0	0.000
908	A	0	0	0.00	0	0.000
909	A	17	11	1.00	26	0.423
910	A	16	11	1.00	26	0.423
911	A	15	8	1.00	24	0.333
912	A	17	8	1.00	23	0.348
913	A	0	0	0.00	0	0.000
914	A	0	0	0.00	0	0.000
915	A	0	0	0.00	0	0.000
916	A	0	0	0.00	0	0.000
917	A	0	0	0.00	0	0.000
918	A	0	0	0.00	0	0.000
919	A	0	0	0.00	0	0.000
920	A	0	0	0.00	0	0.000
921	A	0	0	0.00	0	0.000
922	A	0	0	0.00	0	0.000
923	A	0	0	0.00	0	0.000
924	A	0	0	0.00	0	0.000
925	A	0	0	0.00	0	0.000
926	A	0	0	0.00	0	0.000
927	A	0	0	0.00	0	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
928	A	1	1	1.00	21	0.048
929	A	0	0	0.00	0	0.000
930	A	0	0	0.00	0	0.000
931	A	0	0	0.00	0	0.000
932	A	5	4	1.00	24	0.167
933	A	5	5	1.00	22	0.227
934	A	5	4	1.00	21	0.190
935	A	0	0	0.00	0	0.000
936	A	0	0	0.00	0	0.000
937	A	0	0	0.00	0	0.000
938	A	7	4	1.00	24	0.167
939	A	7	4	1.00	24	0.167
940	A	5	4	1.00	24	0.167
941	A	7	4	1.00	22	0.182
942	A	7	4	1.00	21	0.190
943	A	0	0	0.00	0	0.000
944	A	0	0	0.00	0	0.000
945	A	0	0	0.00	0	0.000
946	A	0	0	0.00	0	0.000
947	A	0	0	0.00	0	0.000
948	A	0	0	0.00	0	0.000
949	A	0	0	0.00	0	0.000
950	A	0	0	0.00	0	0.000
951	A	0	0	0.00	0	0.000
952	A	0	0	0.00	0	0.000
953	A	0	0	0.00	0	0.000
954	A	0	0	0.00	0	0.000
955	A	0	0	0.00	0	0.000
956	A	0	0	0.00	0	0.000
957	A	0	0	0.00	0	0.000
958	A	0	0	0.00	0	0.000
959	A	0	0	0.00	0	0.000
960	A	0	0	0.00	0	0.000
961	A	0	0	0.00	0	0.000
962	A	4	4	1.00	24	0.167
963	A	4	4	1.00	23	0.174

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
964	A	0	0	0.00	0	0.000
965	A	0	0	0.00	0	0.000
966	A	0	0	0.00	0	0.000
967	A	8	5	1.00	26	0.192
968	A	8	5	1.00	26	0.192
969	A	8	5	1.00	24	0.208
970	A	8	5	1.00	23	0.217
971	A	0	0	0.00	0	0.000
972	A	0	0	0.00	0	0.000
973	A	0	0	0.00	0	0.000
974	A	0	0	0.00	0	0.000
975	A	0	0	0.00	0	0.000
976	A	0	0	0.00	0	0.000
977	A	0	0	0.00	0	0.000
978	A	0	0	0.00	0	0.000
979	A	0	0	0.00	0	0.000
980	A	0	0	0.00	0	0.000
981	A	0	0	0.00	0	0.000
982	A	0	0	0.00	0	0.000
983	A	0	0	0.00	0	0.000
984	A	0	0	0.00	0	0.000
985	A	0	0	0.00	0	0.000
986	A	1	1	1.00	21	0.048
987	A	0	0	0.00	0	0.000
988	A	0	0	0.00	0	0.000
989	A	0	0	0.00	0	0.000
990	A	0	0	0.00	0	0.000
991	A	6	6	1.00	24	0.250
992	A	7	6	1.00	22	0.273
993	A	6	6	1.00	21	0.286
994	A	0	0	0.00	0	0.000
995	A	0	0	0.00	0	0.000
996	A	0	0	0.00	0	0.000
997	A	0	0	0.00	0	0.000
998	A	0	0	0.00	0	0.000
999	A	13	6	1.00	24	0.250

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1000	A	15	5	1.00	24	0.208
1001	A	13	7	1.00	22	0.318
1002	A	8	5	1.00	21	0.238
1003	A	0	0	0.00	0	0.000
1004	A	0	0	0.00	0	0.000
1005	A	0	0	0.00	0	0.000
1006	A	0	0	0.00	0	0.000
1007	A	0	0	0.00	0	0.000
1008	A	0	0	0.00	0	0.000
1009	A	0	0	0.00	0	0.000
1010	A	0	0	0.00	0	0.000
1011	A	0	0	0.00	0	0.000
1012	A	0	0	0.00	0	0.000
1013	A	0	0	0.00	0	0.000
1014	A	0	0	0.00	0	0.000
1015	A	0	0	0.00	0	0.000
1016	A	0	0	0.00	0	0.000
1017	A	0	0	0.00	0	0.000
1018	A	0	0	0.00	0	0.000
1019	A	0	0	0.00	0	0.000
1020	A	0	0	0.00	0	0.000
1021	A	0	0	0.00	0	0.000
1022	A	0	0	0.00	0	0.000
1023	A	0	0	0.00	0	0.000
1024	A	0	0	0.00	0	0.000
1025	A	0	0	0.00	0	0.000
1026	A	0	0	0.00	0	0.000
1027	A	5	5	1.00	24	0.208
1028	A	5	5	1.00	23	0.217
1029	A	0	0	0.00	0	0.000
1030	A	0	0	0.00	0	0.000
1031	A	0	0	0.00	0	0.000
1032	A	0	0	0.00	0	0.000
1033	A	0	0	0.00	0	0.000
1034	A	9	6	1.00	26	0.231
1035	A	17	7	1.00	26	0.269

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1036	A	17	9	1.00	24	0.375
1037	A	9	6	1.00	23	0.261
1038	A	0	0	0.00	0	0.000
1039	A	0	0	0.00	0	0.000
1040	A	0	0	0.00	0	0.000
1041	A	0	0	0.00	0	0.000
1042	A	0	0	0.00	0	0.000
1043	A	0	0	0.00	0	0.000
1044	A	0	0	0.00	0	0.000
1045	A	0	0	0.00	0	0.000
1046	A	0	0	0.00	0	0.000
1047	A	0	0	0.00	0	0.000
1048	A	0	0	0.00	0	0.000
1049	A	0	0	0.00	0	0.000
1050	A	0	0	0.00	0	0.000
1051	A	0	0	0.00	0	0.000
1052	A	0	0	0.00	0	0.000
1053	A	0	0	0.00	0	0.000
1054	A	0	0	0.00	0	0.000
1055	A	0	0	0.00	0	0.000
1056	A	1	1	1.00	21	0.048
1057	A	0	0	0.00	0	0.000
1058	A	0	0	0.00	0	0.000
1059	A	0	0	0.00	0	0.000
1060	A	8	7	1.00	24	0.292
1061	A	6	6	1.00	22	0.273
1062	A	8	7	1.00	21	0.333
1063	A	0	0	0.00	0	0.000
1064	A	0	0	0.00	0	0.000
1065	A	0	0	0.00	0	0.000
1066	A	0	0	0.00	0	0.000
1067	A	0	0	0.00	0	0.000
1068	A	24	6	1.00	24	0.250
1069	A	27	7	1.00	24	0.292
1070	A	24	6	1.00	22	0.273
1071	A	14	8	1.00	21	0.381

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1072	A	0	0	0.00	0	0.000
1073	A	0	0	0.00	0	0.000
1074	A	0	0	0.00	0	0.000
1075	A	0	0	0.00	0	0.000
1076	A	0	0	0.00	0	0.000
1077	A	0	0	0.00	0	0.000
1078	A	0	0	0.00	0	0.000
1079	A	0	0	0.00	0	0.000
1080	A	0	0	0.00	0	0.000
1081	A	0	0	0.00	0	0.000
1082	A	0	0	0.00	0	0.000
1083	A	0	0	0.00	0	0.000
1084	A	0	0	0.00	0	0.000
1085	A	0	0	0.00	0	0.000
1086	A	0	0	0.00	0	0.000
1087	A	0	0	0.00	0	0.000
1088	A	0	0	0.00	0	0.000
1089	A	0	0	0.00	0	0.000
1090	A	0	0	0.00	0	0.000
1091	A	0	0	0.00	0	0.000
1092	A	0	0	0.00	0	0.000
1093	A	0	0	0.00	0	0.000
1094	A	0	0	0.00	0	0.000
1095	A	0	0	0.00	0	0.000
1096	A	6	6	1.00	24	0.250
1097	A	6	6	1.00	23	0.261
1098	A	0	0	0.00	0	0.000
1099	A	0	0	0.00	0	0.000
1100	A	0	0	0.00	0	0.000
1101	A	0	0	0.00	0	0.000
1102	A	0	0	0.00	0	0.000
1103	A	18	8	1.00	26	0.308
1104	A	27	10	1.00	26	0.385
1105	A	27	8	1.00	24	0.333
1106	A	18	10	1.00	23	0.435
1107	A	0	0	0.00	0	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1108	A	0	0	0.00	0	0.000
1109	A	0	0	0.00	0	0.000
1110	A	0	0	0.00	0	0.000
1111	A	0	0	0.00	0	0.000
1112	A	1	1	1.00	19	0.053
1113	A	0	0	0.00	0	0.000
1114	A	5	5	1.00	19	0.263
1115	A	4	4	1.00	19	0.210
1116	A	4	3	1.00	17	0.176
1117	A	5	4	1.00	16	0.250
1118	A	8	6	1.00	19	0.316
1119	A	4	4	1.00	19	0.210
1120	A	8	6	1.00	19	0.316
1121	A	5	5	1.00	19	0.263
1122	A	5	6	1.00	19	0.316
1123	A	5	5	1.00	19	0.263
1124	A	6	6	1.00	19	0.316
1125	A	4	5	1.00	21	0.238
1126	A	5	5	1.00	21	0.238
1127	A	4	3	1.00	19	0.158
1128	A	5	5	1.00	18	0.278
1129	A	12	7	1.00	21	0.333
1130	A	4	4	1.00	21	0.190
1131	A	11	7	1.00	21	0.333
1132	A	5	5	1.00	21	0.238
1133	A	12	6	1.00	21	0.286
1134	A	5	5	1.00	21	0.238
1135	A	5	5	1.00	21	0.238
1136	A	5	5	1.00	21	0.238
1137	A	8	7	1.19	21	0.333
1138	A	5	5	1.00	21	0.238
1139	A	4	3	1.00	19	0.158
1140	A	4	4	1.00	18	0.222
1141	A	16	7	1.00	21	0.333
1142	A	4	4	1.00	21	0.190
1143	A	15	8	1.00	21	0.381

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1144	A	5	5	1.00	21	0.238
1145	A	15	7	1.00	21	0.333
1146	A	5	5	1.00	21	0.238
1147	A	17	6	1.00	21	0.286
1148	A	5	5	1.00	21	0.238
1149	A	5	5	1.00	21	0.238
1150	A	4	4	1.00	14	0.286
1151	A	14	9	1.00	21	0.429
1152	A	10	5	1.00	19	0.263
1153	A	15	8	1.00	21	0.381
1154	A	19	12	1.00	21	0.571
1155	A	23	10	1.00	21	0.476
1156	A	19	7	1.00	18	0.389
1157	A	25	13	1.00	21	0.619
1158	A	16	9	1.00	21	0.429
1159	A	4	4	1.00	19	0.210
1160	A	19	11	1.00	21	0.524
1161	A	22	13	1.00	21	0.619
1162	A	45	14	1.00	21	0.667
1163	A	24	12	1.00	18	0.667
1164	A	50	17	1.00	21	0.810
1165	A	21	11	1.00	21	0.524
1166	A	6	6	1.00	21	0.286
1167	A	5	5	1.00	19	0.263
1168	A	24	13	1.00	21	0.619
1169	A	27	15	1.00	21	0.714
1170	A	49	15	1.00	21	0.714
1171	A	23	11	1.00	18	0.611
1172	A	73	19	1.00	21	0.905
1173	A	9	10	1.00	23	0.435
1174	A	0	0	0.00	0	0.000
1175	A	7	7	1.00	21	0.333
1176	A	0	0	0.00	0	0.000
1177	A	0	0	0.00	0	0.000
1178	A	0	0	0.00	0	0.000
1179	A	0	0	0.00	0	0.000

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1180	A	9	8	1.00	23	0.348
1181	A	0	0	0.00	0	0.000
1182	A	10	9	1.00	23	0.391
1183	A	10	10	1.00	23	0.435
1184	A	0	0	0.00	0	0.000
1185	A	8	8	1.00	21	0.381
1186	A	0	0	0.00	0	0.000
1187	A	0	0	0.00	0	0.000
1188	A	0	0	0.00	0	0.000
1189	A	0	0	0.00	0	0.000
1190	A	0	0	0.00	0	0.000
1191	A	0	0	0.00	0	0.000
1192	A	10	9	1.00	23	0.391
1193	A	11	10	1.00	23	0.435
1194	A	0	0	0.00	0	0.000
1195	A	9	8	1.00	21	0.381
1196	A	0	0	0.00	0	0.000
1197	A	0	0	0.00	0	0.000
1198	A	0	0	0.00	0	0.000
1199	A	0	0	0.00	0	0.000
1200	A	0	0	0.00	0	0.000
1201	A	8	10	1.00	23	0.435
1202	A	0	0	0.00	0	0.000
1203	A	6	6	1.00	21	0.286
1204	A	0	0	0.00	0	0.000
1205	A	0	0	0.00	0	0.000
1206	A	7	6	1.00	23	0.261
1207	A	0	0	0.00	0	0.000
1208	A	9	9	1.00	23	0.391
1209	A	7	9	1.00	23	0.391
1210	A	0	0	0.00	0	0.000
1211	A	3	3	1.00	21	0.143
1212	A	5	6	1.00	20	0.300
1213	A	0	0	0.00	0	0.000
1214	A	8	8	1.00	23	0.348
1215	A	0	0	0.00	0	0.000

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	number of rules / integrand leaf size
1216	A	14	10	1.00	23	0.435
1217	A	0	0	0.00	0	0.000
1218	A	6	7	1.00	23	0.304
1219	A	5	6	1.00	23	0.261
1220	A	4	4	1.00	21	0.190
1221	A	7	9	1.00	20	0.450
1222	A	0	0	0.00	0	0.000
1223	A	13	12	1.00	23	0.522
1224	A	0	0	0.00	0	0.000
1225	A	18	12	1.00	23	0.522
1226	A	8	9	1.00	16	0.562
1227	A	8	9	1.00	16	0.562
1228	A	4	4	0.99	21	0.190
1229	A	4	4	0.98	21	0.190
1230	A	3	4	1.00	19	0.210
1231	A	0	0	0.00	0	0.000
1232	A	0	0	0.00	0	0.000
1233	A	0	0	0.00	0	0.000
1234	A	0	0	0.00	0	0.000
1235	A	0	0	0.00	0	0.000
1236	A	0	0	0.00	0	0.000
1237	A	0	0	0.00	0	0.000
1238	A	0	0	0.00	0	0.000
1239	A	0	0	0.00	0	0.000
1240	A	0	0	0.00	0	0.000
1241	A	4	5	1.00	25	0.200
1242	A	0	0	0.00	0	0.000
1243	A	8	9	1.00	25	0.360
1244	A	0	0	0.00	0	0.000
1245	A	10	9	1.00	25	0.360
1246	A	0	0	0.00	0	0.000
1247	A	29	8	1.00	21	0.381
1248	A	25	10	1.00	21	0.476
1249	A	19	8	1.00	19	0.421
1250	A	16	10	1.00	18	0.556
1251	A	14	10	1.00	21	0.476

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Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1252	A	11	10	1.00	21	0.476
1253	A	16	12	1.00	21	0.571
1254	A	50	8	1.00	23	0.348
1255	A	44	10	1.00	23	0.435
1256	A	35	8	1.00	21	0.381
1257	A	30	11	1.00	20	0.550
1258	A	25	12	1.00	23	0.522
1259	A	20	13	1.00	23	0.565
1260	A	22	15	1.00	23	0.652
1261	A	11	7	1.00	23	0.304
1262	A	10	8	1.00	23	0.348
1263	A	4	2	1.00	21	0.095
1264	A	4	2	1.00	20	0.100
1265	A	12	7	1.00	23	0.304
1266	A	9	7	1.00	23	0.304
1267	A	21	13	1.00	23	0.565
1268	A	33	12	1.00	23	0.522
1269	A	38	12	1.00	23	0.522
1270	A	27	10	1.00	21	0.476
1271	A	32	11	1.00	20	0.550
1272	A	39	16	1.00	23	0.696
1273	A	42	15	1.00	23	0.652
1274	A	47	22	1.00	23	0.956
1275	A	24	14	1.00	12	1.167
1276	A	14	12	1.00	12	1.000
1277	A	19	12	1.00	12	1.000
1278	A	7	8	1.00	10	0.800
1279	A	8	8	1.00	9	0.889
1280	A	12	7	1.00	12	0.583
1281	A	8	12	1.00	12	1.000
1282	A	6	6	1.00	12	0.500
1283	A	18	15	1.00	12	1.250
1284	A	12	8	1.00	12	0.667
1285	A	26	15	1.00	12	1.250
1286	A	26	15	1.00	26	0.577
1287	A	14	11	1.00	26	0.423

Continued on next page

Table 2.1 – continued from previous page

#	grade	number of steps used	number of unique rules	normalized antiderivative leaf size	integrand leaf size	$\frac{\text{number of rules}}{\text{integrand leaf size}}$
1288	A	21	15	1.00	26	0.577
1289	A	7	7	1.00	24	0.292
1290	A	9	8	1.00	23	0.348
1291	A	18	9	1.00	26	0.346
1292	A	8	8	0.92	26	0.308
1293	A	10	9	1.00	26	0.346
1294	A	17	16	0.98	26	0.615
1295	A	15	10	1.00	26	0.385
1296	A	26	18	0.99	26	0.692
1297	A	21	16	1.00	22	0.727
1298	A	28	12	1.00	21	0.571
1299	A	0	0	0.00	0	0.000
1300	A	28	14	1.00	24	0.583
1301	A	22	18	1.00	24	0.750

Chapter 3

Listing of integrals

3.1 $\int x^3(d+icdx)\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=117

$$\frac{1}{5}icdx^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)-\frac{bd\tan^{-1}(cx)}{4c^4}+\frac{bdx}{4c^3}+\frac{ibdx^2}{10c^2}-\frac{ibd\log\left(c^2x^2+1\right)}{10c^4}-\frac{bdx^3}{12c}-\frac{1}{20}ibc$$

```
[Out] 1/4*b*d*x/c^3+1/10*I*b*d*x^2/c^2-1/12*b*d*x^3/c-1/20*I*b*d*x^4-1/4*b*d*arct
an(c*x)/c^4+1/4*d*x^4*(a+b*arctan(c*x))+1/5*I*c*d*x^5*(a+b*arctan(c*x))-1/1
0*I*b*d*ln(c^2*x^2+1)/c^4
```

Rubi [A] time = 0.10, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 4872, 12, 801, 635, 203, 260}

$$\frac{1}{5}icdx^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{ibdx^2}{10c^2}-\frac{ibd\log\left(c^2x^2+1\right)}{10c^4}+\frac{bdx}{4c^3}-\frac{bd\tan^{-1}(cx)}{4c^4}-\frac{bdx^3}{12c}-\frac{1}{20}ibc$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (b*d*x)/(4*c^3) + ((I/10)*b*d*x^2)/c^2 - (b*d*x^3)/(12*c) - (I/20)*b*d*x^4
- (b*d*ArcTan[c*x])/(4*c^4) + (d*x^4*(a + b*ArcTan[c*x]))/4 + (I/5)*c*d*x^5
*(a + b*ArcTan[c*x]) - ((I/10)*b*d*Log[1 + c^2*x^2])/c^4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^3(d+icdx)\left(a+b\tan^{-1}(cx)\right)dx = \frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}icdx^5\left(a+b\tan^{-1}(cx)\right)-(bc)\int\frac{dx^4(5+4icx)}{20\left(1+c^2x^2\right)}$$

$$= \frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}icdx^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{20}(bcd)\int\frac{x^4(5+4i}{1+c^2x^2}$$

$$= \frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}icdx^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{20}(bcd)\int\left(-\frac{5}{c^4}-\frac{4i}{c^3}\right.$$

$$= \frac{bdx}{4c^3}+\frac{ibdx^2}{10c^2}-\frac{bdx^3}{12c}-\frac{1}{20}ibdx^4+\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}icdx^5\left(a+b\right.$$

$$= \frac{bdx}{4c^3}+\frac{ibdx^2}{10c^2}-\frac{bdx^3}{12c}-\frac{1}{20}ibdx^4+\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}icdx^5\left(a+b\right.$$

$$= \frac{bdx}{4c^3}+\frac{ibdx^2}{10c^2}-\frac{bdx^3}{12c}-\frac{1}{20}ibdx^4-\frac{bd\tan^{-1}(cx)}{4c^4}+\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+$$

Mathematica [A] time = 0.08, size = 98, normalized size = 0.84

$$\frac{d\left(3ac^4x^4(5+4icx)-6ib\log\left(c^2x^2+1\right)+3b\left(4ic^5x^5+5c^4x^4-5\right)\tan^{-1}(cx)+bcx\left(-3ic^3x^3-5c^2x^2+6icx+15\right)\right)}{60c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d*(3*a*c^4*x^4*(5 + (4*I)*c*x) + b*c*x*(15 + (6*I)*c*x - 5*c^2*x^2 - (3*I)
*c^3*x^3) + 3*b*(-5 + 5*c^4*x^4 + (4*I)*c^5*x^5)*ArcTan[c*x] - (6*I)*b*Log[
1 + c^2*x^2]))/(60*c^4)
```

fricas [A] time = 2.50, size = 124, normalized size = 1.06

$$\frac{24i\,ac^5dx^5+6\,(5\,a-i\,b)c^4dx^4-10\,bc^3dx^3+12i\,bc^2dx^2+30\,bcdx-27i\,bd\log\left(\frac{cx+i}{c}\right)+3i\,bd\log\left(\frac{cx-i}{c}\right)-\left(12\,bc^5d\right.}{120\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/120*(24*I*a*c^5*d*x^5 + 6*(5*a - I*b)*c^4*d*x^4 - 10*b*c^3*d*x^3 + 12*I*b
*c^2*d*x^2 + 30*b*c*d*x - 27*I*b*d*log((c*x + I)/c) + 3*I*b*d*log((c*x - I)
/c) - (12*b*c^5*d*x^5 - 15*I*b*c^4*d*x^4)*log(-(c*x + I)/(c*x - I)))/c^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 108, normalized size = 0.92

$$\frac{icda\,x^5}{5}+\frac{da\,x^4}{4}+\frac{icdb\arctan(cx)\,x^5}{5}+\frac{db\arctan(cx)\,x^4}{4}+\frac{bdx}{4c^3}-\frac{ibd\,x^4}{20}-\frac{bd\,x^3}{12c}+\frac{ibd\,x^2}{10c^2}-\frac{ibd\ln\left(c^2x^2+1\right)}{10c^4}-\frac{bd\arct}{4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+I*c*d*x)*(a+b*arctan(c*x)),x)
```

```
[Out] 1/5*I*c*d*a*x^5+1/4*d*a*x^4+1/5*I*c*d*b*arctan(c*x)*x^5+1/4*d*b*arctan(c*x)
*x^4+1/4*b*d*x/c^3-1/20*I*b*d*x^4-1/12*b*d*x^3/c+1/10*I*b*d*x^2/c^2-1/10*I*
b*d*ln(c^2*x^2+1)/c^4-1/4*b*d*arctan(c*x)/c^4
```

maxima [A] time = 0.41, size = 109, normalized size = 0.93

$$\frac{1}{5}i\,acdx^5+\frac{1}{4}\,adx^4+\frac{1}{20}i\left(4\,x^5\arctan(cx)-c\left(\frac{c^2x^4-2\,x^2}{c^4}+\frac{2\,\log\left(c^2x^2+1\right)}{c^6}\right)\right)bcd+\frac{1}{12}\left(3\,x^4\arctan(cx)-c\left(\frac{c^2x}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*I*a*c*d*x^5 + 1/4*a*d*x^4 + 1/20*I*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2
*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*c*d + 1/12*(3*x^4*arctan(c*x) - c*((
c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*d
```

mupad [B] time = 0.74, size = 109, normalized size = 0.93

$$-\frac{\frac{d\left(15\,b\,\mathrm{atan}(c\,x)+b\,\ln\left(c^2\,x^2+1\right)\,6\mathrm{i}\right)}{60}-\frac{b\,c\,d\,x}{4}+\frac{b\,c^3\,d\,x^3}{12}-\frac{b\,c^2\,d\,x^2\,1\mathrm{i}}{10}}{c^4}+\frac{d\,\left(15\,a\,x^4+15\,b\,x^4\,\mathrm{atan}\,(c\,x)-b\,x^4\,3\mathrm{i}\right)}{60}+\frac{c\,d\,\left(a\,x^5\,12\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + c*d*x*1i),x)
```

```
[Out] (d*(15*a*x^4 - b*x^4*3i + 15*b*x^4*atan(c*x)))/60 - ((d*(15*b*atan(c*x) + b
*log(c^2*x^2 + 1)*6i))/60 - (b*c*d*x)/4 - (b*c^2*d*x^2*1i)/10 + (b*c^3*d*x^
3)/12)/c^4 + (c*d*(a*x^5*12i + b*x^5*atan(c*x)*12i))/60
```

sympy [A] time = 3.40, size = 184, normalized size = 1.57

$$\frac{iacdx^5}{5}-\frac{bdx^3}{12c}+\frac{ibdx^2}{10c^2}+\frac{bdx}{4c^3}+\frac{bd\left(\frac{i\log\left(25bcdx-25ibd\right)}{40}-\frac{11i\log\left(25bcdx+25ibd\right)}{60}\right)}{c^4}+x^4\left(\frac{ad}{4}-\frac{ibd}{20}\right)+\left(\frac{bcdx^5}{10}-\frac{ibdx^4}{8}\right)\log\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+I*c*d*x)*(a+b*atan(c*x)),x)
```

```
[Out] I*a*c*d*x**5/5 - b*d*x**3/(12*c) + I*b*d*x**2/(10*c**2) + b*d*x/(4*c**3) +
b*d*(I*log(25*b*c*d*x - 25*I*b*d)/40 - 11*I*log(25*b*c*d*x + 25*I*b*d)/60)/
c**4 + x**4*(a*d/4 - I*b*d/20) + (b*c*d*x**5/10 - I*b*d*x**4/8)*log(I*c*x +
 1) - (12*b*c**5*d*x**5 - 15*I*b*c**4*d*x**4 + 5*I*b*d)*log(-I*c*x + 1)/(12
0*c**4)
```

3.2 $\int x^2(d+icdx)\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=105

$$\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)-\frac{ibd\tan^{-1}(cx)}{4c^3}+\frac{ibdx}{4c^2}+\frac{bd\log\left(c^2x^2+1\right)}{6c^3}-\frac{bdx^2}{6c}-\frac{1}{12}ibdx^3$$

```
[Out] 1/4*I*b*d*x/c^2-1/6*b*d*x^2/c-1/12*I*b*d*x^3-1/4*I*b*d*arctan(c*x)/c^3+1/3*
d*x^3*(a+b*arctan(c*x))+1/4*I*c*d*x^4*(a+b*arctan(c*x))+1/6*b*d*ln(c^2*x^2+
1)/c^3
```

Rubi [A] time = 0.09, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 4872, 12, 801, 635, 203, 260}

$$\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{bd\log\left(c^2x^2+1\right)}{6c^3}+\frac{ibdx}{4c^2}-\frac{ibd\tan^{-1}(cx)}{4c^3}-\frac{bdx^2}{6c}-\frac{1}{12}ibdx^3$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] ((I/4)*b*d*x)/c^2 - (b*d*x^2)/(6*c) - (I/12)*b*d*x^3 - ((I/4)*b*d*ArcTan[c*
x])/c^3 + (d*x^3*(a + b*ArcTan[c*x]))/3 + (I/4)*c*d*x^4*(a + b*ArcTan[c*x])
 + (b*d*Log[1 + c^2*x^2])/(6*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^2(d+icdx)\left(a+b\tan^{-1}(cx)\right)dx = \frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)-(bc)\int\frac{dx^3(4+3icx)}{12\left(1+c^2x^2\right)}$$
$$=\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)-\frac{1}{12}(bcd)\int\frac{x^3(4+3ic}{1+c^2x^2}$$
$$=\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)-\frac{1}{12}(bcd)\int\left(-\frac{3i}{c^3}+\frac{4x}{c^2}\right.$$
$$=\frac{ibdx}{4c^2}-\frac{bdx^2}{6c}-\frac{1}{12}ibdx^3+\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx\right.$$
$$=\frac{ibdx}{4c^2}-\frac{bdx^2}{6c}-\frac{1}{12}ibdx^3+\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx\right.$$
$$=\frac{ibdx}{4c^2}-\frac{bdx^2}{6c}-\frac{1}{12}ibdx^3-\frac{ibd\tan^{-1}(cx)}{4c^3}+\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}icdx$$

Mathematica [A] time = 0.06, size = 88, normalized size = 0.84

$$\frac{d\left(ac^3x^3(4+3icx)+bcx\left(-ic^2x^2-2cx+3i\right)+2b\log\left(c^2x^2+1\right)+b\left(3ic^4x^4+4c^3x^3-3i\right)\tan^{-1}(cx)\right)}{12c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d*(a*c^3*x^3*(4 + (3*I)*c*x) + b*c*x*(3*I - 2*c*x - I*c^2*x^2) + b*(-3*I +
 4*c^3*x^3 + (3*I)*c^4*x^4)*ArcTan[c*x] + 2*b*Log[1 + c^2*x^2]))/(12*c^3)
```

fricas [A] time = 0.87, size = 113, normalized size = 1.08

$$\frac{6i\,ac^4dx^4+2\,(4\,a-i\,b)c^3dx^3-4\,bc^2dx^2+6i\,bcdx+7\,bd\log\left(\frac{cx+i}{c}\right)+bd\log\left(\frac{cx-i}{c}\right)-\left(3\,bc^4dx^4-4i\,bc^3dx^3\right)\log\left(-\right.}{24\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/24*(6*I*a*c^4*d*x^4 + 2*(4*a - I*b)*c^3*d*x^3 - 4*b*c^2*d*x^2 + 6*I*b*c*d
*x + 7*b*d*log((c*x + I)/c) + b*d*log((c*x - I)/c) - (3*b*c^4*d*x^4 - 4*I*b
*c^3*d*x^3)*log(-(c*x + I)/(c*x - I)))/c^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 98, normalized size = 0.93

$$\frac{icda\,x^4}{4}+\frac{da\,x^3}{3}+\frac{icdb\arctan(cx)\,x^4}{4}+\frac{db\arctan(cx)\,x^3}{3}+\frac{ibdx}{4c^2}-\frac{ibd\,x^3}{12}-\frac{bd\,x^2}{6c}+\frac{bd\ln\left(c^2x^2+1\right)}{6c^3}-\frac{ibd\arctan(cx)}{4c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+I*c*d*x)*(a+b*arctan(c*x)),x)
```

```
[Out] 1/4*I*c*d*a*x^4+1/3*d*a*x^3+1/4*I*c*d*b*arctan(c*x)*x^4+1/3*d*b*arctan(c*x)
*x^3+1/4*I*b*d*x/c^2-1/12*I*b*d*x^3-1/6*b*d*x^2/c+1/6*b*d*ln(c^2*x^2+1)/c^3
-1/4*I*b*d*arctan(c*x)/c^3
```

maxima [A] time = 0.41, size = 99, normalized size = 0.94

$$\frac{1}{4}i\,acdx^4+\frac{1}{3}\,adx^3+\frac{1}{12}i\left(3\,x^4\arctan(cx)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3\,\arctan(cx)}{c^5}\right)\right)bcd+\frac{1}{6}\left(2\,x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*I*a*c*d*x^4 + 1/3*a*d*x^3 + 1/12*I*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3
*x)/c^4 + 3*arctan(c*x)/c^5))*b*c*d + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 -
 log(c^2*x^2 + 1)/c^4))*b*d
```

mupad [B] time = 0.71, size = 99, normalized size = 0.94

$$-\frac{\frac{d\left(-2\,b\,\ln\left(c^2\,x^2+1\right)+b\,\mathrm{atan}(c\,x)\,3\mathrm{i}\right)}{12}+\frac{b\,c^2\,d\,x^2}{6}-\frac{b\,c\,d\,x\,1\mathrm{i}}{4}}{c^3}+\frac{d\,\left(4\,a\,x^3+4\,b\,x^3\,\mathrm{atan}(c\,x)-b\,x^3\,1\mathrm{i}\right)}{12}+\frac{c\,d\,\left(a\,x^4\,3\mathrm{i}+b\,x^4\,\mathrm{atan}\right.}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + c*d*x*1i),x)
```

```
[Out] (d*(4*a*x^3 - b*x^3*1i + 4*b*x^3*atan(c*x)))/12 - ((d*(b*atan(c*x)*3i - 2*b
*log(c^2*x^2 + 1)))/12 - (b*c*d*x*1i)/4 + (b*c^2*d*x^2)/6)/c^3 + (c*d*(a*x^
4*3i + b*x^4*atan(c*x)*3i))/12
```

sympy [A] time = 3.08, size = 167, normalized size = 1.59

$$\frac{iacdx^4}{4}-\frac{bdx^2}{6c}+\frac{ibdx}{4c^2}+\frac{bd\left(\frac{\log(11bcdx-11ibd)}{24}+\frac{9\log(11bcdx+11ibd)}{40}\right)}{c^3}+x^3\left(\frac{ad}{3}-\frac{ibd}{12}\right)+\left(\frac{bcdx^4}{8}-\frac{ibdx^3}{6}\right)\log(icx+1)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+I*c*d*x)*(a+b*atan(c*x)),x)
```

```
[Out] I*a*c*d*x**4/4 - b*d*x**2/(6*c) + I*b*d*x/(4*c**2) + b*d*(log(11*b*c*d*x -
11*I*b*d)/24 + 9*log(11*b*c*d*x + 11*I*b*d)/40)/c**3 + x**3*(a*d/3 - I*b*d/
12) + (b*c*d*x**4/8 - I*b*d*x**3/6)*log(I*c*x + 1) - (15*b*c**4*d*x**4 - 20
*I*b*c**3*d*x**3 - 8*b*d)*log(-I*c*x + 1)/(120*c**3)
```

3.3 $\int x(d+icdx)\left(a+b\tan^{-1}(cx)\right)dx$

Optimal. Leaf size=91

$$\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{ibd\log\left(c^2x^2+1\right)}{6c^2}+\frac{bd\tan^{-1}(cx)}{2c^2}-\frac{bdx}{2c}-\frac{1}{6}ibdx^2$$

```
[Out] -1/2*b*d*x/c-1/6*I*b*d*x^2+1/2*b*d*arctan(c*x)/c^2+1/2*d*x^2*(a+b*arctan(c*
x))+1/3*I*c*d*x^3*(a+b*arctan(c*x))+1/6*I*b*d*ln(c^2*x^2+1)/c^2
```

Rubi [A] time = 0.08, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {43, 4872, 12, 801, 635, 203, 260}

$$\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{ibd\log\left(c^2x^2+1\right)}{6c^2}+\frac{bd\tan^{-1}(cx)}{2c^2}-\frac{bdx}{2c}-\frac{1}{6}ibdx^2$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*d*x)/(2*c) - (I/6)*b*d*x^2 + (b*d*ArcTan[c*x])/(2*c^2) + (d*x^2*(a + b*
ArcTan[c*x]))/2 + (I/3)*c*d*x^3*(a + b*ArcTan[c*x]) + ((I/6)*b*d*Log[1 + c^
2*x^2])/c^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x(d+icdx)\left(a+b\tan^{-1}(cx)\right)\,dx = \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)-(bc)\int\frac{dx^2(3+2ic}{6+6c^2x^2}$$

$$= \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)-(bcd)\int\frac{x^2(3+2ic}{6+6c^2x^2}$$

$$= \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)-(bcd)\int\left(\frac{1}{2c^2}+\frac{ix}{3c}\right.$$

$$= -\frac{bdx}{2c}-\frac{1}{6}ibdx^2+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)-$$

$$= -\frac{bdx}{2c}-\frac{1}{6}ibdx^2+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)+($$

$$= -\frac{bdx}{2c}-\frac{1}{6}ibdx^2+\frac{bd\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}icdx^3\left(a+\right.$$

Mathematica [A] time = 0.05, size = 76, normalized size = 0.84

$$\frac{d\left(cx(acx(3+2icx)+b(-3-icx))+ib\log\left(c^2x^2+1\right)+b\left(2ic^3x^3+3c^2x^2+3\right)\tan^{-1}(cx)\right)}{6c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d*(c*x*(b*(-3 - I*c*x) + a*c*x*(3 + (2*I)*c*x)) + b*(3 + 3*c^2*x^2 + (2*I)
*c^3*x^3)*ArcTan[c*x] + I*b*Log[1 + c^2*x^2]))/(6*c^2)
```

fricas [A] time = 1.61, size = 104, normalized size = 1.14

$$\frac{4i\,ac^3dx^3+2\,(3\,a-i\,b)c^2dx^2-6\,bcdx+5i\,bd\log\left(\frac{cx+i}{c}\right)-i\,bd\log\left(\frac{cx-i}{c}\right)-\left(2\,bc^3dx^3-3i\,bc^2dx^2\right)\log\left(-\frac{cx+i}{cx-i}\right)}{12\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/12*(4*I*a*c^3*d*x^3 + 2*(3*a - I*b)*c^2*d*x^2 - 6*b*c*d*x + 5*I*b*d*log((
c*x + I)/c) - I*b*d*log((c*x - I)/c) - (2*b*c^3*d*x^3 - 3*I*b*c^2*d*x^2)*lo
g(-(c*x + I)/(c*x - I)))/c^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 87, normalized size = 0.96

$$\frac{icda\,x^3}{3}+\frac{da\,x^2}{2}+\frac{icdb\arctan(cx)\,x^3}{3}+\frac{db\arctan(cx)\,x^2}{2}-\frac{ibd\,x^2}{6}-\frac{bdx}{2c}+\frac{ibd\ln\left(c^2x^2+1\right)}{6c^2}+\frac{bd\arctan(cx)}{2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+I*c*d*x)*(a+b*arctan(c*x)),x)
```

```
[Out] 1/3*I*c*d*a*x^3+1/2*d*a*x^2+1/3*I*c*d*b*arctan(c*x)*x^3+1/2*d*b*arctan(c*x)
*x^2-1/6*I*b*d*x^2-1/2*b*d*x/c+1/6*I*b*d*ln(c^2*x^2+1)/c^2+1/2*b*d*arctan(c
*x)/c^2
```

maxima [A] time = 0.41, size = 88, normalized size = 0.97

$$\frac{1}{3}i\,acdx^3+\frac{1}{6}i\left(2\,x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)bcd+\frac{1}{2}\,adx^2+\frac{1}{2}\left(x^2\arctan(cx)-c\left(\frac{x}{c^2}-\frac{\arctan(cx)}{c^3}\right)\right)bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/3*I*a*c*d*x^3 + 1/6*I*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/
c^4))*b*c*d + 1/2*a*d*x^2 + 1/2*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c
^3))*b*d
```

mupad [B] time = 0.38, size = 87, normalized size = 0.96

$$\frac{d\,\left(3\,a\,x^2+3\,b\,x^2\,\mathrm{atan}\left(c\,x\right)-b\,x^2\,1\mathrm{i}\right)}{6}+\frac{\frac{d\,\left(3\,b\,\mathrm{atan}\left(c\,x\right)+b\,\ln\left(c^2\,x^2+1\right)\,1\mathrm{i}\right)}{6}-\frac{b\,c\,d\,x}{2}}{c^2}+\frac{c\,d\,\left(a\,x^3\,2\mathrm{i}+b\,x^3\,\mathrm{atan}\left(c\,x\right)\,2\mathrm{i}\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + c*d*x*1i),x)
```

```
[Out] (d*(3*a*x^2 - b*x^2*1i + 3*b*x^2*atan(c*x)))/6 + ((d*(3*b*atan(c*x) + b*log
(c^2*x^2 + 1)*1i))/6 - (b*c*d*x)/2)/c^2 + (c*d*(a*x^3*2i + b*x^3*atan(c*x)*
2i))/6
```

sympy [A] time = 2.89, size = 158, normalized size = 1.74

$$\frac{iacdx^3}{3}-\frac{bdx}{2c}+\frac{bd\left(-\frac{i\log(9bcdx-9ibd)}{12}+\frac{7i\log(9bcdx+9ibd)}{24}\right)}{c^2}+x^2\left(\frac{ad}{2}-\frac{ibd}{6}\right)+\left(\frac{bcdx^3}{6}-\frac{ibdx^2}{4}\right)\log(icx+1)-\frac{\left(4bc^3dx^3-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)*(a+b*atan(c*x)),x)
```

```
[Out] I*a*c*d*x**3/3 - b*d*x/(2*c) + b*d*(-I*log(9*b*c*d*x - 9*I*b*d)/12 + 7*I*lo
g(9*b*c*d*x + 9*I*b*d)/24)/c**2 + x**2*(a*d/2 - I*b*d/6) + (b*c*d*x**3/6 -
I*b*d*x**2/4)*log(I*c*x + 1) - (4*b*c**3*d*x**3 - 6*I*b*c**2*d*x**2 - 3*I*b
*d)*log(-I*c*x + 1)/(24*c**2)
```

3.4 $\int (d+icdx)\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=53

$$-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2c}-\frac{bd\log(cx+i)}{c}-\frac{1}{2}ibdx$$

```
[Out] -1/2*I*b*d*x-1/2*I*d*(1+I*c*x)^2*(a+b*arctan(c*x))/c-b*d*ln(I+c*x)/c
```

Rubi [A] time = 0.03, antiderivative size = 53, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4862, 627, 43}

$$-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2c}-\frac{bd\log(cx+i)}{c}-\frac{1}{2}ibdx$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (-I/2)*b*d*x - ((I/2)*d*(1 + I*c*x)^2*(a + b*ArcTan[c*x]))/c - (b*d*Log[I +
 c*x])/c
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int (d+icdx)\left(a+b\tan^{-1}(cx)\right)\,dx &= -\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2c}+\frac{(ib)\int \frac{(d+icdx)^2}{1+c^2x^2}\,dx}{2d}\\
&= -\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2c}+\frac{(ib)\int \frac{d+icdx}{\frac{1}{d}-\frac{icx}{d}}\,dx}{2d}\\
&= -\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2c}+\frac{(ib)\int \left(-d^2+\frac{2id^2}{i+cx}\right)dx}{2d}\\
&= -\frac{1}{2}ibdx-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2c}-\frac{bd\log(i+cx)}{c}
\end{aligned}$$

Mathematica [A] time = 0.01, size = 84, normalized size = 1.58

$$\frac{1}{2}iacdx^2+adx-\frac{bd\log\left(c^2x^2+1\right)}{2c}+\frac{1}{2}ibcdx^2\tan^{-1}(cx)+bdx\tan^{-1}(cx)+\frac{ibd\tan^{-1}(cx)}{2c}-\frac{1}{2}ibdx$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + I*c*d*x)*(a + b*ArcTan[c*x]),x]
```

```
[Out] a*d*x - (I/2)*b*d*x + (I/2)*a*c*d*x^2 + ((I/2)*b*d*ArcTan[c*x])/c + b*d*x*A
rcTan[c*x] + (I/2)*b*c*d*x^2*ArcTan[c*x] - (b*d*Log[1 + c^2*x^2])/(2*c)
```

fricas [B] time = 0.67, size = 89, normalized size = 1.68

$$\frac{2i\,ac^2dx^2+2\,(2\,a-i\,b)cdx-3\,bd\log\left(\frac{cx+i}{c}\right)-bd\log\left(\frac{cx-i}{c}\right)-\left(bc^2dx^2-2i\,bcdx\right)\log\left(-\frac{cx+i}{cx-i}\right)}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/4*(2*I*a*c^2*d*x^2 + 2*(2*a - I*b)*c*d*x - 3*b*d*log((c*x + I)/c) - b*d*l
og((c*x - I)/c) - (b*c^2*d*x^2 - 2*I*b*c*d*x)*log(-(c*x + I)/(c*x - I)))/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 71, normalized size = 1.34

$$adx+\frac{icda\,x^2}{2}+db\arctan\left(cx\right)x+\frac{icdb\arctan\left(cx\right)x^2}{2}-\frac{ibdx}{2}-\frac{bd\ln\left(c^2x^2+1\right)}{2c}+\frac{idb\arctan\left(cx\right)}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x)),x)
```

```
[Out] a*d*x+1/2*I*c*d*a*x^2+d*b*arctan(c*x)*x+1/2*I*c*d*b*arctan(c*x)*x^2-1/2*I*b
*d*x-1/2*b*d*ln(c^2*x^2+1)/c+1/2*I/c*d*b*arctan(c*x)
```

maxima [A] time = 0.40, size = 73, normalized size = 1.38

$$\frac{1}{2}i\,acdx^2+\frac{1}{2}i\left(x^2\arctan\left(cx\right)-c\left(\frac{x}{c^2}-\frac{\arctan\left(cx\right)}{c^3}\right)\right)bcd+adx+\frac{\left(2\,cx\arctan\left(cx\right)-\log\left(c^2x^2+1\right)\right)bd}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/2*I*a*c*d*x^2 + 1/2*I*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*c
*d + a*d*x + 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d/c
```

mupad [B] time = 0.32, size = 73, normalized size = 1.38

$$\frac{d\,\left(2\,a\,x+2\,b\,x\,\mathrm{atan}\left(c\,x\right)-b\,x\,1\mathrm{i}\right)}{2}+\frac{c\,d\,\left(a\,x^2\,1\mathrm{i}+b\,x^2\,\mathrm{atan}\left(c\,x\right)\,1\mathrm{i}\right)}{2}+\frac{d\,\left(-b\,\ln\left(c^2\,x^2+1\right)+b\,\mathrm{atan}\left(c\,x\right)\,1\mathrm{i}\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + c*d*x*1i),x)
```

```
[Out] (d*(2*a*x - b*x*1i + 2*b*x*atan(c*x)))/2 + (c*d*(a*x^2*1i + b*x^2*atan(c*x)
*1i))/2 + (d*(b*atan(c*x)*1i - b*log(c^2*x^2 + 1)))/(2*c)
```

sympy [B] time = 2.58, size = 128, normalized size = 2.42

$$\frac{iacdx^2}{2}+\frac{bd\left(-\frac{\log\left(bcdx-ibd\right)}{4}-\frac{5\log\left(bcdx+ibd\right)}{12}\right)}{c}+x\left(ad-\frac{ibd}{2}\right)+\left(\frac{bcdx^2}{4}-\frac{ibdx}{2}\right)\log\left(icx+1\right)-\frac{\left(3bc^2dx^2-6ibcdx+4\right.}{12c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x)),x)
```

```
[Out] I*a*c*d*x**2/2 + b*d*(-log(b*c*d*x - I*b*d)/4 - 5*log(b*c*d*x + I*b*d)/12)/
c + x*(a*d - I*b*d/2) + (b*c*d*x**2/4 - I*b*d*x/2)*log(I*c*x + 1) - (3*b*c*
*2*d*x**2 - 6*I*b*c*d*x + 4*b*d)*log(-I*c*x + 1)/(12*c)
```

3.5 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=76

$$iacdx + ad\log(x) - \frac{1}{2}ibd\log\left(c^2x^2+1\right) + \frac{1}{2}ibd\text{Li}_2(-icx) - \frac{1}{2}ibd\text{Li}_2(icx) + ibcdx\tan^{-1}(cx)$$

```
[Out] I*a*c*d*x+I*b*c*d*x*arctan(c*x)+a*d*ln(x)-1/2*I*b*d*ln(c^2*x^2+1)+1/2*I*b*d
*polylog(2,-I*c*x)-1/2*I*b*d*polylog(2,I*c*x)
```

Rubi [A] time = 0.09, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {4876, 4846, 260, 4848, 2391}

$$\frac{1}{2}ibd\text{PolyLog}(2,-icx)-\frac{1}{2}ibd\text{PolyLog}(2,icx)+iacdx+ad\log(x)-\frac{1}{2}ibd\log\left(c^2x^2+1\right)+ibcdx\tan^{-1}(cx)$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] I*a*c*d*x + I*b*c*d*x*ArcTan[c*x] + a*d*Log[x] - (I/2)*b*d*Log[1 + c^2*x^2]
 + (I/2)*b*d*PolyLog[2, (-I)*c*x] - (I/2)*b*d*PolyLog[2, I*c*x]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x}\,dx = \int \left(icd\left(a+b\tan^{-1}(cx)\right)+\frac{d\left(a+b\tan^{-1}(cx)\right)}{x}\right)dx$$
$$= d\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+(icd)\int \left(a+b\tan^{-1}(cx)\right)dx$$
$$= iacdx+ad\log(x)+\frac{1}{2}(ibd)\int \frac{\log(1-icx)}{x}\,dx-\frac{1}{2}(ibd)\int \frac{\log(1+icx)}{x}\,dx$$
$$= iacdx+ibcdx\tan^{-1}(cx)+ad\log(x)+\frac{1}{2}ibd\text{Li}_2(-icx)-\frac{1}{2}ibd\text{Li}_2(icx)-\left(ib\right.$$
$$= iacdx+ibcdx\tan^{-1}(cx)+ad\log(x)-\frac{1}{2}ibd\log\left(1+c^2x^2\right)+\frac{1}{2}ibd\text{Li}_2(-icx$$

Mathematica [A] time = 0.00, size = 76, normalized size = 1.00

$$iacdx+ad\log(x)-\frac{1}{2}ibd\log\left(c^2x^2+1\right)+\frac{1}{2}ibd\text{Li}_2(-icx)-\frac{1}{2}ibd\text{Li}_2(icx)+ibcdx\tan^{-1}(cx)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] I*a*c*d*x + I*b*c*d*x*ArcTan[c*x] + a*d*Log[x] - (I/2)*b*d*Log[1 + c^2*x^2]
 + (I/2)*b*d*PolyLog[2, (-I)*c*x] - (I/2)*b*d*PolyLog[2, I*c*x]
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2i\,acdx+2\,ad-(bcdx-i\,bd)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*I*a*c*d*x + 2*a*d - (b*c*d*x - I*b*d)*log(-(c*x + I)/(c*x -
 I)))/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 113, normalized size = 1.49

$$iacdx+da\ln(cx)+ibcdx\arctan(cx)+db\ln(cx)\arctan(cx)+\frac{idb\ln(cx)\ln(icx+1)}{2}-\frac{idb\ln(cx)\ln(-icx+1)}{2}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))/x,x)
```

```
[Out] I*a*c*d*x+d*a*ln(c*x)+I*b*c*d*x*arctan(c*x)+d*b*ln(c*x)*arctan(c*x)+1/2*I*d
*b*ln(c*x)*ln(1+I*c*x)-1/2*I*d*b*ln(c*x)*ln(1-I*c*x)+1/2*I*d*b*dilog(1+I*c*
x)-1/2*I*d*b*dilog(1-I*c*x)-1/2*I*b*d*ln(c^2*x^2+1)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$i\,acdx + \frac{1}{2}i\left(2\,cx\arctan\left(cx\right) - \log\left(c^2x^2 + 1\right)\right)bd + bd\int \frac{\arctan\left(cx\right)}{x}\,dx + ad\log(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] I*a*c*d*x + 1/2*I*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d + b*d*integrat
e(arctan(c*x)/x, x) + a*d*log(x)
```

mupad [B] time = 0.62, size = 63, normalized size = 0.83

$$-\frac{b\,d\,\left(\ln\left(c^2\,x^2+1\right)\,1\mathrm{i}-c\,x\,\mathrm{atan}\left(c\,x\right)\,2\mathrm{i}\right)}{2}+a\,d\,\left(\ln(x)+c\,x\,1\mathrm{i}\right)-\frac{b\,d\,\left(\mathrm{Li}_2\left(1-c\,x\,1\mathrm{i}\right)-\mathrm{Li}_2\left(1+c\,x\,1\mathrm{i}\right)\right)\,1\mathrm{i}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i))/x,x)
```

```
[Out] a*d*(log(x) + c*x*1i) - (b*d*(log(c^2*x^2 + 1)*1i - c*x*atan(c*x)*2i))/2 -
(b*d*(dilog(1 - c*x*1i) - dilog(c*x*1i + 1))*1i)/2
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$id\left(\int ac\,dx + \int \left(-\frac{ia}{x}\right)dx + \int bc\,\mathrm{atan}\left(cx\right)dx + \int \left(-\frac{ib\,\mathrm{atan}\left(cx\right)}{x}\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))/x,x)
```

```
[Out] I*d*(Integral(a*c, x) + Integral(-I*a/x, x) + Integral(b*c*atan(c*x), x) +
Integral(-I*b*atan(c*x)/x, x))
```

3.6 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=77

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{x}+iacd\log(x)-\frac{1}{2}bcd\log\left(c^2x^2+1\right)-\frac{1}{2}bcd\text{Li}_2(-icx)+\frac{1}{2}bcd\text{Li}_2(icx)+bcd\log(x)$$

```
[Out] -d*(a+b*arctan(c*x))/x+I*a*c*d*ln(x)+b*c*d*ln(x)-1/2*b*c*d*ln(c^2*x^2+1)-1/
2*b*c*d*polylog(2,-I*c*x)+1/2*b*c*d*polylog(2,I*c*x)
```

Rubi [A] time = 0.10, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4876, 4852, 266, 36, 29, 31, 4848, 2391}

$$-\frac{1}{2}bcd\text{PolyLog}(2,-icx)+\frac{1}{2}bcd\text{PolyLog}(2,icx)-\frac{d\left(a+b\tan^{-1}(cx)\right)}{x}+iacd\log(x)-\frac{1}{2}bcd\log\left(c^2x^2+1\right)+bcd\log$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -((d*(a + b*ArcTan[c*x]))/x) + I*a*c*d*Log[x] + b*c*d*Log[x] - (b*c*d*Log[1
 + c^2*x^2])/2 - (b*c*d*PolyLog[2, (-I)*c*x])/2 + (b*c*d*PolyLog[2, I*c*x])
/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx = \int \left(\frac{d\left(a+b\tan^{-1}(cx)\right)}{x^2}+\frac{icd\left(a+b\tan^{-1}(cx)\right)}{x}\right)dx$$

$$= d\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx + (icd)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{x} + iacd\log(x) - \frac{1}{2}(bcd)\int \frac{\log(1-icx)}{x}\,dx + \frac{1}{2}(bcd)\int$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{x} + iacd\log(x) - \frac{1}{2}bcd\mathrm{Li}_2(-icx) + \frac{1}{2}bcd\mathrm{Li}_2(icx) + \frac{1}{2}(bcd$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{x} + iacd\log(x) - \frac{1}{2}bcd\mathrm{Li}_2(-icx) + \frac{1}{2}bcd\mathrm{Li}_2(icx) + \frac{1}{2}(bcd$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{x} + iacd\log(x) + bcd\log(x) - \frac{1}{2}bcd\log\left(1+c^2x^2\right) - \frac{1}{2}bc$$

Mathematica [A] time = 0.05, size = 75, normalized size = 0.97

$$\frac{d\left(2iacx\log(x)-2a-bcx\log\left(c^2x^2+1\right)-bcx\mathrm{Li}_2(-icx)+bcx\mathrm{Li}_2(icx)+2bcx\log(x)-2b\tan^{-1}(cx)\right)}{2x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] (d*(-2*a - 2*b*ArcTan[c*x] + (2*I)*a*c*x*Log[x] + 2*b*c*x*Log[x] - b*c*x*Lo
g[1 + c^2*x^2] - b*c*x*PolyLog[2, (-I)*c*x] + b*c*x*PolyLog[2, I*c*x]))/(2*
x)
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{2i\,acdx+2\,ad-(bcdx-i\,bd)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*I*a*c*d*x + 2*a*d - (b*c*d*x - I*b*d)*log(-(c*x + I)/(c*x -
 I)))/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 127, normalized size = 1.65

$$icda\ln(cx) - \frac{da}{x} + icdb\arctan(cx)\ln(cx) - \frac{db\arctan(cx)}{x} - \frac{cdb\ln(cx)\ln(icx+1)}{2} + \frac{cdb\ln(cx)\ln(-icx+1)}{2} - \frac{cdl}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] I*c*d*a*ln(c*x)-d*a/x+I*c*d*b*arctan(c*x)*ln(c*x)-d*b*arctan(c*x)/x-1/2*c*d
*b*ln(c*x)*ln(1+I*c*x)+1/2*c*d*b*ln(c*x)*ln(1-I*c*x)-1/2*c*d*b*dilog(1+I*c*
x)+1/2*c*d*b*dilog(1-I*c*x)+c*d*b*ln(c*x)-1/2*b*c*d*ln(c^2*x^2+1)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$i\,bcd\int\frac{\arctan(cx)}{x}\,dx + i\,acd\log(x) - \frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right) - \log\left(x^2\right)\right) + \frac{2\arctan(cx)}{x}\right)bd - \frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] I*b*c*d*integrate(arctan(c*x)/x, x) + I*a*c*d*log(x) - 1/2*(c*(log(c^2*x^2
+ 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d - a*d/x
```

mupad [B] time = 0.86, size = 93, normalized size = 1.21

$$\begin{cases} -\frac{a\,d}{x} & \text{if } c=0 \\ \frac{b\,d\left(c^2\,\ln(x)-\frac{c^2\,\ln\left(c^2\,x^2+1\right)}{2}\right)}{c} + \frac{b\,c\,d\,(\mathrm{Li}_2(1-c\,x\,1\mathrm{i})-\mathrm{Li}_2(1+c\,x\,1\mathrm{i}))}{2} + \frac{a\,d\,(-1+c\,x\,\ln(x)\,1\mathrm{i})}{x} - \frac{b\,d\,\mathrm{atan}(c\,x)}{x} & \text{if } c\neq 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i))/x^2,x)
```

```
[Out] piecewise(c == 0, -(a*d)/x, c ~= 0, (b*d*(c^2*log(x) - (c^2*log(c^2*x^2 + 1
))/2))/c + (b*c*d*(dilog(- c*x*1i + 1) - dilog(c*x*1i + 1)))/2 + (a*d*(c*x*
log(x)*1i - 1))/x - (b*d*atan(c*x))/x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$id\left(\int\left(-\frac{ia}{x^2}\right)dx + \int\frac{ac}{x}\,dx + \int\left(-\frac{ib\,\mathrm{atan}(cx)}{x^2}\right)dx + \int\frac{bc\,\mathrm{atan}(cx)}{x}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))/x**2,x)
```

```
[Out] I*d*(Integral(-I*a/x**2, x) + Integral(a*c/x, x) + Integral(-I*b*atan(c*x)/
x**2, x) + Integral(b*c*atan(c*x)/x, x))
```

3.7 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=65

$$-\frac{d(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}+ibc^2d\log(x)-ibc^2d\log(cx+i)-\frac{bcd}{2x}$$

```
[Out] -1/2*b*c*d/x-1/2*d*(1+I*c*x)^2*(a+b*arctan(c*x))/x^2+I*b*c^2*d*ln(x)-I*b*c^
2*d*ln(I+c*x)
```

Rubi [A] time = 0.06, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {37, 4872, 12, 77}

$$-\frac{d(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}+ibc^2d\log(x)-ibc^2d\log(cx+i)-\frac{bcd}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -(b*c*d)/(2*x) - (d*(1 + I*c*x)^2*(a + b*ArcTan[c*x]))/(2*x^2) + I*b*c^2*d*
Log[x] - I*b*c^2*d*Log[I + c*x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx = -\frac{d(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2x^2} - (bc)\int \frac{d(-i+cx)}{2x^2(i+cx)}\,dx$$
$$= -\frac{d(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2x^2} - \frac{1}{2}(bcd)\int \frac{-i+cx}{x^2(i+cx)}\,dx$$
$$= -\frac{d(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2x^2} - \frac{1}{2}(bcd)\int \left(-\frac{1}{x^2}-\frac{2ic}{x}+\frac{2ic^2}{i+cx}\right)dx$$
$$= -\frac{bcd}{2x} - \frac{d(1+icx)^2\left(a+b\tan^{-1}(cx)\right)}{2x^2} + ibc^2d\log(x) - ibc^2d\log(i+cx)$$

Mathematica [C] time = 0.06, size = 88, normalized size = 1.35

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{bcd\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)}{2x}+\frac{1}{2}ibc^2d\left(2\log(x)-\log\left(c^2x^2+1\right)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -1/2*(d*(a + b*ArcTan[c*x]))/x^2 - (I*c*d*(a + b*ArcTan[c*x]))/x - (b*c*d*H
ypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/(2*x) + (I/2)*b*c^2*d*(2*Log[x]
 - Log[1 + c^2*x^2])
```

fricas [A] time = 0.44, size = 100, normalized size = 1.54

$$\frac{4i\,bc^2dx^2\log(x)-3i\,bc^2dx^2\log\left(\frac{cx+i}{c}\right)-i\,bc^2dx^2\log\left(\frac{cx-i}{c}\right)+(-4i\,a-2\,b)cdx-2\,ad+(2\,bcdx-i\,bd)\log\left(-\frac{cx\cdot}{cx\cdot}\right.}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] 1/4*(4*I*b*c^2*d*x^2*log(x) - 3*I*b*c^2*d*x^2*log((c*x + I)/c) - I*b*c^2*d*
x^2*log((c*x - I)/c) + (-4*I*a - 2*b)*c*d*x - 2*a*d + (2*b*c*d*x - I*b*d)*l
og(-(c*x + I)/(c*x - I)))/x^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 91, normalized size = 1.40

$$-\frac{icda}{x}-\frac{da}{2x^2}-\frac{icdb\arctan(cx)}{x}-\frac{db\arctan(cx)}{2x^2}+ic^2db\ln(cx)-\frac{bcd}{2x}-\frac{ic^2db\ln\left(c^2x^2+1\right)}{2}-\frac{b\,c^2d\arctan(cx)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] -I*c*d*a/x-1/2*d*a/x^2-I*c*d*b*arctan(c*x)/x-1/2*d*b*arctan(c*x)/x^2+I*c^2*
d*b*ln(c*x)-1/2*b*c*d/x-1/2*I*c^2*d*b*ln(c^2*x^2+1)-1/2*b*c^2*d*arctan(c*x)
```

maxima [A] time = 0.41, size = 75, normalized size = 1.15

$$-\frac{1}{2}i\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bcd-\frac{1}{2}\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bd-\frac{iacd}{x}-\frac{ad}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*I*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c*d - 1/2*((c*
arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d - I*a*c*d/x - 1/2*a*d/x^2
```

mupad [B] time = 0.54, size = 79, normalized size = 1.22

$$-\frac{\frac{d\,(a+b\,\mathrm{atan}(c\,x))}{2}+\frac{d\,x\,(a\,c\,2\mathrm{i}+b\,c+b\,c\,\mathrm{atan}(c\,x)\,2\mathrm{i})}{2}}{x^2}-\frac{d\,\left(b\,c^2\,\mathrm{atan}\,(c\,x)+b\,c^2\,\ln\left(c^2\,x^2+1\right)\,1\mathrm{i}-b\,c^2\,\ln(x)\,2\mathrm{i}\right)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i))/x^3,x)
```

```
[Out] - ((d*(a + b*atan(c*x)))/2 + (d*x*(a*c*2i + b*c + b*c*atan(c*x)*2i))/2)/x^2
 - (d*(b*c^2*atan(c*x) + b*c^2*log(c^2*x^2 + 1)*1i - b*c^2*log(x)*2i))/2
```

sympy [B] time = 3.47, size = 182, normalized size = 2.80

$$ibc^2d\log\left(35b^2c^5d^2x\right)-\frac{ibc^2d\log\left(35b^2c^5d^2x-35ib^2c^4d^2\right)}{4}-\frac{3ibc^2d\log\left(35b^2c^5d^2x+35ib^2c^4d^2\right)}{4}+\frac{-ad+x(-2iacd}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))/x**3,x)
```

```
[Out] I*b*c**2*d*log(35*b**2*c**5*d**2*x) - I*b*c**2*d*log(35*b**2*c**5*d**2*x -
35*I*b**2*c**4*d**2)/4 - 3*I*b*c**2*d*log(35*b**2*c**5*d**2*x + 35*I*b**2*c
**4*d**2)/4 + (-a*d + x*(-2*I*a*c*d - b*c*d))/(2*x**2) + (-2*b*c*d*x + I*b*
d)*log(I*c*x + 1)/(4*x**2) + (2*b*c*d*x - I*b*d)*log(-I*c*x + 1)/(4*x**2)
```

3.8 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=106

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{1}{3}bc^3d\log(x)-\frac{1}{12}bc^3d\log(-cx+i)+\frac{5}{12}bc^3d\log(cx+i)-\frac{ibc^2d}{2x}-\frac{bcd}{6x^2}$$

```
[Out] -1/6*b*c*d/x^2-1/2*I*b*c^2*d/x-1/3*d*(a+b*arctan(c*x))/x^3-1/2*I*c*d*(a+b*a
rctan(c*x))/x^2-1/3*b*c^3*d*ln(x)-1/12*b*c^3*d*ln(I-c*x)+5/12*b*c^3*d*ln(I+
c*x)
```

Rubi [A] time = 0.09, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 4872, 12, 801}

$$-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{ibc^2d}{2x}-\frac{1}{3}bc^3d\log(x)-\frac{1}{12}bc^3d\log(-cx+i)+\frac{5}{12}bc^3d\log(cx+i)-\frac{bcd}{6x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*d)/(6*x^2) - ((I/2)*b*c^2*d)/x - (d*(a + b*ArcTan[c*x]))/(3*x^3) - ((
I/2)*c*d*(a + b*ArcTan[c*x]))/x^2 - (b*c^3*d*Log[x])/3 - (b*c^3*d*Log[I - c
*x])/12 + (5*b*c^3*d*Log[I + c*x])/12
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx = -\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{2x^2}-(bc)\int \frac{d(-2-3icx)}{6x^3\left(1+c^2x^2\right)}\,dx$$
$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{1}{6}(bcd)\int \frac{-2-3icx}{x^3\left(1+c^2x^2\right)}\,dx$$
$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{1}{6}(bcd)\int \left(-\frac{2}{x^3}-\frac{3ic}{x^2}+\frac{2c^2}{x}\right.$$
$$= -\frac{bcd}{6x^2}-\frac{ibc^2d}{2x}-\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{1}{3}bc^3d\log(x)$$

Mathematica [C] time = 0.06, size = 94, normalized size = 0.89

$$-\frac{d\left(3iacx+2a+2bc^3x^3\log(x)+3ibc^2x^2\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)-bc^3x^3\log\left(c^2x^2+1\right)+bcx+b(2+3icx)\tan^{-1}(c\right.}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -1/6*(d*(2*a + (3*I)*a*c*x + b*c*x + b*(2 + (3*I)*c*x)*ArcTan[c*x] + (3*I)*
b*c^2*x^2*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)] + 2*b*c^3*x^3*Log[x]
- b*c^3*x^3*Log[1 + c^2*x^2]))/x^3
```

fricas [A] time = 0.44, size = 111, normalized size = 1.05

$$-\frac{4\,bc^3dx^3\log(x)-5\,bc^3dx^3\log\left(\frac{cx+i}{c}\right)+bc^3dx^3\log\left(\frac{cx-i}{c}\right)+6i\,bc^2dx^2-(-6i\,a-2\,b)cdx+4\,ad-(3\,bcdx-2i\,bd)}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/12*(4*b*c^3*d*x^3*log(x) - 5*b*c^3*d*x^3*log((c*x + I)/c) + b*c^3*d*x^3*
log((c*x - I)/c) + 6*I*b*c^2*d*x^2 - (-6*I*a - 2*b)*c*d*x + 4*a*d - (3*b*c*
d*x - 2*I*b*d)*log(-(c*x + I)/(c*x - I)))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 101, normalized size = 0.95

$$-\frac{da}{3x^3}-\frac{icda}{2x^2}-\frac{db\arctan(cx)}{3x^3}-\frac{icdb\arctan(cx)}{2x^2}-\frac{ibc^2d}{2x}-\frac{bcd}{6x^2}-\frac{c^3db\ln(cx)}{3}+\frac{c^3db\ln\left(c^2x^2+1\right)}{6}-\frac{ic^3db\arctan(cx)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] -1/3*d*a/x^3-1/2*I*c*d*a/x^2-1/3*d*b*arctan(c*x)/x^3-1/2*I*c*d*b*arctan(c*x
)/x^2-1/2*I*b*c^2*d/x-1/6*b*c*d/x^2-1/3*c^3*d*b*ln(c*x)+1/6*c^3*d*b*ln(c^2*
x^2+1)-1/2*I*c^3*d*b*arctan(c*x)
```

maxima [A] time = 0.41, size = 87, normalized size = 0.82

$$-\frac{1}{2}i\left(\left(c\arctan\left(cx\right)+\frac{1}{x}\right)c+\frac{\arctan\left(cx\right)}{x^2}\right)bcd+\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan\left(cx\right)}{x^3}\right)bd-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -1/2*I*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*c*d + 1/6*((c^2*log(c^
2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*d - 1/2*I*a*c*d
/x^2 - 1/3*a*d/x^3
```

mupad [B] time = 0.88, size = 176, normalized size = 1.66

$$\frac{b\,c^3\,d\,\ln\left(c^2\,x^2+1\right)}{6}-\frac{\frac{a\,d}{3}-x^5\,\left(\frac{b\,c^5\,d}{6}+\frac{a\,c^5\,d\,1\mathrm{i}}{2}\right)+\frac{b\,d\,\mathrm{atan}(c\,x)}{3}+\frac{c\,d\,x\,(b+a\,3\mathrm{i})}{6}+\frac{c^2\,d\,x^2\,(2\,a+b\,3\mathrm{i})}{6}+\frac{b\,c^4\,d\,x^4\,1\mathrm{i}}{2}+\frac{b\,c^2\,d\,x^2\,\mathrm{atan}(}{3}}{c^2\,x^5+x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i))/x^4,x)
```

```
[Out] (b*c^3*d*log(c^2*x^2 + 1))/6 - (b*d*atan((c^2*x)/(c^2)^(1/2))*(c^2)^(3/2)*1
i)/2 - ((a*d)/3 - x^5*((a*c^5*d*1i)/2 + (b*c^5*d)/6) + (b*d*atan(c*x))/3 +
(c*d*x*(a*3i + b))/6 + (c^2*d*x^2*(2*a + b*3i))/6 + (b*c^4*d*x^4*1i)/2 + (b
*c^2*d*x^2*atan(c*x))/3 + (b*c^3*d*x^3*atan(c*x)*1i)/2 + (b*c*d*x*atan(c*x)
*1i)/2)/(x^3 + c^2*x^5) - (b*c^3*d*log(x))/3
```

sympy [A] time = 4.63, size = 197, normalized size = 1.86

$$-\frac{bc^3d\log\left(27b^2c^7d^2x\right)}{3}-\frac{bc^3d\log\left(27b^2c^7d^2x-27ib^2c^6d^2\right)}{12}+\frac{5bc^3d\log\left(27b^2c^7d^2x+27ib^2c^6d^2\right)}{12}+\frac{(-3bcdx+2i}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))/x**4,x)
```

```
[Out] -b*c**3*d*log(27*b**2*c**7*d**2*x)/3 - b*c**3*d*log(27*b**2*c**7*d**2*x - 2
7*I*b**2*c**6*d**2)/12 + 5*b*c**3*d*log(27*b**2*c**7*d**2*x + 27*I*b**2*c**
6*d**2)/12 + (-3*b*c*d*x + 2*I*b*d)*log(I*c*x + 1)/(12*x**3) + (3*b*c*d*x -
 2*I*b*d)*log(-I*c*x + 1)/(12*x**3) + (-2*a*d - 3*I*b*c**2*d*x**2 + x*(-3*I
*a*c*d - b*c*d))/(6*x**3)
```

3.9 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=124

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{1}{3}ibc^4d\log(x)+\frac{1}{24}ibc^4d\log(-cx+i)+\frac{7}{24}ibc^4d\log(cx+i)+\frac{bc^3d}{4x}-\frac{ibc^2d}{6x^2}$$

```
[Out] -1/12*b*c*d/x^3-1/6*I*b*c^2*d/x^2+1/4*b*c^3*d/x-1/4*d*(a+b*arctan(c*x))/x^4
-1/3*I*c*d*(a+b*arctan(c*x))/x^3-1/3*I*b*c^4*d*ln(x)+1/24*I*b*c^4*d*ln(I-c*
x)+7/24*I*b*c^4*d*ln(I+c*x)
```

Rubi [A] time = 0.10, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 4872, 12, 801}

$$-\frac{icd\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{ibc^2d}{6x^2}+\frac{bc^3d}{4x}-\frac{1}{3}ibc^4d\log(x)+\frac{1}{24}ibc^4d\log(-cx+i)+\frac{7}{24}ibc^4d\log(cx+i)$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(b*c*d)/(12*x^3) - ((I/6)*b*c^2*d)/x^2 + (b*c^3*d)/(4*x) - (d*(a + b*ArcTa
n[c*x]))/(4*x^4) - ((I/3)*c*d*(a + b*ArcTan[c*x]))/x^3 - (I/3)*b*c^4*d*Log[
x] + (I/24)*b*c^4*d*Log[I - c*x] + ((7*I)/24)*b*c^4*d*Log[I + c*x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}{x^5}dx = -\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{icd\left(a+b\tan^{-1}(cx)\right)}{3x^3} - (bc)\int \frac{d(-3-4icx)}{12x^4\left(1+c^2x^2\right)}dx$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{icd\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{1}{12}(bcd)\int \frac{-3-4icx}{x^4\left(1+c^2x^2\right)} d$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{icd\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{1}{12}(bcd)\int \left(-\frac{3}{x^4} - \frac{4ic}{x^3} + \right.$$

$$= -\frac{bcd}{12x^3} - \frac{ibc^2d}{6x^2} + \frac{bc^3d}{4x} - \frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{icd\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{1}{3}i$$

Mathematica [C] time = 0.06, size = 99, normalized size = 0.80

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{icd\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{bcd\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right)}{12x^3} - \frac{1}{6}ibc^2d\left(-c^2\log\left(c^2x^2+1\right)+2c^2\log(\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -1/4*(d*(a + b*ArcTan[c*x]))/x^4 - ((I/3)*c*d*(a + b*ArcTan[c*x]))/x^3 - (b
*c*d*Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)])/(12*x^3) - (I/6)*b*c^2*d
*(x^(-2) + 2*c^2*Log[x] - c^2*Log[1 + c^2*x^2])
```

fricas [A] time = 0.44, size = 120, normalized size = 0.97

$$\frac{-8i\,bc^4dx^4\log(x) + 7i\,bc^4dx^4\log\left(\frac{cx+i}{c}\right) + i\,bc^4dx^4\log\left(\frac{cx-i}{c}\right) + 6\,bc^3dx^3 - 4i\,bc^2dx^2 + (-8i\,a-2\,b)cdx - 6\,ad +}{24\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] 1/24*(-8*I*b*c^4*d*x^4*log(x) + 7*I*b*c^4*d*x^4*log((c*x + I)/c) + I*b*c^4*
d*x^4*log((c*x - I)/c) + 6*b*c^3*d*x^3 - 4*I*b*c^2*d*x^2 + (-8*I*a - 2*b)*c
*d*x - 6*a*d + (4*b*c*d*x - 3*I*b*d)*log(-(c*x + I)/(c*x - I)))/x^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 112, normalized size = 0.90

$$-\frac{icda}{3x^3} - \frac{da}{4x^4} - \frac{icdb\arctan(cx)}{3x^3} - \frac{db\arctan(cx)}{4x^4} - \frac{ibc^2d}{6x^2} - \frac{ic^4db\ln(cx)}{3} - \frac{bcd}{12x^3} + \frac{bc^3d}{4x} + \frac{ic^4db\ln\left(c^2x^2+1\right)}{6} + \frac{c^4db\,\mathrm{ar}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] -1/3*I*c*d*a/x^3-1/4*d*a/x^4-1/3*I*c*d*b*arctan(c*x)/x^3-1/4*d*b*arctan(c*x
)/x^4-1/6*I*b*c^2*d/x^2-1/3*I*c^4*d*b*ln(c*x)-1/12*b*c*d/x^3+1/4*b*c^3*d/x+
1/6*I*c^4*d*b*ln(c^2*x^2+1)+1/4*c^4*d*b*arctan(c*x)
```

maxima [A] time = 0.41, size = 102, normalized size = 0.82

$$\frac{1}{6}i\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan\left(cx\right)}{x^3}\right)bcd+\frac{1}{12}\left(\left(3c^3\arctan\left(cx\right)+\frac{3c^2x^2-1}{x^3}\right)c-\frac{3\arctan}{x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] 1/6*I*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)
*b*c*d + 1/12*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/
x^4)*b*d - 1/3*I*a*c*d/x^3 - 1/4*a*d/x^4
```

mupad [B] time = 0.58, size = 116, normalized size = 0.94

$$\frac{d\left(\frac{3\,b\,c^7\,\mathrm{atan}\left(\frac{c^2\,x}{\sqrt{c^2}}\right)}{\left(c^2\right)^{3/2}}+b\,c^4\,\ln\left(c^2\,x^2+1\right)\,2\mathrm{i}-b\,c^4\,\ln(x)\,4\mathrm{i}\right)}{12}-\frac{\frac{d\,(3\,a+3\,b\,\mathrm{atan}(c\,x))}{12}+\frac{d\,x\,(a\,c\,4\mathrm{i}+b\,c+b\,c\,\mathrm{atan}(c\,x)\,4\mathrm{i})}{12}-\frac{b\,c^3\,d\,x^3}{4}+\frac{b\,c^2}{}}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i))/x^5,x)
```

```
[Out] (d*(b*c^4*log(c^2*x^2 + 1)*2i - b*c^4*log(x)*4i + (3*b*c^7*atan((c^2*x)/(c^
2)^(1/2)))/(c^2)^(3/2)))/12 - ((d*(3*a + 3*b*atan(c*x)))/12 + (d*x*(a*c*4i
+ b*c + b*c*atan(c*x)*4i))/12 + (b*c^2*d*x^2*1i)/6 - (b*c^3*d*x^3)/4)/x^4
```

sympy [A] time = 7.15, size = 214, normalized size = 1.73

$$-\frac{ibc^4d\log\left(135b^2c^9d^2x\right)}{3}+\frac{ibc^4d\log\left(135b^2c^9d^2x-135ib^2c^8d^2\right)}{24}+\frac{7ibc^4d\log\left(135b^2c^9d^2x+135ib^2c^8d^2\right)}{24}+\frac{(-4bcdx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))/x**5,x)
```

```
[Out] -I*b*c**4*d*log(135*b**2*c**9*d**2*x)/3 + I*b*c**4*d*log(135*b**2*c**9*d**2
*x - 135*I*b**2*c**8*d**2)/24 + 7*I*b*c**4*d*log(135*b**2*c**9*d**2*x + 135
*I*b**2*c**8*d**2)/24 + (-4*b*c*d*x + 3*I*b*d)*log(I*c*x + 1)/(24*x**4) + (
4*b*c*d*x - 3*I*b*d)*log(-I*c*x + 1)/(24*x**4) + (-3*a*d + 3*b*c**3*d*x**3
- 2*I*b*c**2*d*x**2 + x*(-4*I*a*c*d - b*c*d))/(12*x**4)
```

3.10 $\int x^3(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=166

$$-\frac{1}{6}c^2d^2x^6\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}icd^2x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)-\frac{5bd^2\tan^{-1}(cx)}{12c^4}+\frac{5bd^2x}{12c^3}+\frac{ibd^2}{5c}$$

```
[Out] 5/12*b*d^2*x/c^3+1/5*I*b*d^2*x^2/c^2-5/36*b*d^2*x^3/c-1/10*I*b*d^2*x^4+1/30
*b*c*d^2*x^5-5/12*b*d^2*arctan(c*x)/c^4+1/4*d^2*x^4*(a+b*arctan(c*x))+2/5*I
*c*d^2*x^5*(a+b*arctan(c*x))-1/6*c^2*d^2*x^6*(a+b*arctan(c*x))-1/5*I*b*d^2*
ln(c^2*x^2+1)/c^4
```

Rubi [A] time = 0.16, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {43, 4872, 12, 1802, 635, 203, 260}

$$-\frac{1}{6}c^2d^2x^6\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}icd^2x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{ibd^2x^2}{5c^2}-\frac{ibd^2\log\left(c^2x^2+1\right)}{5c^4}+$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (5*b*d^2*x)/(12*c^3) + ((I/5)*b*d^2*x^2)/c^2 - (5*b*d^2*x^3)/(36*c) - (I/10
)*b*d^2*x^4 + (b*c*d^2*x^5)/30 - (5*b*d^2*ArcTan[c*x])/(12*c^4) + (d^2*x^4*
(a + b*ArcTan[c*x]))/4 + ((2*I)/5)*c*d^2*x^5*(a + b*ArcTan[c*x]) - (c^2*d^2
*x^6*(a + b*ArcTan[c*x]))/6 - ((I/5)*b*d^2*Log[1 + c^2*x^2])/c^4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
```

```
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^3(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)dx=\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}icd^2x^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{6}c^2d^2x^6\left(a+b\tan\right.$$

$$=\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}icd^2x^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{6}c^2d^2x^6\left(a+b\tan\right.$$

$$=\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}icd^2x^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{6}c^2d^2x^6\left(a+b\tan\right.$$

$$=\frac{5bd^2x}{12c^3}+\frac{ibd^2x^2}{5c^2}-\frac{5bd^2x^3}{36c}-\frac{1}{10}ibd^2x^4+\frac{1}{30}bcd^2x^5+\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(\right.$$

$$=\frac{5bd^2x}{12c^3}+\frac{ibd^2x^2}{5c^2}-\frac{5bd^2x^3}{36c}-\frac{1}{10}ibd^2x^4+\frac{1}{30}bcd^2x^5+\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(\right.$$

$$=\frac{5bd^2x}{12c^3}+\frac{ibd^2x^2}{5c^2}-\frac{5bd^2x^3}{36c}-\frac{1}{10}ibd^2x^4+\frac{1}{30}bcd^2x^5-\frac{5bd^2\tan^{-1}(cx)}{12c^4}+\frac{1}{4}$$

Mathematica [A] time = 0.13, size = 124, normalized size = 0.75

$$\frac{d^2\left(3ac^4x^4\left(-10c^2x^2+24icx+15\right)-36ib\log\left(c^2x^2+1\right)+3b\left(-10c^6x^6+24ic^5x^5+15c^4x^4-25\right)\tan^{-1}(cx)+bcx\right.}{180c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d^2*(3*a*c^4*x^4*(15 + (24*I)*c*x - 10*c^2*x^2) + b*c*x*(75 + (36*I)*c*x -
 25*c^2*x^2 - (18*I)*c^3*x^3 + 6*c^4*x^4) + 3*b*(-25 + 15*c^4*x^4 + (24*I)*
c^5*x^5 - 10*c^6*x^6)*ArcTan[c*x] - (36*I)*b*Log[1 + c^2*x^2]))/(180*c^4)
```

fricas [A] time = 0.46, size = 172, normalized size = 1.04

$$-\frac{60\,ac^6d^2x^6-(144i\,a+12\,b)c^5d^2x^5-18\,(5\,a-2i\,b)c^4d^2x^4+50\,bc^3d^2x^3-72i\,bc^2d^2x^2-150\,bcd^2x+147i\,bd^2\log}{360\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] -1/360*(60*a*c^6*d^2*x^6 - (144*I*a + 12*b)*c^5*d^2*x^5 - 18*(5*a - 2*I*b)*
c^4*d^2*x^4 + 50*b*c^3*d^2*x^3 - 72*I*b*c^2*d^2*x^2 - 150*b*c*d^2*x + 147*I
*b*d^2*log((c*x + I)/c) - 3*I*b*d^2*log((c*x - I)/c) - (-30*I*b*c^6*d^2*x^6
 - 72*b*c^5*d^2*x^5 + 45*I*b*c^4*d^2*x^4)*log(-(c*x + I)/(c*x - I)))/c^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 166, normalized size = 1.00

$$-\frac{c^2d^2a\,x^6}{6}+\frac{2ic\,d^2a\,x^5}{5}+\frac{d^2a\,x^4}{4}-\frac{c^2d^2b\arctan(cx)\,x^6}{6}+\frac{2ic\,d^2b\arctan(cx)\,x^5}{5}+\frac{d^2b\arctan(cx)\,x^4}{4}+\frac{5b\,d^2x}{12c^3}+\frac{bc\,d^2}{30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x)
```

```
[Out] -1/6*c^2*d^2*a*x^6+2/5*I*c*d^2*a*x^5+1/4*d^2*a*x^4-1/6*c^2*d^2*b*arctan(c*x
)*x^6+2/5*I*c*d^2*b*arctan(c*x)*x^5+1/4*d^2*b*arctan(c*x)*x^4+5/12*b*d^2*x/
c^3+1/30*b*c*d^2*x^5-1/10*I*b*d^2*x^4-5/36*b*d^2*x^3/c+1/5*I*b*d^2*x^2/c^2-
1/5*I*b*d^2*ln(c^2*x^2+1)/c^4-5/12*b*d^2*arctan(c*x)/c^4
```

maxima [A] time = 0.42, size = 185, normalized size = 1.11

$$-\frac{1}{6}\,ac^2d^2x^6+\frac{2}{5}i\,acd^2x^5+\frac{1}{4}\,ad^2x^4-\frac{1}{90}\left(15\,x^6\arctan(cx)-c\left(\frac{3\,c^4x^5-5\,c^2x^3+15\,x}{c^6}-\frac{15\,\arctan(cx)}{c^7}\right)\right)bc^2d^2+\frac{1}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/6*a*c^2*d^2*x^6 + 2/5*I*a*c*d^2*x^5 + 1/4*a*d^2*x^4 - 1/90*(15*x^6*arcta
n(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*c^2
*d^2 + 1/10*I*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2
 + 1)/c^6))*b*c*d^2 + 1/12*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*
arctan(c*x)/c^5))*b*d^2
```

mupad [B] time = 0.76, size = 152, normalized size = 0.92

$$-\frac{\frac{d^2\left(75\,b\,\mathrm{atan}(c\,x)+b\,\ln\left(c^2\,x^2+1\right)\,36{}\mathrm{i}\right)}{180}+\frac{5\,b\,c^3\,d^2\,x^3}{36}-\frac{5\,b\,c\,d^2\,x}{12}-\frac{b\,c^2\,d^2\,x^2\,1{}\mathrm{i}}{5}}{c^4}+\frac{d^2\,\left(45\,a\,x^4+45\,b\,x^4\,\mathrm{atan}\left(c\,x\right)-b\,x^4\,18{}\mathrm{i}\right)}{180}-\frac{c^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + c*d*x*1i)^2,x)
```

```
[Out] (d^2*(45*a*x^4 - b*x^4*18i + 45*b*x^4*atan(c*x)))/180 - ((d^2*(75*b*atan(c*
x) + b*log(c^2*x^2 + 1)*36i))/180 - (b*c^2*d^2*x^2*1i)/5 + (5*b*c^3*d^2*x^3
)/36 - (5*b*c*d^2*x)/12)/c^4 - (c^2*d^2*(30*a*x^6 + 30*b*x^6*atan(c*x)))/18
0 + (c*d^2*(a*x^5*72i + 6*b*x^5 + b*x^5*atan(c*x)*72i))/180
```

sympy [A] time = 4.53, size = 270, normalized size = 1.63

$$-\frac{ac^2d^2x^6}{6}-\frac{5bd^2x^3}{36c}+\frac{ibd^2x^2}{5c^2}+\frac{5bd^2x}{12c^3}-\frac{bd^2\left(-\frac{i\log\left(291bcd^2x-291ibd^2\right)}{120}+\frac{71i\log\left(291bcd^2x+291ibd^2\right)}{210}\right)}{c^4}-x^5\left(-\frac{2iacd^2}{5}-\frac{bcd^2}{30}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+I*c*d*x)**2*(a+b*atan(c*x)),x)
```

```
[Out] -a*c**2*d**2*x**6/6 - 5*b*d**2*x**3/(36*c) + I*b*d**2*x**2/(5*c**2) + 5*b*d
**2*x/(12*c**3) - b*d**2*(-I*log(291*b*c*d**2*x - 291*I*b*d**2)/120 + 71*I*
log(291*b*c*d**2*x + 291*I*b*d**2)/210)/c**4 - x**5*(-2*I*a*c*d**2/5 - b*c*
```

```
d**2/30) - x**4*(-a*d**2/4 + I*b*d**2/10) + (I*b*c**2*d**2*x**6/12 + b*c*d*
*2*x**5/5 - I*b*d**2*x**4/8)*log(I*c*x + 1) - (70*I*b*c**6*d**2*x**6 + 168*
b*c**5*d**2*x**5 - 105*I*b*c**4*d**2*x**4 + 59*I*b*d**2)*log(-I*c*x + 1)/(8
40*c**4)
```

3.11 $\int x^2(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=152

$$-\frac{1}{5}c^2d^2x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}icd^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)-\frac{ibd^2\tan^{-1}(cx)}{2c^3}+\frac{ibd^2x}{2c^2}+\frac{4bd^2}{}$$

```
[Out] 1/2*I*b*d^2*x/c^2-4/15*b*d^2*x^2/c-1/6*I*b*d^2*x^3+1/20*b*c*d^2*x^4-1/2*I*b
*d^2*arctan(c*x)/c^3+1/3*d^2*x^3*(a+b*arctan(c*x))+1/2*I*c*d^2*x^4*(a+b*arc
tan(c*x))-1/5*c^2*d^2*x^5*(a+b*arctan(c*x))+4/15*b*d^2*ln(c^2*x^2+1)/c^3
```

Rubi [A] time = 0.15, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}=0.304$, Rules used = {43, 4872, 12, 1802, 635, 203, 260}

$$-\frac{1}{5}c^2d^2x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}icd^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{4bd^2\log\left(c^2x^2+1\right)}{15c^3}+\frac{ibd^2x}{2c^2}-$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] ((I/2)*b*d^2*x)/c^2 - (4*b*d^2*x^2)/(15*c) - (I/6)*b*d^2*x^3 + (b*c*d^2*x^4
)/20 - ((I/2)*b*d^2*ArcTan[c*x])/c^3 + (d^2*x^3*(a + b*ArcTan[c*x]))/3 + (I
/2)*c*d^2*x^4*(a + b*ArcTan[c*x]) - (c^2*d^2*x^5*(a + b*ArcTan[c*x]))/5 + (
4*b*d^2*Log[1 + c^2*x^2])/(15*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
```

```
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^2(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)dx = \frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}icd^2x^4\left(a+b\tan^{-1}(cx)\right)-\frac{1}{5}c^2d^2x^5\left(a+b\tan\right.$$

$$= \frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}icd^2x^4\left(a+b\tan^{-1}(cx)\right)-\frac{1}{5}c^2d^2x^5\left(a+b\tan\right.$$

$$= \frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}icd^2x^4\left(a+b\tan^{-1}(cx)\right)-\frac{1}{5}c^2d^2x^5\left(a+b\tan\right.$$

$$= \frac{ibd^2x}{2c^2}-\frac{4bd^2x^2}{15c}-\frac{1}{6}ibd^2x^3+\frac{1}{20}bcd^2x^4+\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}icd$$

$$= \frac{ibd^2x}{2c^2}-\frac{4bd^2x^2}{15c}-\frac{1}{6}ibd^2x^3+\frac{1}{20}bcd^2x^4+\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}icd$$

$$= \frac{ibd^2x}{2c^2}-\frac{4bd^2x^2}{15c}-\frac{1}{6}ibd^2x^3+\frac{1}{20}bcd^2x^4-\frac{ibd^2\tan^{-1}(cx)}{2c^3}+\frac{1}{3}d^2x^3\left(a+b\,\mathrm{t}\right.$$

Mathematica [A] time = 0.12, size = 116, normalized size = 0.76

$$\frac{d^2\left(2ac^3x^3\left(-6c^2x^2+15icx+10\right)+16b\log\left(c^2x^2+1\right)+bcx\left(3c^3x^3-10ic^2x^2-16cx+30i\right)+2b\left(-6c^5x^5+15ic^4\right.\right.}{60c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d^2*(2*a*c^3*x^3*(10 + (15*I)*c*x - 6*c^2*x^2) + b*c*x*(30*I - 16*c*x - (1
0*I)*c^2*x^2 + 3*c^3*x^3) + 2*b*(-15*I + 10*c^3*x^3 + (15*I)*c^4*x^4 - 6*c^
5*x^5)*ArcTan[c*x] + 16*b*Log[1 + c^2*x^2]))/(60*c^3)
```

fricas [A] time = 0.44, size = 160, normalized size = 1.05

$$-\frac{12\,ac^5d^2x^5-(30i\,a+3\,b)c^4d^2x^4-10\,(2\,a-i\,b)c^3d^2x^3+16\,bc^2d^2x^2-30i\,bcd^2x-31\,bd^2\log\left(\frac{cx+i}{c}\right)-bd^2\log\left(\frac{cx-}{c}\right.}{60\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] -1/60*(12*a*c^5*d^2*x^5 - (30*I*a + 3*b)*c^4*d^2*x^4 - 10*(2*a - I*b)*c^3*d
^2*x^3 + 16*b*c^2*d^2*x^2 - 30*I*b*c*d^2*x - 31*b*d^2*log((c*x + I)/c) - b*
d^2*log((c*x - I)/c) - (-6*I*b*c^5*d^2*x^5 - 15*b*c^4*d^2*x^4 + 10*I*b*c^3*
d^2*x^3)*log(-(c*x + I)/(c*x - I)))/c^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 154, normalized size = 1.01

$$-\frac{c^2d^2a\,x^5}{5}+\frac{ic\,d^2a\,x^4}{2}+\frac{d^2a\,x^3}{3}-\frac{c^2d^2b\arctan(cx)\,x^5}{5}+\frac{ic\,d^2b\arctan(cx)\,x^4}{2}+\frac{d^2b\arctan(cx)\,x^3}{3}+\frac{ib\,d^2x}{2c^2}+\frac{bc\,d^2x^4}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x)
```

```
[Out] -1/5*c^2*d^2*a*x^5+1/2*I*c*d^2*a*x^4+1/3*d^2*a*x^3-1/5*c^2*d^2*b*arctan(c*x
)*x^5+1/2*I*c*d^2*b*arctan(c*x)*x^4+1/3*d^2*b*arctan(c*x)*x^3+1/2*I*b*d^2*x
/c^2+1/20*b*c*d^2*x^4-1/6*I*b*d^2*x^3-4/15*b*d^2*x^2/c+4/15*b*d^2*ln(c^2*x^
2+1)/c^3-1/2*I*b*d^2*arctan(c*x)/c^3
```

maxima [A] time = 0.41, size = 174, normalized size = 1.14

$$-\frac{1}{5}\,ac^2d^2x^5+\frac{1}{2}i\,acd^2x^4-\frac{1}{20}\left(4\,x^5\arctan(cx)-c\left(\frac{c^2x^4-2\,x^2}{c^4}+\frac{2\,\log\left(c^2x^2+1\right)}{c^6}\right)\right)bc^2d^2+\frac{1}{3}\,ad^2x^3+\frac{1}{6}i\left(3\,x^4\,\mathrm{arc}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/5*a*c^2*d^2*x^5 + 1/2*I*a*c*d^2*x^4 - 1/20*(4*x^5*arctan(c*x) - c*((c^2*
x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*c^2*d^2 + 1/3*a*d^2*x^3 + 1/6
*I*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*c*d^
2 + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*d^2
```

mupad [B] time = 0.74, size = 140, normalized size = 0.92

$$-\frac{\frac{d^2\left(-16\,b\,\ln\left(c^2\,x^2+1\right)+b\,\mathrm{atan}(c\,x)\,30\mathrm{i}\right)}{60}+\frac{4\,b\,c^2\,d^2\,x^2}{15}-\frac{b\,c\,d^2\,x\,1\mathrm{i}}{2}}{c^3}+\frac{d^2\,\left(20\,a\,x^3+20\,b\,x^3\,\mathrm{atan}\,(c\,x)-b\,x^3\,10\mathrm{i}\right)}{60}-\frac{c^2\,d^2\,\left(12\,a\,x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + c*d*x*1i)^2,x)
```

```
[Out] (d^2*(20*a*x^3 - b*x^3*10i + 20*b*x^3*atan(c*x)))/60 - ((d^2*(b*atan(c*x)*3
0i - 16*b*log(c^2*x^2 + 1)))/60 + (4*b*c^2*d^2*x^2)/15 - (b*c*d^2*x*1i)/2)/
c^3 - (c^2*d^2*(12*a*x^5 + 12*b*x^5*atan(c*x)))/60 + (c*d^2*(a*x^4*30i + 3*
b*x^4 + b*x^4*atan(c*x)*30i))/60
```

sympy [A] time = 4.13, size = 250, normalized size = 1.64

$$-\frac{ac^2d^2x^5}{5}-\frac{4bd^2x^2}{15c}+\frac{ibd^2x}{2c^2}-\frac{bd^2\left(-\frac{\log\left(47bcd^2x-47ibd^2\right)}{60}-\frac{49\log\left(47bcd^2x+47ibd^2\right)}{120}\right)}{c^3}-x^4\left(-\frac{iacd^2}{2}-\frac{bcd^2}{20}\right)-x^3\left(-\frac{ad^2}{3}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+I*c*d*x)**2*(a+b*atan(c*x)),x)
```

```
[Out] -a*c**2*d**2*x**5/5 - 4*b*d**2*x**2/(15*c) + I*b*d**2*x/(2*c**2) - b*d**2*(
-log(47*b*c*d**2*x - 47*I*b*d**2)/60 - 49*log(47*b*c*d**2*x + 47*I*b*d**2)/
120)/c**3 - x**4*(-I*a*c*d**2/2 - b*c*d**2/20) - x**3*(-a*d**2/3 + I*b*d**2
/6) + (I*b*c**2*d**2*x**5/10 + b*c*d**2*x**4/4 - I*b*d**2*x**3/6)*log(I*c*x
 + 1) - (12*I*b*c**5*d**2*x**5 + 30*b*c**4*d**2*x**4 - 20*I*b*c**3*d**2*x**
3 - 13*b*d**2)*log(-I*c*x + 1)/(120*c**3)
```

3.12 $\int x(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=136

$$-\frac{1}{4}c^2d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}icd^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{ibd^2\log\left(c^2x^2+1\right)}{3c^2}+\frac{3bd^2\tan^{-1}}{4c^2}$$

```
[Out] -3/4*b*d^2*x/c-1/3*I*b*d^2*x^2+1/12*b*c*d^2*x^3+3/4*b*d^2*arctan(c*x)/c^2+1
/2*d^2*x^2*(a+b*arctan(c*x))+2/3*I*c*d^2*x^3*(a+b*arctan(c*x))-1/4*c^2*d^2*
x^4*(a+b*arctan(c*x))+1/3*I*b*d^2*ln(c^2*x^2+1)/c^2
```

Rubi [A] time = 0.13, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {43, 4872, 12, 1802, 635, 203, 260}

$$-\frac{1}{4}c^2d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}icd^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{ibd^2\log\left(c^2x^2+1\right)}{3c^2}+\frac{3bd^2\tan^{-1}}{4c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (-3*b*d^2*x)/(4*c) - (I/3)*b*d^2*x^2 + (b*c*d^2*x^3)/12 + (3*b*d^2*ArcTan[c
*x])/(4*c^2) + (d^2*x^2*(a + b*ArcTan[c*x]))/2 + ((2*I)/3)*c*d^2*x^3*(a + b
*ArcTan[c*x]) - (c^2*d^2*x^4*(a + b*ArcTan[c*x]))/4 + ((I/3)*b*d^2*Log[1 +
c^2*x^2])/c^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
```

```
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)dx = \frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}icd^2x^3\left(a+b\tan^{-1}(cx)\right)-\frac{1}{4}c^2d^2x^4\left(a+b\,\mathrm{t}\right.$$

$$=\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}icd^2x^3\left(a+b\tan^{-1}(cx)\right)-\frac{1}{4}c^2d^2x^4\left(a+b\,\mathrm{t}\right.$$

$$=\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}icd^2x^3\left(a+b\tan^{-1}(cx)\right)-\frac{1}{4}c^2d^2x^4\left(a+b\,\mathrm{t}\right.$$

$$=-\frac{3bd^2x}{4c}-\frac{1}{3}ibd^2x^2+\frac{1}{12}bcd^2x^3+\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}icd^2x^3\left(a\right.$$

$$=-\frac{3bd^2x}{4c}-\frac{1}{3}ibd^2x^2+\frac{1}{12}bcd^2x^3+\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}icd^2x^3\left(a\right.$$

$$=-\frac{3bd^2x}{4c}-\frac{1}{3}ibd^2x^2+\frac{1}{12}bcd^2x^3+\frac{3bd^2\tan^{-1}(cx)}{4c^2}+\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(\right.$$

Mathematica [A] time = 0.10, size = 101, normalized size = 0.74

$$\frac{d^2\left(cx\left(acx\left(-3c^2x^2+8icx+6\right)+b\left(c^2x^2-4icx-9\right)\right)+4ib\log\left(c^2x^2+1\right)+b\left(-3c^4x^4+8ic^3x^3+6c^2x^2+9\right)\mathrm{t}\right.}{12c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d^2*(c*x*(a*c*x*(6 + (8*I)*c*x - 3*c^2*x^2) + b*(-9 - (4*I)*c*x + c^2*x^2)
) + b*(9 + 6*c^2*x^2 + (8*I)*c^3*x^3 - 3*c^4*x^4)*ArcTan[c*x] + (4*I)*b*Log
[1 + c^2*x^2]))/(12*c^2)
```

fricas [A] time = 0.46, size = 148, normalized size = 1.09

$$-\frac{6\,ac^4d^2x^4-(16i\,a+2\,b)c^3d^2x^3-4\,(3\,a-2i\,b)c^2d^2x^2+18\,bcd^2x-17i\,bd^2\log\left(\frac{cx+i}{c}\right)+i\,bd^2\log\left(\frac{cx-i}{c}\right)-\left(-3i\right.}{24\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] -1/24*(6*a*c^4*d^2*x^4 - (16*I*a + 2*b)*c^3*d^2*x^3 - 4*(3*a - 2*I*b)*c^2*d
^2*x^2 + 18*b*c*d^2*x - 17*I*b*d^2*log((c*x + I)/c) + I*b*d^2*log((c*x - I)
/c) - (-3*I*b*c^4*d^2*x^4 - 8*b*c^3*d^2*x^3 + 6*I*b*c^2*d^2*x^2)*log(-(c*x
+ I)/(c*x - I)))/c^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 141, normalized size = 1.04

$$-\frac{c^2d^2a\,x^4}{4}+\frac{2ic\,d^2a\,x^3}{3}+\frac{d^2a\,x^2}{2}-\frac{c^2d^2b\arctan\left(cx\right)x^4}{4}+\frac{2ic\,d^2b\arctan\left(cx\right)x^3}{3}+\frac{d^2b\arctan\left(cx\right)x^2}{2}-\frac{3b\,d^2x}{4c}+\frac{bc\,d^2x^3}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x)
```

```
[Out] -1/4*c^2*d^2*a*x^4+2/3*I*c*d^2*a*x^3+1/2*d^2*a*x^2-1/4*c^2*d^2*b*arctan(c*x
)*x^4+2/3*I*c*d^2*b*arctan(c*x)*x^3+1/2*d^2*b*arctan(c*x)*x^2-3/4*b*d^2*x/c
+1/12*b*c*d^2*x^3-1/3*I*b*d^2*x^2+1/3*I*b*d^2*ln(c^2*x^2+1)/c^2+3/4*b*d^2*a
rctan(c*x)/c^2
```

maxima [A] time = 0.41, size = 155, normalized size = 1.14

$$-\frac{1}{4}\,ac^2d^2x^4+\frac{2}{3}\,i\,acd^2x^3-\frac{1}{12}\left(3\,x^4\arctan\left(cx\right)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3\arctan\left(cx\right)}{c^5}\right)\right)bc^2d^2+\frac{1}{3}\,i\left(2\,x^3\arctan\left(cx\right)-c\left(\frac{x^2}{c^2}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/4*a*c^2*d^2*x^4 + 2/3*I*a*c*d^2*x^3 - 1/12*(3*x^4*arctan(c*x) - c*((c^2*
x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*c^2*d^2 + 1/3*I*(2*x^3*arctan(c*x) -
 c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*c*d^2 + 1/2*a*d^2*x^2 + 1/2*(x^2*arc
tan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*d^2
```

mupad [B] time = 0.68, size = 125, normalized size = 0.92

$$\frac{\frac{d^2\,\left(9\,b\,\mathrm{atan}\left(c\,x\right)+b\,\ln\left(c^2\,x^2+1\right)\,4\mathrm{i}\right)}{12}-\frac{3\,b\,c\,d^2\,x}{4}}{c^2}+\frac{d^2\,\left(6\,a\,x^2+6\,b\,x^2\,\mathrm{atan}\left(c\,x\right)-b\,x^2\,4\mathrm{i}\right)}{12}-\frac{c^2\,d^2\,\left(3\,a\,x^4+3\,b\,x^4\,\mathrm{atan}\left(c\,x\right)\right)}{12}+\frac{c\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + c*d*x*1i)^2,x)
```

```
[Out] ((d^2*(9*b*atan(c*x) + b*log(c^2*x^2 + 1)*4i))/12 - (3*b*c*d^2*x)/4)/c^2 +
(d^2*(6*a*x^2 - b*x^2*4i + 6*b*x^2*atan(c*x)))/12 - (c^2*d^2*(3*a*x^4 + 3*b
*x^4*atan(c*x)))/12 + (c*d^2*(a*x^3*8i + b*x^3 + b*x^3*atan(c*x)*8i))/12
```

sympy [A] time = 3.84, size = 240, normalized size = 1.76

$$-\frac{ac^2d^2x^4}{4}-\frac{3bd^2x}{4c}-\frac{bd^2\left(\frac{i\log\left(67bcd^2x-67ibd^2\right)}{24}-\frac{31i\log\left(67bcd^2x+67ibd^2\right)}{60}\right)}{c^2}-x^3\left(-\frac{2iacd^2}{3}-\frac{bcd^2}{12}\right)-x^2\left(-\frac{ad^2}{2}+\frac{ibd^2}{3}\right)+\left(\frac{ibc\ldots}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)**2*(a+b*atan(c*x)),x)
```

```
[Out] -a*c**2*d**2*x**4/4 - 3*b*d**2*x/(4*c) - b*d**2*(I*log(67*b*c*d**2*x - 67*I
*b*d**2)/24 - 31*I*log(67*b*c*d**2*x + 67*I*b*d**2)/60)/c**2 - x**3*(-2*I*a
*c*d**2/3 - b*c*d**2/12) - x**2*(-a*d**2/2 + I*b*d**2/3) + (I*b*c**2*d**2*x
**4/8 + b*c*d**2*x**3/3 - I*b*d**2*x**2/4)*log(I*c*x + 1) - (15*I*b*c**4*d*
*2*x**4 + 40*b*c**3*d**2*x**3 - 30*I*b*c**2*d**2*x**2 - 23*I*b*d**2)*log(-I
*c*x + 1)/(120*c**2)
```

3.13 $\int (d+icdx)^2 \left(a+b\tan^{-1}(cx)\right) \, dx$

Optimal. Leaf size=83

$$-\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{bd^2(1+icx)^2}{6c}-\frac{4bd^2\log(1-icx)}{3c}-\frac{2}{3}ibd^2x$$

```
[Out] -2/3*I*b*d^2*x-1/6*b*d^2*(1+I*c*x)^2/c-1/3*I*d^2*(1+I*c*x)^3*(a+b*arctan(c*
x))/c-4/3*b*d^2*ln(1-I*c*x)/c
```

Rubi [A] time = 0.05, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4862, 627, 43}

$$-\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{bd^2(1+icx)^2}{6c}-\frac{4bd^2\log(1-icx)}{3c}-\frac{2}{3}ibd^2x$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] ((-2*I)/3)*b*d^2*x - (b*d^2*(1 + I*c*x)^2)/(6*c) - ((I/3)*d^2*(1 + I*c*x)^3
*(a + b*ArcTan[c*x]))/c - (4*b*d^2*Log[1 - I*c*x])/(3*c)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$
\begin{aligned}
\int (d+icdx)^2\left(a+b\tan^{-1}(cx)\right)\,dx &= -\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{(ib)\int \frac{(d+icdx)^3}{1+c^2x^2}\,dx}{3d}\\
&= -\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{(ib)\int \frac{(d+icdx)^2}{\frac{1}{d}-\frac{icx}{d}}\,dx}{3d}\\
&= -\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{(ib)\int \left(-2d^3+\frac{4d^2}{\frac{1}{d}-\frac{icx}{d}}-d^2(d+icdx)\right) d}{3d}\\
&= -\frac{2}{3}ibd^2x-\frac{bd^2(1+icx)^2}{6c}-\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{4bd^2\log(1-}{3c}
\end{aligned}
$$

Mathematica [A] time = 0.04, size = 57, normalized size = 0.69

$$\frac{1}{3}d^2\left(-\frac{(cx-i)^3\left(a+b\tan^{-1}(cx)\right)}{c}+\frac{1}{2}bx(cx-6i)-\frac{4b\log(cx+i)}{c}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + I*c*d*x)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d^2*((b*x*(-6*I + c*x))/2 - ((-I + c*x)^3*(a + b*ArcTan[c*x]))/c - (4*b*Lo
g[I + c*x])/c))/3
```

fricas [A] time = 0.46, size = 127, normalized size = 1.53

$$-\frac{2\,ac^3d^2x^3-(6i\,a+b)c^2d^2x^2-6\,(a-i\,b)cd^2x+7\,bd^2\log\left(\frac{cx+i}{c}\right)+bd^2\log\left(\frac{cx-i}{c}\right)-\left(-i\,bc^3d^2x^3-3\,bc^2d^2x^2+3i\,b\right.}{6\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] -1/6*(2*a*c^3*d^2*x^3 - (6*I*a + b)*c^2*d^2*x^2 - 6*(a - I*b)*c*d^2*x + 7*b
*d^2*log((c*x + I)/c) + b*d^2*log((c*x - I)/c) - (-I*b*c^3*d^2*x^3 - 3*b*c^
2*d^2*x^2 + 3*I*b*c*d^2*x)*log(-(c*x + I)/(c*x - I)))/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 133, normalized size = 1.60

$$-\frac{c^2d^2a\,x^3}{3}+ic\,x^2a\,d^2+ax\,d^2-\frac{id^2a}{3c}-\frac{c^2d^2b\arctan\left(cx\right)x^3}{3}+ic\,d^2b\arctan\left(cx\right)x^2+b\arctan\left(cx\right)d^2x+\frac{id^2b\arctan\left(cx\right)}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x)),x)
```

```
[Out] -1/3*c^2*d^2*a*x^3+I*c*x^2*a*d^2+a*x*d^2-1/3*I/c*d^2*a-1/3*c^2*d^2*b*arctan
(c*x)*x^3+I*c*d^2*b*arctan(c*x)*x^2+b*arctan(c*x)*d^2*x+I/c*d^2*b*arctan(c*
x)-I*d^2*b*x+1/6*c*d^2*b*x^2-2/3/c*d^2*b*ln(c^2*x^2+1)
```

maxima [B] time = 0.41, size = 138, normalized size = 1.66

$$-\frac{1}{3}\,ac^2d^2x^3-\frac{1}{6}\left(2\,x^3\arctan\left(cx\right)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)bc^2d^2+i\,acd^2x^2+i\left(x^2\arctan\left(cx\right)-c\left(\frac{x}{c^2}-\frac{\arctan\left(cx\right)}{c^3}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/3*a*c^2*d^2*x^3 - 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)
/c^4))*b*c^2*d^2 + I*a*c*d^2*x^2 + I*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c
*x)/c^3))*b*c*d^2 + a*d^2*x + 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*
d^2/c
```

mupad [B] time = 0.40, size = 109, normalized size = 1.31

$$\frac{d^2\,\left(6\,a\,x+6\,b\,x\,\mathrm{atan}\left(c\,x\right)-b\,x\,6\mathrm{i}\right)}{6}-\frac{c^2\,d^2\,\left(2\,a\,x^3+2\,b\,x^3\,\mathrm{atan}\left(c\,x\right)\right)}{6}+\frac{d^2\,\left(-4\,b\,\ln\left(c^2\,x^2+1\right)+b\,\mathrm{atan}\left(c\,x\right)\,6\mathrm{i}\right)}{6\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + c*d*x*1i)^2,x)
```

```
[Out] (d^2*(6*a*x - b*x*6i + 6*b*x*atan(c*x)))/6 - (c^2*d^2*(2*a*x^3 + 2*b*x^3*at
an(c*x)))/6 + (d^2*(b*atan(c*x)*6i - 4*b*log(c^2*x^2 + 1)))/(6*c) + (c*d^2*
(a*x^2*6i + b*x^2 + b*x^2*atan(c*x)*6i))/6
```

sympy [B] time = 3.23, size = 206, normalized size = 2.48

$$-\frac{ac^2d^2x^3}{3}-\frac{bd^2\left(\frac{\log\left(13bcd^2x-13ibd^2\right)}{6}+\frac{17\log\left(13bcd^2x+13ibd^2\right)}{24}\right)}{c}-x^2\left(-iacd^2-\frac{bcd^2}{6}\right)-x\left(-ad^2+ibd^2\right)+\left(\frac{ibc^2d^2x^3}{6}+\frac{b}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x)),x)
```

```
[Out] -a*c**2*d**2*x**3/3 - b*d**2*(log(13*b*c*d**2*x - 13*I*b*d**2)/6 + 17*log(1
3*b*c*d**2*x + 13*I*b*d**2)/24)/c - x**2*(-I*a*c*d**2 - b*c*d**2/6) - x*(-a
*d**2 + I*b*d**2) + (I*b*c**2*d**2*x**3/6 + b*c*d**2*x**2/2 - I*b*d**2*x/2)
*log(I*c*x + 1) - (4*I*b*c**3*d**2*x**3 + 12*b*c**2*d**2*x**2 - 12*I*b*c*d*
*2*x + 11*b*d**2)*log(-I*c*x + 1)/(24*c)
```

3.14 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=129

$$-\frac{1}{2}c^2d^2x^2\left(a+b\tan^{-1}(cx)\right)+2iacd^2x+ad^2\log(x)-ibd^2\log\left(c^2x^2+1\right)+\frac{1}{2}ibd^2\text{Li}_2(-icx)-\frac{1}{2}ibd^2\text{Li}_2(icx)+\frac{1}{2}bcd^2x-\frac{1}{2}$$

```
[Out] 2*I*a*c*d^2*x+1/2*b*c*d^2*x-1/2*b*d^2*arctan(c*x)+2*I*b*c*d^2*x*arctan(c*x)
-1/2*c^2*d^2*x^2*(a+b*arctan(c*x))+a*d^2*ln(x)-I*b*d^2*ln(c^2*x^2+1)+1/2*I*
b*d^2*polylog(2,-I*c*x)-1/2*I*b*d^2*polylog(2,I*c*x)
```

Rubi [A] time = 0.13, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4876, 4846, 260, 4848, 2391, 4852, 321, 203}

$$\frac{1}{2}ibd^2\text{PolyLog}(2,-icx)-\frac{1}{2}ibd^2\text{PolyLog}(2,icx)-\frac{1}{2}c^2d^2x^2\left(a+b\tan^{-1}(cx)\right)+2iacd^2x+ad^2\log(x)-ibd^2\log\left(c^2x^2+\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] (2*I)*a*c*d^2*x + (b*c*d^2*x)/2 - (b*d^2*ArcTan[c*x])/2 + (2*I)*b*c*d^2*x*A
rcTan[c*x] - (c^2*d^2*x^2*(a + b*ArcTan[c*x]))/2 + a*d^2*Log[x] - I*b*d^2*L
og[1 + c^2*x^2] + (I/2)*b*d^2*PolyLog[2, (-I)*c*x] - (I/2)*b*d^2*PolyLog[2,
 I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
```

```
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x}\,dx = \int \left(2icd^2\left(a+b\tan^{-1}(cx)\right)+\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}-c^2d^2x\left(a+b\tan^{-1}(c\right.\right.$$
$$= d^2\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+\left(2icd^2\right)\int \left(a+b\tan^{-1}(cx)\right)dx-\left(c^2d^2\right)\int x\,($$
$$= 2iacd^2x-\frac{1}{2}c^2d^2x^2\left(a+b\tan^{-1}(cx)\right)+ad^2\log(x)+\frac{1}{2}\left(ibd^2\right)\int \frac{\log(1-}{x}$$
$$= 2iacd^2x+\frac{1}{2}bcd^2x+2ibcd^2x\tan^{-1}(cx)-\frac{1}{2}c^2d^2x^2\left(a+b\tan^{-1}(cx)\right)+ad$$
$$= 2iacd^2x+\frac{1}{2}bcd^2x-\frac{1}{2}bd^2\tan^{-1}(cx)+2ibcd^2x\tan^{-1}(cx)-\frac{1}{2}c^2d^2x^2\left(a+\right.$$

Mathematica [A] time = 0.10, size = 103, normalized size = 0.80

$$-\frac{1}{2}d^2\left(ac^2x^2-4iacx-2a\log(x)+2ib\log\left(c^2x^2+1\right)+bc^2x^2\tan^{-1}(cx)-ib\text{Li}_2(-icx)+ib\text{Li}_2(icx)-bcx-4ibc\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] -1/2*(d^2*((-4*I)*a*c*x - b*c*x + a*c^2*x^2 + b*ArcTan[c*x] - (4*I)*b*c*x*A
rcTan[c*x] + b*c^2*x^2*ArcTan[c*x] - 2*a*Log[x] + (2*I)*b*Log[1 + c^2*x^2]
- I*b*PolyLog[2, (-I)*c*x] + I*b*PolyLog[2, I*c*x]))
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{2\,ac^2d^2x^2-4i\,acd^2x-2\,ad^2-\left(-i\,bc^2d^2x^2-2\,bcd^2x+i\,bd^2\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(-1/2*(2*a*c^2*d^2*x^2 - 4*I*a*c*d^2*x - 2*a*d^2 - (-I*b*c^2*d^2*x^
2 - 2*b*c*d^2*x + I*b*d^2)*log(-(c*x + I)/(c*x - I)))/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 177, normalized size = 1.37

$$2iac\,d^2x - \frac{d^2a\,c^2x^2}{2} + a\,d^2\ln(cx) + 2ibc\,d^2x\arctan(cx) - \frac{d^2b\arctan(cx)\,c^2x^2}{2} + d^2b\ln(cx)\arctan(cx) + \frac{bc\,d^2x}{2} - ib\,d^2\,l$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))/x,x)
```

```
[Out] 2*I*a*c*d^2*x-1/2*d^2*a*c^2*x^2+a*d^2*ln(c*x)+2*I*b*c*d^2*x*arctan(c*x)-1/2
*d^2*b*arctan(c*x)*c^2*x^2+d^2*b*ln(c*x)*arctan(c*x)+1/2*b*c*d^2*x-I*b*d^2*
ln(c^2*x^2+1)-1/2*b*d^2*arctan(c*x)+1/2*I*d^2*b*ln(c*x)*ln(1+I*c*x)-1/2*I*d
^2*b*ln(c*x)*ln(1-I*c*x)+1/2*I*d^2*b*dilog(1+I*c*x)-1/2*I*d^2*b*dilog(1-I*c
*x)
```

maxima [A] time = 0.61, size = 142, normalized size = 1.10

$$-\frac{1}{2}ac^2d^2x^2 + 2i\,acd^2x + \frac{1}{2}bcd^2x - \frac{1}{4}\pi bd^2\log\left(c^2x^2+1\right) + bd^2\arctan(cx)\log(cx) + i\left(2\,cx\arctan(cx) - \log\left(c^2x^2 + \right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] -1/2*a*c^2*d^2*x^2 + 2*I*a*c*d^2*x + 1/2*b*c*d^2*x - 1/4*pi*b*d^2*log(c^2*x
^2 + 1) + b*d^2*arctan(c*x)*log(c*x) + I*(2*c*x*arctan(c*x) - log(c^2*x^2 +
 1))*b*d^2 - 1/2*I*b*d^2*dilog(I*c*x + 1) + 1/2*I*b*d^2*dilog(-I*c*x + 1) +
 a*d^2*log(x) - 1/2*(b*c^2*d^2*x^2 + b*d^2)*arctan(c*x)
```

mupad [B] time = 0.73, size = 131, normalized size = 1.02

$$\begin{cases} a\,d^2\,\ln(x) \\ \frac{b\,c\,d^2\,x}{2} + \frac{a\,d^2\,\left(2\,\ln(x) - c^2\,x^2 + c\,x\,4\mathrm{i}\right)}{2} - \frac{b\,d^2\,\mathrm{Li_2}(1 - c\,x\,1\mathrm{i})\,1\mathrm{i}}{2} + \frac{b\,d^2\,\mathrm{Li_2}(1 + c\,x\,1\mathrm{i})\,1\mathrm{i}}{2} - b\,d^2\,\ln\left(c^2\,x^2+1\right)\,1\mathrm{i} - b\,c^2\,d^2\,\mathrm{atan}(c\,x)\,\left(\frac{1}{2\,c^2}\right.\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^2)/x,x)
```

```
[Out] piecewise(c == 0, a*d^2*log(x), c ~= 0, - b*d^2*log(c^2*x^2 + 1)*1i + (a*d^
2*(2*log(x) + c*x*4i - c^2*x^2))/2 - (b*d^2*dilog(- c*x*1i + 1)*1i)/2 + (b*
d^2*dilog(c*x*1i + 1)*1i)/2 + (b*c*d^2*x)/2 - b*c^2*d^2*atan(c*x)*(1/(2*c^2
) + x^2/2) + b*c*d^2*x*atan(c*x)*2i)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-d^2\left(\int\left(-\frac{a}{x}\right)dx + \int(-2iac)\,dx + \int ac^2x\,dx + \int\left(-\frac{b\,\mathrm{atan}(cx)}{x}\right)dx + \int(-2ibc\,\mathrm{atan}(cx))\,dx + \int bc^2x\,\mathrm{atan}(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))/x,x)
```

```
[Out] -d**2*(Integral(-a/x, x) + Integral(-2*I*a*c, x) + Integral(a*c**2*x, x) +
Integral(-b*atan(c*x)/x, x) + Integral(-2*I*b*c*atan(c*x), x) + Integral(b*
c**2*x*atan(c*x), x))
```

3.15 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=89

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}-ac^2d^2x+2iacd^2\log(x)-bc^2d^2x\tan^{-1}(cx)-bcd^2\text{Li}_2(-icx)+bcd^2\text{Li}_2(icx)+bcd^2\log(x)$$

```
[Out] -a*c^2*d^2*x-b*c^2*d^2*x*arctan(c*x)-d^2*(a+b*arctan(c*x))/x+2*I*a*c*d^2*ln
(x)+b*c*d^2*ln(x)-b*c*d^2*polylog(2,-I*c*x)+b*c*d^2*polylog(2,I*c*x)
```

Rubi [A] time = 0.14, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.435$, Rules used = {4876, 4846, 260, 4852, 266, 36, 29, 31, 4848, 2391}

$$-bcd^2\text{PolyLog}(2,-icx)+bcd^2\text{PolyLog}(2,icx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}-ac^2d^2x+2iacd^2\log(x)-bc^2d^2x\tan^{-1}(cx)+$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -(a*c^2*d^2*x) - b*c^2*d^2*x*ArcTan[c*x] - (d^2*(a + b*ArcTan[c*x]))/x + (2
*I)*a*c*d^2*Log[x] + b*c*d^2*Log[x] - b*c*d^2*PolyLog[2, (-I)*c*x] + b*c*d^
2*PolyLog[2, I*c*x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx = \int \left(-c^2d^2\left(a+b\tan^{-1}(cx)\right)+\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x^2}+\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x}\right.$$

$$= d^2\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx+\left(2icd^2\right)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx-\left(c^2d^2\right)\int \left(a+b\right.$$

$$= -ac^2d^2x-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2iacd^2\log(x)+\left(bcd^2\right)\int \frac{1}{x\left(1+c^2x^2\right)}\,dx$$

$$= -ac^2d^2x-bc^2d^2x\tan^{-1}(cx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2iacd^2\log(x)-bcd^2\mathrm{L}$$

$$= -ac^2d^2x-bc^2d^2x\tan^{-1}(cx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2iacd^2\log(x)+\frac{1}{2}bcd^2$$

$$= -ac^2d^2x-bc^2d^2x\tan^{-1}(cx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2iacd^2\log(x)+bcd^2\,\mathrm{l}$$

Mathematica [A] time = 0.10, size = 79, normalized size = 0.89

$$-\frac{d^2\left(ac^2x^2-2iacx\log(x)+a+bc^2x^2\tan^{-1}(cx)+bcx\mathrm{Li}_2(-icx)-bcx\mathrm{Li}_2(icx)-bcx\log(cx)+b\tan^{-1}(cx)\right)}{x}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -((d^2*(a + a*c^2*x^2 + b*ArcTan[c*x] + b*c^2*x^2*ArcTan[c*x] - (2*I)*a*c*x
*Log[x] - b*c*x*Log[c*x] + b*c*x*PolyLog[2, (-I)*c*x] - b*c*x*PolyLog[2, I*
c*x]))/x)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{2\,ac^2d^2x^2-4i\,acd^2x-2\,ad^2-\left(-i\,bc^2d^2x^2-2\,bcd^2x+i\,bd^2\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(-1/2*(2*a*c^2*d^2*x^2 - 4*I*a*c*d^2*x - 2*a*d^2 - (-I*b*c^2*d^2*x^
2 - 2*b*c*d^2*x + I*b*d^2)*log(-(c*x + I)/(c*x - I)))/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 152, normalized size = 1.71

$$-a\,c^2d^2x+2ic\,d^2a\ln(cx)-\frac{d^2a}{x}-b\,c^2d^2x\arctan(cx)+2ic\,d^2b\arctan(cx)\ln(cx)-\frac{d^2b\arctan(cx)}{x}-c\,d^2b\ln(cx)\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] -a*c^2*d^2*x+2*I*c*d^2*a*ln(c*x)-d^2*a/x-b*c^2*d^2*x*arctan(c*x)+2*I*c*d^2*
b*arctan(c*x)*ln(c*x)-d^2*b*arctan(c*x)/x-c*d^2*b*ln(c*x)*ln(1+I*c*x)+c*d^2
*b*ln(c*x)*ln(1-I*c*x)-c*d^2*b*dilog(1+I*c*x)+c*d^2*b*dilog(1-I*c*x)+c*d^2*
b*ln(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-ac^2d^2x-\frac{1}{2}\left(2\,cx\arctan(cx)-\log\left(c^2x^2+1\right)\right)bcd^2+2i\,bcd^2\int\frac{\arctan(cx)}{x}\,dx+2i\,acd^2\log(x)-\frac{1}{2}\left(c\left(\log\left(c^2x^2+\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -a*c^2*d^2*x - 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*c*d^2 + 2*I*b*c
*d^2*integrate(arctan(c*x)/x, x) + 2*I*a*c*d^2*log(x) - 1/2*(c*(log(c^2*x^2
 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d^2 - a*d^2/x
```

mupad [B] time = 0.60, size = 141, normalized size = 1.58

$$\begin{cases} -\frac{a\,d^2}{x} \\ \frac{b\,d^2\left(c^2\,\ln(x)-\frac{c^2\,\ln\left(c^2\,x^2+1\right)}{2}\right)}{c}+b\,c\,d^2\,\left(\mathrm{Li}_2\left(1-c\,x\,1\mathrm{i}\right)-\mathrm{Li}_2\left(1+c\,x\,1\mathrm{i}\right)\right)+\frac{b\,c\,d^2\,\ln\left(c^2\,x^2+1\right)}{2}-\frac{a\,d^2\,\left(c^2\,x^2+1-c\,x\,\ln(x)\,2\mathrm{i}\right)}{x}-\frac{b\,d}{} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^2)/x^2,x)
```

```
[Out] piecewise(c == 0, -(a*d^2)/x, c ~= 0, (b*d^2*(c^2*log(x) - (c^2*log(c^2*x^2
 + 1))/2))/c + b*c*d^2*(dilog(- c*x*1i + 1) - dilog(c*x*1i + 1)) + (b*c*d^2
*log(c^2*x^2 + 1))/2 - (a*d^2*(c^2*x^2 - c*x*log(x)*2i + 1))/x - (b*d^2*ata
n(c*x))/x - b*c^2*d^2*x*atan(c*x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-d^2\left(\int ac^2\,dx + \int\left(-\frac{a}{x^2}\right)dx + \int bc^2\operatorname{atan}(cx)\,dx + \int\left(-\frac{b\operatorname{atan}(cx)}{x^2}\right)dx + \int\left(-\frac{2iac}{x}\right)dx + \int\left(-\frac{2ibc\operatorname{atan}(c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))/x**2,x)
```

```
[Out] -d**2*(Integral(a*c**2, x) + Integral(-a/x**2, x) + Integral(b*c**2*atan(c*
x), x) + Integral(-b*atan(c*x)/x**2, x) + Integral(-2*I*a*c/x, x) + Integra
l(-2*I*b*c*atan(c*x)/x, x))
```

3.16 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=152

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x}-ac^2d^2\log(x)-\frac{1}{2}ibc^2d^2\text{Li}_2(-icx)+\frac{1}{2}ibc^2d^2\text{Li}_2(icx)-ibc^2d^2\log\left(\right.$$

```
[Out] -1/2*b*c*d^2/x-1/2*b*c^2*d^2*arctan(c*x)-1/2*d^2*(a+b*arctan(c*x))/x^2-2*I*
c*d^2*(a+b*arctan(c*x))/x-a*c^2*d^2*ln(x)+2*I*b*c^2*d^2*ln(x)-I*b*c^2*d^2*l
n(c^2*x^2+1)-1/2*I*b*c^2*d^2*polylog(2,-I*c*x)+1/2*I*b*c^2*d^2*polylog(2,I*
c*x)
```

Rubi [A] time = 0.15, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4852, 325, 203, 266, 36, 29, 31, 4848, 2391}

$$-\frac{1}{2}ibc^2d^2\text{PolyLog}(2,-icx)+\frac{1}{2}ibc^2d^2\text{PolyLog}(2,icx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x}-ac^2d^2\log$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -(b*c*d^2)/(2*x) - (b*c^2*d^2*ArcTan[c*x])/2 - (d^2*(a + b*ArcTan[c*x]))/(2
*x^2) - ((2*I)*c*d^2*(a + b*ArcTan[c*x]))/x - a*c^2*d^2*Log[x] + (2*I)*b*c^
2*d^2*Log[x] - I*b*c^2*d^2*Log[1 + c^2*x^2] - (I/2)*b*c^2*d^2*PolyLog[2, (-
I)*c*x] + (I/2)*b*c^2*d^2*PolyLog[2, I*c*x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
```

```
b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx &= \int\left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x^3}+\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x^2}-\frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{x}\right.\\
&= d^2\int\frac{a+b\tan^{-1}(cx)}{x^3}\,dx+\left(2icd^2\right)\int\frac{a+b\tan^{-1}(cx)}{x^2}\,dx-\left(c^2d^2\right)\int\frac{a+b\tan^{-1}(cx)}{}\\
&= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x}-ac^2d^2\log(x)+\frac{1}{2}\left(bcd^2\right)\\
&= -\frac{bcd^2}{2x}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x}-ac^2d^2\log(x)-\frac{1}{2}\\
&= -\frac{bcd^2}{2x}-\frac{1}{2}bc^2d^2\tan^{-1}(cx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x}\\
&= -\frac{bcd^2}{2x}-\frac{1}{2}bc^2d^2\tan^{-1}(cx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{x}
\end{aligned}$$

Mathematica [C] time = 0.08, size = 139, normalized size = 0.91

$$-\frac{d^2\left(2ac^2x^2\log(x)+4iacx+a+bcx\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)+ibc^2x^2\text{Li}_2(-icx)-ibc^2x^2\text{Li}_2(icx)-4ibc^2x^2\log(x)+\right.}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^3,x]
```

[Out] -1/2*(d^2*(a + (4*I)*a*c*x + b*ArcTan[c*x] + (4*I)*b*c*x*ArcTan[c*x] + b*c*x*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)] + 2*a*c^2*x^2*Log[x] - (4*I)*b*c^2*x^2*Log[x] + (2*I)*b*c^2*x^2*Log[1 + c^2*x^2] + I*b*c^2*x^2*PolyLog[2, (-I)*c*x] - I*b*c^2*x^2*PolyLog[2, I*c*x]))/x^2

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(-\frac{2\,ac^2d^2x^2 - 4i\,acd^2x - 2\,ad^2 - \left(-i\,bc^2d^2x^2 - 2\,bcd^2x + i\,bd^2\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")

[Out] integral(-1/2*(2*a*c^2*d^2*x^2 - 4*I*a*c*d^2*x - 2*a*d^2 - (-I*b*c^2*d^2*x^2 - 2*b*c*d^2*x + I*b*d^2)*log(-(c*x + I)/(c*x - I)))/x^3, x)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^3,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 0.07, size = 217, normalized size = 1.43

$$-c^2d^2a\ln(cx)-\frac{2ic\,d^2a}{x}-\frac{d^2a}{2x^2}-c^2d^2b\ln(cx)\arctan(cx)-\frac{2ic\,d^2b\arctan(cx)}{x}-\frac{d^2b\arctan(cx)}{2x^2}-\frac{ic^2d^2b\ln(cx)\ln(}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^3,x)

[Out] -c^2*d^2*a*ln(c*x)-2*I*c*d^2*a/x-1/2*d^2*a/x^2-c^2*d^2*b*ln(c*x)*arctan(c*x)-2*I*c*d^2*b*arctan(c*x)/x-1/2*d^2*b*arctan(c*x)/x^2-1/2*I*c^2*d^2*b*ln(c*x)*ln(1+I*c*x)+1/2*I*c^2*d^2*b*ln(c*x)*ln(1-I*c*x)-1/2*I*c^2*d^2*b*dilog(1+I*c*x)+1/2*I*c^2*d^2*b*dilog(1-I*c*x)-1/2*b*c*d^2/x+2*I*c^2*d^2*b*ln(c*x)-I*b*c^2*d^2*ln(c^2*x^2+1)-1/2*b*c^2*d^2*arctan(c*x)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-bc^2d^2\int\frac{\arctan(cx)}{x}\,dx-ac^2d^2\log(x)-i\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bcd^2-\frac{1}{2}\left(\left(c\arctan(cx\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")

[Out] -b*c^2*d^2*integrate(arctan(c*x)/x, x) - a*c^2*d^2*log(x) - I*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c*d^2 - 1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d^2 - 2*I*a*c*d^2/x - 1/2*a*d^2/x^2

mupad [B] time = 0.74, size = 161, normalized size = 1.06

$$\begin{cases} -\frac{a\,d^2}{2\,x^2} \\ b\,d^2\left(c^2\,\ln(x)-\frac{c^2\,\ln\left(c^2\,x^2+1\right)}{2}\right)2\mathrm{i}+\frac{b\,c^2\,d^2\,\mathrm{Li}_2(1-c\,x\,1\mathrm{i})\,1\mathrm{i}}{2}-\frac{b\,c^2\,d^2\,\mathrm{Li}_2(1+c\,x\,1\mathrm{i})\,1\mathrm{i}}{2}-\frac{b\,d^2\left(c^3\,\mathrm{atan}(c\,x)+\frac{c^2}{x}\right)}{2\,c}-\frac{a\,d^2\left(2\,c^2\,x^2\,\ln(x)+\right.}{2\,x^2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^2)/x^3,x)
```

```
[Out] piecewise(c == 0, -(a*d^2)/(2*x^2), c ~= 0, b*d^2*(c^2*log(x) - (c^2*log(c^
2*x^2 + 1))/2)*2i + (b*c^2*d^2*dilog(- c*x*1i + 1)*1i)/2 - (b*c^2*d^2*dilog
(c*x*1i + 1)*1i)/2 - (b*d^2*(c^3*atan(c*x) + c^2/x))/(2*c) - (a*d^2*(c*x*4i
 + 2*c^2*x^2*log(x) + 1))/(2*x^2) - (b*d^2*atan(c*x))/(2*x^2) - (b*c*d^2*at
an(c*x)*2i)/x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-d^2\left(\int\left(-\frac{a}{x^3}\right)dx+\int\frac{ac^2}{x}\,dx+\int\left(-\frac{b\operatorname{atan}(cx)}{x^3}\right)dx+\int\left(-\frac{2iac}{x^2}\right)dx+\int\frac{bc^2\operatorname{atan}(cx)}{x}\,dx+\int\left(-\frac{2ibc\operatorname{atan}(c\right.}{x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))/x**3,x)
```

```
[Out] -d**2*(Integral(-a/x**3, x) + Integral(a*c**2/x, x) + Integral(-b*atan(c*x)
/x**3, x) + Integral(-2*I*a*c/x**2, x) + Integral(b*c**2*atan(c*x)/x, x) +
Integral(-2*I*b*c*atan(c*x)/x**2, x))
```

3.17 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=87

$$-\frac{d^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{4}{3}bc^3d^2\log(x)+\frac{4}{3}bc^3d^2\log(cx+i)-\frac{ibc^2d^2}{x}-\frac{bcd^2}{6x^2}$$

```
[Out] -1/6*b*c*d^2/x^2-I*b*c^2*d^2/x-1/3*d^2*(1+I*c*x)^3*(a+b*arctan(c*x))/x^3-4/
3*b*c^3*d^2*ln(x)+4/3*b*c^3*d^2*ln(I+c*x)
```

Rubi [A] time = 0.08, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {37, 4872, 12, 88}

$$-\frac{d^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{ibc^2d^2}{x}-\frac{4}{3}bc^3d^2\log(x)+\frac{4}{3}bc^3d^2\log(cx+i)-\frac{bcd^2}{6x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*d^2)/(6*x^2) - (I*b*c^2*d^2)/x - (d^2*(1 + I*c*x)^3*(a + b*ArcTan[c*x
]))/(3*x^3) - (4*b*c^3*d^2*Log[x])/3 + (4*b*c^3*d^2*Log[I + c*x])/3
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 88

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x
_))^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*
x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && IntegersQ[m, n] && (Inte
gerQ[p] || (GtQ[m, 0] && GeQ[n, -1]))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx = -\frac{d^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3x^3} - (bc)\int \frac{id^2(i-cx)^2}{3x^3(i+cx)}\,dx$$
$$= -\frac{d^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{1}{3}\left(ibcd^2\right)\int \frac{(i-cx)^2}{x^3(i+cx)}\,dx$$
$$= -\frac{d^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{1}{3}\left(ibcd^2\right)\int \left(\frac{i}{x^3} - \frac{3c}{x^2} - \frac{4ic^2}{x} + \frac{4ic^3}{i+cx}\right) d$$
$$= -\frac{bcd^2}{6x^2} - \frac{ibc^2d^2}{x} - \frac{d^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{4}{3}bc^3d^2\log(x) + \frac{4}{3}bc^3d^2$$

Mathematica [C] time = 0.10, size = 114, normalized size = 1.31

$$-\frac{d^2\left(-6ac^2x^2+6iacx+2a+8bc^3x^3\log(x)+6ibc^2x^2\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)+2b\left(-3c^2x^2+3icx+1\right)\tan^{-1}(cx)-4}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -1/6*(d^2*(2*a + (6*I)*a*c*x + b*c*x - 6*a*c^2*x^2 + 2*b*(1 + (3*I)*c*x - 3
*c^2*x^2)*ArcTan[c*x] + (6*I)*b*c^2*x^2*Hypergeometric2F1[-1/2, 1, 1/2, -(c
^2*x^2)] + 8*b*c^3*x^3*Log[x] - 4*b*c^3*x^3*Log[1 + c^2*x^2]))/x^3
```

fricas [A] time = 0.44, size = 144, normalized size = 1.66

$$-\frac{8\,bc^3d^2x^3\log(x) - 7\,bc^3d^2x^3\log\left(\frac{cx+i}{c}\right) - bc^3d^2x^3\log\left(\frac{cx-i}{c}\right) - 6\,(a-i\,b)c^2d^2x^2 - (-6i\,a-b)cd^2x + 2\,ad^2 - \left(3i\,bc\right.}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] -1/6*(8*b*c^3*d^2*x^3*log(x) - 7*b*c^3*d^2*x^3*log((c*x + I)/c) - b*c^3*d^2
*x^3*log((c*x - I)/c) - 6*(a - I*b)*c^2*d^2*x^2 - (-6*I*a - b)*c*d^2*x + 2*
a*d^2 - (3*I*b*c^2*d^2*x^2 + 3*b*c*d^2*x - I*b*d^2)*log(-(c*x + I)/(c*x - I
)))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 145, normalized size = 1.67

$$-\frac{d^2a}{3x^3}+\frac{c^2d^2a}{x}-\frac{ic\,d^2a}{x^2}-\frac{d^2b\arctan(cx)}{3x^3}+\frac{c^2d^2b\arctan(cx)}{x}-\frac{ic\,d^2b\arctan(cx)}{x^2}-\frac{ib\,c^2d^2}{x}-\frac{bc\,d^2}{6x^2}-\frac{4c^3d^2b\ln(cx)}{3}+\frac{2c^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] -1/3*d^2*a/x^3+c^2*d^2*a/x-I*c*d^2*a/x^2-1/3*d^2*b*arctan(c*x)/x^3+c^2*d^2*
b*arctan(c*x)/x-I*c*d^2*b*arctan(c*x)/x^2-I*b*c^2*d^2/x-1/6*b*c*d^2/x^2-4/3
*c^3*d^2*b*ln(c*x)+2/3*c^3*d^2*b*ln(c^2*x^2+1)-I*c^3*d^2*b*arctan(c*x)
```

maxima [A] time = 0.41, size = 144, normalized size = 1.66

$$\frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan\left(cx\right)}{x}\right)bc^2d^2-i\left(\left(c\arctan\left(cx\right)+\frac{1}{x}\right)c+\frac{\arctan\left(cx\right)}{x^2}\right)bcd^2+\frac{1}{6}\left(\left(c^2\log\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c^2*d^2 - I*((c*a
rctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*c*d^2 + 1/6*((c^2*log(c^2*x^2 + 1)
 - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*d^2 + a*c^2*d^2/x - I*a*c
*d^2/x^2 - 1/3*a*d^2/x^3
```

mupad [B] time = 0.64, size = 120, normalized size = 1.38

$$-\frac{d^2\,\left(8\,b\,c^3\,\ln(x)-4\,b\,c^3\,\ln\left(c^2\,x^2+1\right)+b\,c^3\,\mathrm{atan}\left(c\,x\right)\,6\mathrm{i}\right)}{6}-\frac{\frac{d^2\,\left(2\,a+2\,b\,\mathrm{atan}\left(c\,x\right)\right)}{6}+\frac{d^2\,x\,\left(a\,c\,6\mathrm{i}+b\,c+b\,c\,\mathrm{atan}\left(c\,x\right)\,6\mathrm{i}\right)}{6}-\frac{d^2\,x^2}{\quad}}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^2)/x^4,x)
```

```
[Out] - (d^2*(b*c^3*atan(c*x)*6i - 4*b*c^3*log(c^2*x^2 + 1) + 8*b*c^3*log(x)))/6
- ((d^2*(2*a + 2*b*atan(c*x)))/6 + (d^2*x*(a*c*6i + b*c + b*c*atan(c*x)*6i)
)/6 - (d^2*x^2*(6*a*c^2 - b*c^2*6i + 6*b*c^2*atan(c*x)))/6)/x^3
```

sympy [B] time = 9.28, size = 253, normalized size = 2.91

$$-\frac{4bc^3d^2\log\left(135b^2c^7d^4x\right)}{3}+\frac{bc^3d^2\log\left(135b^2c^7d^4x-135ib^2c^6d^4\right)}{6}+\frac{7bc^3d^2\log\left(135b^2c^7d^4x+135ib^2c^6d^4\right)}{6}-\frac{2aa}{\quad}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))/x**4,x)
```

```
[Out] -4*b*c**3*d**2*log(135*b**2*c**7*d**4*x)/3 + b*c**3*d**2*log(135*b**2*c**7*
d**4*x - 135*I*b**2*c**6*d**4)/6 + 7*b*c**3*d**2*log(135*b**2*c**7*d**4*x +
 135*I*b**2*c**6*d**4)/6 - (2*a*d**2 + x**2*(-6*a*c**2*d**2 + 6*I*b*c**2*d*
*2) + x*(6*I*a*c*d**2 + b*c*d**2))/(6*x**3) + (-3*I*b*c**2*d**2*x**2 - 3*b*
c*d**2*x + I*b*d**2)*log(I*c*x + 1)/(6*x**3) + (3*I*b*c**2*d**2*x**2 + 3*b*
c*d**2*x - I*b*d**2)*log(-I*c*x + 1)/(6*x**3)
```

3.18 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=161

$$\frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{2}{3}ibc^4d^2\log(x)-\frac{1}{24}ibc^4d^2\log(-cx+i)+\frac{17}{24}i$$

```
[Out] -1/12*b*c*d^2/x^3-1/3*I*b*c^2*d^2/x^2+3/4*b*c^3*d^2/x-1/4*d^2*(a+b*arctan(c
*x))/x^4-2/3*I*c*d^2*(a+b*arctan(c*x))/x^3+1/2*c^2*d^2*(a+b*arctan(c*x))/x^
2-2/3*I*b*c^4*d^2*ln(x)-1/24*I*b*c^4*d^2*ln(I-c*x)+17/24*I*b*c^4*d^2*ln(I+c
*x)
```

Rubi [A] time = 0.15, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {43, 4872, 12, 1802}

$$\frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{ibc^2d^2}{3x^2}+\frac{3bc^3d^2}{4x}-\frac{2}{3}ibc^4d^2\log(x)-\frac{1}{24}ibc^4d^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(b*c*d^2)/(12*x^3) - ((I/3)*b*c^2*d^2)/x^2 + (3*b*c^3*d^2)/(4*x) - (d^2*(a
 + b*ArcTan[c*x]))/(4*x^4) - (((2*I)/3)*c*d^2*(a + b*ArcTan[c*x]))/x^3 + (c
^2*d^2*(a + b*ArcTan[c*x]))/(2*x^2) - ((2*I)/3)*b*c^4*d^2*Log[x] - (I/24)*b
*c^4*d^2*Log[I - c*x] + ((17*I)/24)*b*c^4*d^2*Log[I + c*x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx = -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} + \frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} + \frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{2icd^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} + \frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}$$

$$= -\frac{bcd^2}{12x^3} - \frac{ibc^2d^2}{3x^2} + \frac{3bc^3d^2}{4x} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{2icd^2\left(a+b\tan^{-1}(cx\right.}{3x^3}$$

Mathematica [C] time = 0.07, size = 152, normalized size = 0.94

$$\frac{d^2\left(6ac^2x^2 - 8iacx - 3a - 8ibc^4x^4\log(x) - bcx\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right) - 4ibc^2x^2 + 6bc^2x^2\tan^{-1}(cx) + 4ibc^4x^4\,\mathrm{l}\right.}{12x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] (d^2*(-3*a - (8*I)*a*c*x + 6*a*c^2*x^2 - (4*I)*b*c^2*x^2 - 3*b*ArcTan[c*x]
- (8*I)*b*c*x*ArcTan[c*x] + 6*b*c^2*x^2*ArcTan[c*x] - b*c*x*Hypergeometric2
F1[-3/2, 1, -1/2, -(c^2*x^2)] + 6*b*c^3*x^3*Hypergeometric2F1[-1/2, 1, 1/2,
 -(c^2*x^2)] - (8*I)*b*c^4*x^4*Log[x] + (4*I)*b*c^4*x^4*Log[1 + c^2*x^2]))/
(12*x^4)
```

fricas [A] time = 0.49, size = 156, normalized size = 0.97

$$\frac{-16i\,bc^4d^2x^4\log(x) + 17i\,bc^4d^2x^4\log\left(\frac{cx+i}{c}\right) - i\,bc^4d^2x^4\log\left(\frac{cx-i}{c}\right) + 18\,bc^3d^2x^3 + 4\,(3\,a-2i\,b)c^2d^2x^2 + (-16i\,a\right.}{24\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] 1/24*(-16*I*b*c^4*d^2*x^4*log(x) + 17*I*b*c^4*d^2*x^4*log((c*x + I)/c) - I*
b*c^4*d^2*x^4*log((c*x - I)/c) + 18*b*c^3*d^2*x^3 + 4*(3*a - 2*I*b)*c^2*d^2
*x^2 + (-16*I*a - 2*b)*c*d^2*x - 6*a*d^2 + (6*I*b*c^2*d^2*x^2 + 8*b*c*d^2*x
 - 3*I*b*d^2)*log(-(c*x + I)/(c*x - I)))/x^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 160, normalized size = 0.99

$$-\frac{2ic\,d^2a}{3x^3} - \frac{d^2a}{4x^4} + \frac{c^2d^2a}{2x^2} - \frac{2ic\,d^2b\arctan(cx)}{3x^3} - \frac{d^2b\arctan(cx)}{4x^4} + \frac{c^2d^2b\arctan(cx)}{2x^2} - \frac{ib\,c^2d^2}{3x^2} - \frac{2ic^4d^2b\ln(cx)}{3} - \frac{bc\,d^2}{12x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] -2/3*I*c*d^2*a/x^3-1/4*d^2*a/x^4+1/2*c^2*d^2*a/x^2-2/3*I*c*d^2*b*arctan(c*x
)/x^3-1/4*d^2*b*arctan(c*x)/x^4+1/2*c^2*d^2*b*arctan(c*x)/x^2-1/3*I*b*c^2*d
^2/x^2-2/3*I*c^4*d^2*b*ln(c*x)-1/12*b*c*d^2/x^3+3/4*b*c^3*d^2/x+1/3*I*c^4*d
^2*b*ln(c^2*x^2+1)+3/4*b*c^4*d^2*arctan(c*x)
```

maxima [A] time = 0.41, size = 152, normalized size = 0.94

$$\frac{1}{2}\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bc^2d^2+\frac{1}{3}i\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bcd^2+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] 1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*c^2*d^2 + 1/3*I*((c^2*log
(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*c*d^2 + 1/12
*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*d^2 +
1/2*a*c^2*d^2/x^2 - 2/3*I*a*c*d^2/x^3 - 1/4*a*d^2/x^4
```

mupad [B] time = 0.70, size = 142, normalized size = 0.88

$$\frac{d^2\left(9\,b\,c^3\,\mathrm{atan}\left(x\,\sqrt{c^2}\right)\,\sqrt{c^2}\,+b\,c^4\,\ln\left(c^2\,x^2+1\right)\,4\mathrm{i}-b\,c^4\,\ln(x)\,8\mathrm{i}\right)}{12}-\frac{\frac{d^2\,(3\,a+3\,b\,\mathrm{atan}(c\,x))}{12}+\frac{d^2\,x\,(a\,c\,8\mathrm{i}+b\,c+b\,c\,\mathrm{atan}(c\,x)\,8\mathrm{i})}{12}}{x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^2)/x^5,x)
```

```
[Out] (d^2*(b*c^4*log(c^2*x^2 + 1)*4i - b*c^4*log(x)*8i + 9*b*c^3*atan(x*(c^2)^(1
/2))*(c^2)^(1/2)))/12 - ((d^2*(3*a + 3*b*atan(c*x)))/12 + (d^2*x*(a*c*8i +
b*c + b*c*atan(c*x)*8i))/12 - (d^2*x^2*(6*a*c^2 - b*c^2*4i + 6*b*c^2*atan(c
*x)))/12 - (3*b*c^3*d^2*x^3)/4)/x^4
```

sympy [A] time = 16.39, size = 275, normalized size = 1.71

$$-\frac{2ibc^4d^2\log\left(1485b^2c^9d^4x\right)}{3}-\frac{ibc^4d^2\log\left(1485b^2c^9d^4x-1485ib^2c^8d^4\right)}{24}+\frac{17ibc^4d^2\log\left(1485b^2c^9d^4x+1485ib^2c^8d^4\right)}{24}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))/x**5,x)
```

```
[Out] -2*I*b*c**4*d**2*log(1485*b**2*c**9*d**4*x)/3 - I*b*c**4*d**2*log(1485*b**2
*c**9*d**4*x - 1485*I*b**2*c**8*d**4)/24 + 17*I*b*c**4*d**2*log(1485*b**2*c
**9*d**4*x + 1485*I*b**2*c**8*d**4)/24 + (-6*I*b*c**2*d**2*x**2 - 8*b*c*d**
2*x + 3*I*b*d**2)*log(I*c*x + 1)/(24*x**4) + (6*I*b*c**2*d**2*x**2 + 8*b*c*
d**2*x - 3*I*b*d**2)*log(-I*c*x + 1)/(24*x**4) - (3*a*d**2 - 9*b*c**3*d**2*
x**3 + x**2*(-6*a*c**2*d**2 + 4*I*b*c**2*d**2) + x*(8*I*a*c*d**2 + b*c*d**2
))/(12*x**4)
```

3.19 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx$

Optimal. Leaf size=171

$$\frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{icd^2\left(a+b\tan^{-1}(cx)\right)}{2x^4}+\frac{8}{15}bc^5d^2\log(x)-\frac{1}{60}bc^5d^2\log(-cx+i)-\frac{31}{60}$$

```
[Out] -1/20*b*c*d^2/x^4-1/6*I*b*c^2*d^2/x^3+4/15*b*c^3*d^2/x^2+1/2*I*b*c^4*d^2/x-
1/5*d^2*(a+b*arctan(c*x))/x^5-1/2*I*c*d^2*(a+b*arctan(c*x))/x^4+1/3*c^2*d^2
*(a+b*arctan(c*x))/x^3+8/15*b*c^5*d^2*ln(x)-1/60*b*c^5*d^2*ln(I-c*x)-31/60*
b*c^5*d^2*ln(I+c*x)
```

Rubi [A] time = 0.16, antiderivative size = 171, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {43, 4872, 12, 1802}

$$\frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{icd^2\left(a+b\tan^{-1}(cx)\right)}{2x^4}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{4bc^3d^2}{15x^2}-\frac{ibc^2d^2}{6x^3}+\frac{ibc^4d^2}{2x}+\frac{8}{15}bc^5d^2\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -(b*c*d^2)/(20*x^4) - ((I/6)*b*c^2*d^2)/x^3 + (4*b*c^3*d^2)/(15*x^2) + ((I/
2)*b*c^4*d^2)/x - (d^2*(a + b*ArcTan[c*x]))/(5*x^5) - ((I/2)*c*d^2*(a + b*A
rcTan[c*x]))/x^4 + (c^2*d^2*(a + b*ArcTan[c*x]))/(3*x^3) + (8*b*c^5*d^2*Log
[x])/15 - (b*c^5*d^2*Log[I - c*x])/60 - (31*b*c^5*d^2*Log[I + c*x])/60
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx = -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5} - \frac{icd^2\left(a+b\tan^{-1}(cx)\right)}{2x^4} + \frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - (\ldots$$
$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5} - \frac{icd^2\left(a+b\tan^{-1}(cx)\right)}{2x^4} + \frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \ldots$$
$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5} - \frac{icd^2\left(a+b\tan^{-1}(cx)\right)}{2x^4} + \frac{c^2d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \ldots$$
$$= -\frac{bcd^2}{20x^4} - \frac{ibc^2d^2}{6x^3} + \frac{4bc^3d^2}{15x^2} + \frac{ibc^4d^2}{2x} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5} - \frac{icd^2\left(a+b\tan\ldots\right)}{2x^4}$$

Mathematica [C] time = 0.09, size = 124, normalized size = 0.73

$$\frac{d^2\left(20ac^2x^2 - 30iacx - 12a + 32bc^5x^5\log(x) + 16bc^3x^3 - 10ibc^2x^2\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right) + 2b\left(10c^2x^2 - 15icx - \ldots\right.\right.}{60x^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] (d^2*(-12*a - (30*I)*a*c*x - 3*b*c*x + 20*a*c^2*x^2 + 16*b*c^3*x^3 + 2*b*(-
6 - (15*I)*c*x + 10*c^2*x^2)*ArcTan[c*x] - (10*I)*b*c^2*x^2*Hypergeometric2
F1[-3/2, 1, -1/2, -(c^2*x^2)] + 32*b*c^5*x^5*Log[x] - 16*b*c^5*x^5*Log[1 +
c^2*x^2]))/(60*x^5)
```

fricas [A] time = 0.45, size = 168, normalized size = 0.98

$$\frac{32\,bc^5d^2x^5\log(x) - 31\,bc^5d^2x^5\log\left(\frac{cx+i}{c}\right) - bc^5d^2x^5\log\left(\frac{cx-i}{c}\right) + 30i\,bc^4d^2x^4 + 16\,bc^3d^2x^3 + 10\,(2\,a - i\,b)c^2d^2x^2 + \ldots}{60\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] 1/60*(32*b*c^5*d^2*x^5*log(x) - 31*b*c^5*d^2*x^5*log((c*x + I)/c) - b*c^5*d
^2*x^5*log((c*x - I)/c) + 30*I*b*c^4*d^2*x^4 + 16*b*c^3*d^2*x^3 + 10*(2*a -
 I*b)*c^2*d^2*x^2 + (-30*I*a - 3*b)*c*d^2*x - 12*a*d^2 + (10*I*b*c^2*d^2*x^
2 + 15*b*c*d^2*x - 6*I*b*d^2)*log(-(c*x + I)/(c*x - I)))/x^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 172, normalized size = 1.01

$$\frac{c^2d^2a}{3x^3} - \frac{ic\,d^2a}{2x^4} - \frac{d^2a}{5x^5} + \frac{c^2d^2b\arctan(cx)}{3x^3} - \frac{ic\,d^2b\arctan(cx)}{2x^4} - \frac{d^2b\arctan(cx)}{5x^5} - \frac{ib\,c^2d^2}{6x^3} + \frac{ib\,c^4d^2}{2x} - \frac{bc\,d^2}{20x^4} + \frac{4b\,c^3d^2}{15x^2} + \frac{8c^5\ldots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^6,x)
```

```
[Out] 1/3*c^2*d^2*a/x^3-1/2*I*c*d^2*a/x^4-1/5*d^2*a/x^5+1/3*c^2*d^2*b*arctan(c*x)
/x^3-1/2*I*c*d^2*b*arctan(c*x)/x^4-1/5*d^2*b*arctan(c*x)/x^5-1/6*I*b*c^2*d^
2/x^3+1/2*I*b*c^4*d^2/x-1/20*b*c*d^2/x^4+4/15*b*c^3*d^2/x^2+8/15*c^5*d^2*b*
ln(c*x)-4/15*c^5*d^2*b*ln(c^2*x^2+1)+1/2*I*c^5*d^2*b*arctan(c*x)
```

maxima [A] time = 0.42, size = 183, normalized size = 1.07

$$-\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bc^2d^2+\frac{1}{6}i\left(\left(3c^3\arctan(cx)+\frac{3c^2x^2-1}{x^3}\right)c-\frac{3\,\mathrm{ar}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*
b*c^2*d^2 + 1/6*I*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c
*x)/x^4)*b*c*d^2 - 1/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*
x^2 - 1)/x^4)*c + 4*arctan(c*x)/x^5)*b*d^2 + 1/3*a*c^2*d^2/x^3 - 1/2*I*a*c*
d^2/x^4 - 1/5*a*d^2/x^5
```

mupad [B] time = 0.92, size = 244, normalized size = 1.43

$$\frac{8\,b\,c^5\,d^2\,\ln(x)}{15}-\frac{4\,b\,c^5\,d^2\,\ln\left(c^2\,x^2+1\right)}{15}-\frac{\frac{a\,d^2}{5}+\frac{b\,d^2\,\mathrm{atan}(c\,x)}{5}-\frac{4\,b\,c^5\,d^2\,x^5}{15}-\frac{b\,c^6\,d^2\,x^6\,1\mathrm{i}}{2}-\frac{c^4\,d^2\,x^4\,(a+b\,1\mathrm{i})}{3}+\frac{c\,d^2\,x\,(b+a\,10\mathrm{i})}{20}-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^2)/x^6,x)
```

```
[Out] (8*b*c^5*d^2*log(x))/15 - (4*b*c^5*d^2*log(c^2*x^2 + 1))/15 - ((a*d^2)/5 +
(b*d^2*atan(c*x))/5 - (4*b*c^5*d^2*x^5)/15 - (b*c^6*d^2*x^6*1i)/2 - (c^4*d^
2*x^4*(a + b*1i))/3 + (c*d^2*x*(a*10i + b))/20 - (c^2*d^2*x^2*(4*a - b*5i))
/30 + (c^3*d^2*x^3*(a*30i - 13*b))/60 - (2*b*c^2*d^2*x^2*atan(c*x))/15 + (b
*c^3*d^2*x^3*atan(c*x)*1i)/2 - (b*c^4*d^2*x^4*atan(c*x))/3 + (b*c*d^2*x*ata
n(c*x)*1i)/2)/(x^5 + c^2*x^7) + (b*c^8*d^2*atan((c^2*x)/(c^2)^(1/2))*1i)/(2
*(c^2)^(3/2))
```

sympy [A] time = 26.07, size = 287, normalized size = 1.68

$$\frac{8bc^5d^2\log\left(10395b^2c^{11}d^4x\right)}{15}-\frac{bc^5d^2\log\left(10395b^2c^{11}d^4x-10395ib^2c^{10}d^4\right)}{60}-\frac{31bc^5d^2\log\left(10395b^2c^{11}d^4x+103\right.}{60}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))/x**6,x)
```

```
[Out] 8*b*c**5*d**2*log(10395*b**2*c**11*d**4*x)/15 - b*c**5*d**2*log(10395*b**2*
c**11*d**4*x - 10395*I*b**2*c**10*d**4)/60 - 31*b*c**5*d**2*log(10395*b**2*
c**11*d**4*x + 10395*I*b**2*c**10*d**4)/60 + (-10*I*b*c**2*d**2*x**2 - 15*b
*c*d**2*x + 6*I*b*d**2)*log(I*c*x + 1)/(60*x**5) + (10*I*b*c**2*d**2*x**2 +
 15*b*c*d**2*x - 6*I*b*d**2)*log(-I*c*x + 1)/(60*x**5) - (12*a*d**2 - 30*I*
b*c**4*d**2*x**4 - 16*b*c**3*d**2*x**3 + x**2*(-20*a*c**2*d**2 + 10*I*b*c**
2*d**2) + x*(30*I*a*c*d**2 + 3*b*c*d**2))/(60*x**5)
```

3.20 $\int x^3(d + icdx)^3 \left(a + b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=205

$$-\frac{1}{7}ic^3d^3x^7\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}c^2d^3x^6\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}icd^3x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}d^3x^4\left(a+b\tan^{-1}(cx)\right)-\frac{3ba}{}$$

```
[Out] 3/4*b*d^3*x/c^3+13/35*I*b*d^3*x^2/c^2-1/4*b*d^3*x^3/c-13/70*I*b*d^3*x^4+1/1
0*b*c*d^3*x^5+1/42*I*b*c^2*d^3*x^6-3/4*b*d^3*arctan(c*x)/c^4+1/4*d^3*x^4*(a
+b*arctan(c*x))+3/5*I*c*d^3*x^5*(a+b*arctan(c*x))-1/2*c^2*d^3*x^6*(a+b*arct
an(c*x))-1/7*I*c^3*d^3*x^7*(a+b*arctan(c*x))-13/35*I*b*d^3*ln(c^2*x^2+1)/c^
4
```

Rubi [A] time = 0.18, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {43, 4872, 12, 1802, 635, 203, 260}

$$-\frac{1}{7}ic^3d^3x^7\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}c^2d^3x^6\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}icd^3x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}d^3x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{42}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (3*b*d^3*x)/(4*c^3) + (((13*I)/35)*b*d^3*x^2)/c^2 - (b*d^3*x^3)/(4*c) - ((1
3*I)/70)*b*d^3*x^4 + (b*c*d^3*x^5)/10 + (I/42)*b*c^2*d^3*x^6 - (3*b*d^3*Arc
Tan[c*x])/(4*c^4) + (d^3*x^4*(a + b*ArcTan[c*x]))/4 + ((3*I)/5)*c*d^3*x^5*(
a + b*ArcTan[c*x]) - (c^2*d^3*x^6*(a + b*ArcTan[c*x]))/2 - (I/7)*c^3*d^3*x^
7*(a + b*ArcTan[c*x]) - (((13*I)/35)*b*d^3*Log[1 + c^2*x^2])/c^4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^3(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)dx = \frac{1}{4}d^3x^4\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}icd^3x^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}c^2d^3x^6\left(a+b\right.$$

$$= \frac{1}{4}d^3x^4\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}icd^3x^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}c^2d^3x^6\left(a+b\right.$$

$$= \frac{1}{4}d^3x^4\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}icd^3x^5\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}c^2d^3x^6\left(a+b\right.$$

$$= \frac{3bd^3x}{4c^3}+\frac{13ibd^3x^2}{35c^2}-\frac{bd^3x^3}{4c}-\frac{13}{70}ibd^3x^4+\frac{1}{10}bcd^3x^5+\frac{1}{42}ibc^2d^3x^6+\frac{1}{4}$$

$$= \frac{3bd^3x}{4c^3}+\frac{13ibd^3x^2}{35c^2}-\frac{bd^3x^3}{4c}-\frac{13}{70}ibd^3x^4+\frac{1}{10}bcd^3x^5+\frac{1}{42}ibc^2d^3x^6+\frac{1}{4}$$

$$= \frac{3bd^3x}{4c^3}+\frac{13ibd^3x^2}{35c^2}-\frac{bd^3x^3}{4c}-\frac{13}{70}ibd^3x^4+\frac{1}{10}bcd^3x^5+\frac{1}{42}ibc^2d^3x^6-\frac{3}{}$$

Mathematica [A] time = 0.12, size = 248, normalized size = 1.21

$$-\frac{1}{7}iac^3d^3x^7-\frac{1}{2}ac^2d^3x^6+\frac{3}{5}iacd^3x^5+\frac{1}{4}ad^3x^4-\frac{3bd^3\tan^{-1}(cx)}{4c^4}-\frac{1}{7}ibc^3d^3x^7\tan^{-1}(cx)+\frac{3bd^3x}{4c^3}+\frac{1}{42}ibc^2d^3x^6-\frac{1}{2}bc^2d$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (3*b*d^3*x)/(4*c^3) + (((13*I)/35)*b*d^3*x^2)/c^2 - (b*d^3*x^3)/(4*c) + (a*
d^3*x^4)/4 - ((13*I)/70)*b*d^3*x^4 + ((3*I)/5)*a*c*d^3*x^5 + (b*c*d^3*x^5)/
10 - (a*c^2*d^3*x^6)/2 + (I/42)*b*c^2*d^3*x^6 - (I/7)*a*c^3*d^3*x^7 - (3*b*
d^3*ArcTan[c*x])/(4*c^4) + (b*d^3*x^4*ArcTan[c*x])/4 + ((3*I)/5)*b*c*d^3*x^
5*ArcTan[c*x] - (b*c^2*d^3*x^6*ArcTan[c*x])/2 - (I/7)*b*c^3*d^3*x^7*ArcTan[
c*x] - (((13*I)/35)*b*d^3*Log[1 + c^2*x^2])/c^4
```

fricas [A] time = 0.45, size = 200, normalized size = 0.98

$$\frac{-120i\,ac^7d^3x^7-20\,(21\,a-i\,b)c^6d^3x^6+(504i\,a+84\,b)c^5d^3x^5+6\,(35\,a-26i\,b)c^4d^3x^4-210\,bc^3d^3x^3+312i\,bc^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/840*(-120*I*a*c^7*d^3*x^7 - 20*(21*a - I*b)*c^6*d^3*x^6 + (504*I*a + 84*b
)*c^5*d^3*x^5 + 6*(35*a - 26*I*b)*c^4*d^3*x^4 - 210*b*c^3*d^3*x^3 + 312*I*b
```

```
*c^2*d^3*x^2 + 630*b*c*d^3*x - 627*I*b*d^3*log((c*x + I)/c) + 3*I*b*d^3*log
((c*x - I)/c) + (60*b*c^7*d^3*x^7 - 210*I*b*c^6*d^3*x^6 - 252*b*c^5*d^3*x^5
 + 105*I*b*c^4*d^3*x^4)*log(-(c*x + I)/(c*x - I)))/c^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 209, normalized size = 1.02

$$\frac{3ic\,d^3b\arctan(cx)\,x^5}{5}-\frac{c^2d^3a\,x^6}{2}-\frac{ic^3d^3b\arctan(cx)\,x^7}{7}+\frac{d^3a\,x^4}{4}+\frac{13ib\,d^3x^2}{35c^2}-\frac{c^2d^3b\arctan(cx)\,x^6}{2}+\frac{3ic\,d^3a\,x^5}{5}+\frac{d^3b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x)
```

```
[Out] 3/5*I*c*d^3*b*arctan(c*x)*x^5-1/2*c^2*d^3*a*x^6-1/7*I*c^3*d^3*b*arctan(c*x)
*x^7+1/4*d^3*a*x^4+13/35*I*b*d^3*x^2/c^2-1/2*c^2*d^3*b*arctan(c*x)*x^6+3/5*
I*c*d^3*a*x^5+1/4*d^3*b*arctan(c*x)*x^4+3/4*b*d^3*x/c^3-13/70*I*b*d^3*x^4+1
/10*b*c*d^3*x^5-1/7*I*c^3*d^3*a*x^7-1/4*b*d^3*x^3/c+1/42*I*b*c^2*d^3*x^6-13
/35*I*b*d^3*ln(c^2*x^2+1)/c^4-3/4*b*d^3*arctan(c*x)/c^4
```

maxima [A] time = 0.41, size = 261, normalized size = 1.27

$$-\frac{1}{7}i\,ac^3d^3x^7-\frac{1}{2}\,ac^2d^3x^6+\frac{3}{5}i\,acd^3x^5-\frac{1}{84}i\left(12\,x^7\arctan(cx)-c\left(\frac{2\,c^4x^6-3\,c^2x^4+6\,x^2}{c^6}-\frac{6\,\log\left(c^2x^2+1\right)}{c^8}\right)\right)bc^3d^3+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/7*I*a*c^3*d^3*x^7 - 1/2*a*c^2*d^3*x^6 + 3/5*I*a*c*d^3*x^5 - 1/84*I*(12*x
^7*arctan(c*x) - c*((2*c^4*x^6 - 3*c^2*x^4 + 6*x^2)/c^6 - 6*log(c^2*x^2 + 1
)/c^8))*b*c^3*d^3 + 1/4*a*d^3*x^4 - 1/30*(15*x^6*arctan(c*x) - c*((3*c^4*x^
5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*c^2*d^3 + 3/20*I*(4*x^5*
arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*c*d^3 +
 1/12*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*d
^3
```

mupad [B] time = 0.89, size = 186, normalized size = 0.91

$$-\frac{\frac{d^3\left(315\,b\,\mathrm{atan}(c\,x)+b\,\ln\left(c^2\,x^2+1\right)156\mathrm{i}\right)}{420}+\frac{b\,c^3\,d^3\,x^3}{4}-\frac{3\,b\,c\,d^3\,x}{4}-\frac{b\,c^2\,d^3\,x^2\,13\mathrm{i}}{35}}{c^4}+\frac{d^3\,\left(105\,a\,x^4+105\,b\,x^4\,\mathrm{atan}\left(c\,x\right)-b\,x^4\,78\mathrm{i}\right)}{420}-\frac{c^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + c*d*x*1i)^3,x)
```

```
[Out] (d^3*(105*a*x^4 - b*x^4*78i + 105*b*x^4*atan(c*x)))/420 - ((d^3*(315*b*atan
(c*x) + b*log(c^2*x^2 + 1)*156i))/420 - (b*c^2*d^3*x^2*13i)/35 + (b*c^3*d^3
*x^3)/4 - (3*b*c*d^3*x)/4)/c^4 - (c^3*d^3*(a*x^7*60i + b*x^7*atan(c*x)*60i)
)/420 + (c*d^3*(a*x^5*252i + 42*b*x^5 + b*x^5*atan(c*x)*252i))/420 - (c^2*d
^3*(210*a*x^6 - b*x^6*10i + 210*b*x^6*atan(c*x)))/420
```

sympy [A] time = 5.38, size = 328, normalized size = 1.60

$$-\frac{iac^3d^3x^7}{7}-\frac{bd^3x^3}{4c}+\frac{13ibd^3x^2}{35c^2}+\frac{3bd^3x}{4c^3}-\frac{bd^3\left(-\frac{i\log\left(353bcd^3x-353ibd^3\right)}{280}+\frac{351i\log\left(353bcd^3x+353ibd^3\right)}{560}\right)}{c^4}-x^6\left(\frac{ac^2d^3}{2}-\frac{ibc^2d^3}{42}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+I*c*d*x)**3*(a+b*atan(c*x)),x)
```

```
[Out] -I*a*c**3*d**3*x**7/7 - b*d**3*x**3/(4*c) + 13*I*b*d**3*x**2/(35*c**2) + 3*
b*d**3*x/(4*c**3) - b*d**3*(-I*log(353*b*c*d**3*x - 353*I*b*d**3)/280 + 351
*I*log(353*b*c*d**3*x + 353*I*b*d**3)/560)/c**4 - x**6*(a*c**2*d**3/2 - I*b
*c**2*d**3/42) - x**5*(-3*I*a*c*d**3/5 - b*c*d**3/10) - x**4*(-a*d**3/4 + 1
3*I*b*d**3/70) + (-b*c**3*d**3*x**7/14 + I*b*c**2*d**3*x**6/4 + 3*b*c*d**3*
x**5/10 - I*b*d**3*x**4/8)*log(I*c*x + 1) - (-40*b*c**7*d**3*x**7 + 140*I*b
*c**6*d**3*x**6 + 168*b*c**5*d**3*x**5 - 70*I*b*c**4*d**3*x**4 + 67*I*b*d**
3)*log(-I*c*x + 1)/(560*c**4)
```

3.21 $\int x^2(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=191

$$-\frac{1}{6}ic^3d^3x^6\left(a+b\tan^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}icd^3x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)-\frac{11i}{}$$

```
[Out] 11/12*I*b*d^3*x/c^2-7/15*b*d^3*x^2/c-11/36*I*b*d^3*x^3+3/20*b*c*d^3*x^4+1/3
0*I*b*c^2*d^3*x^5-11/12*I*b*d^3*arctan(c*x)/c^3+1/3*d^3*x^3*(a+b*arctan(c*x
))+3/4*I*c*d^3*x^4*(a+b*arctan(c*x))-3/5*c^2*d^3*x^5*(a+b*arctan(c*x))-1/6*
I*c^3*d^3*x^6*(a+b*arctan(c*x))+7/15*b*d^3*ln(c^2*x^2+1)/c^3
```

Rubi [A] time = 0.17, antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {43, 4872, 12, 1802, 635, 203, 260}

$$-\frac{1}{6}ic^3d^3x^6\left(a+b\tan^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}icd^3x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{30}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (((11*I)/12)*b*d^3*x)/c^2 - (7*b*d^3*x^2)/(15*c) - ((11*I)/36)*b*d^3*x^3 +
(3*b*c*d^3*x^4)/20 + (I/30)*b*c^2*d^3*x^5 - (((11*I)/12)*b*d^3*ArcTan[c*x])
/c^3 + (d^3*x^3*(a + b*ArcTan[c*x]))/3 + ((3*I)/4)*c*d^3*x^4*(a + b*ArcTan[
c*x]) - (3*c^2*d^3*x^5*(a + b*ArcTan[c*x]))/5 - (I/6)*c^3*d^3*x^6*(a + b*Ar
cTan[c*x]) + (7*b*d^3*Log[1 + c^2*x^2])/(15*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^2(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)dx = \frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}icd^3x^4\left(a+b\tan^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\right.$$

$$= \frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}icd^3x^4\left(a+b\tan^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\right.$$

$$= \frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}icd^3x^4\left(a+b\tan^{-1}(cx)\right)-\frac{3}{5}c^2d^3x^5\left(a+b\right.$$

$$= \frac{11ibd^3x}{12c^2}-\frac{7bd^3x^2}{15c}-\frac{11}{36}ibd^3x^3+\frac{3}{20}bcd^3x^4+\frac{1}{30}ibc^2d^3x^5+\frac{1}{3}d^3x^3\left(a+\right.$$

$$= \frac{11ibd^3x}{12c^2}-\frac{7bd^3x^2}{15c}-\frac{11}{36}ibd^3x^3+\frac{3}{20}bcd^3x^4+\frac{1}{30}ibc^2d^3x^5+\frac{1}{3}d^3x^3\left(a+\right.$$

$$= \frac{11ibd^3x}{12c^2}-\frac{7bd^3x^2}{15c}-\frac{11}{36}ibd^3x^3+\frac{3}{20}bcd^3x^4+\frac{1}{30}ibc^2d^3x^5-\frac{11ibd^3\tan}{12c^3}$$

Mathematica [A] time = 0.09, size = 234, normalized size = 1.23

$$-\frac{1}{6}iac^3d^3x^6-\frac{3}{5}ac^2d^3x^5+\frac{3}{4}iacd^3x^4+\frac{1}{3}ad^3x^3-\frac{1}{6}ibc^3d^3x^6\tan^{-1}(cx)-\frac{11ibd^3\tan^{-1}(cx)}{12c^3}+\frac{1}{30}ibc^2d^3x^5-\frac{3}{5}bc^2d^3x^5\tan$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (((11*I)/12)*b*d^3*x)/c^2 - (7*b*d^3*x^2)/(15*c) + (a*d^3*x^3)/3 - ((11*I)/
36)*b*d^3*x^3 + ((3*I)/4)*a*c*d^3*x^4 + (3*b*c*d^3*x^4)/20 - (3*a*c^2*d^3*x
^5)/5 + (I/30)*b*c^2*d^3*x^5 - (I/6)*a*c^3*d^3*x^6 - (((11*I)/12)*b*d^3*Arc
Tan[c*x])/c^3 + (b*d^3*x^3*ArcTan[c*x])/3 + ((3*I)/4)*b*c*d^3*x^4*ArcTan[c*
x] - (3*b*c^2*d^3*x^5*ArcTan[c*x])/5 - (I/6)*b*c^3*d^3*x^6*ArcTan[c*x] + (7
*b*d^3*Log[1 + c^2*x^2])/(15*c^3)
```

fricas [A] time = 0.44, size = 188, normalized size = 0.98

$$\frac{-60i\,ac^6d^3x^6-12\,(18\,a-i\,b)c^5d^3x^5+(270i\,a+54\,b)c^4d^3x^4+10\,(12\,a-11i\,b)c^3d^3x^3-168\,bc^2d^3x^2+330i\,bcd}{36}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/360*(-60*I*a*c^6*d^3*x^6 - 12*(18*a - I*b)*c^5*d^3*x^5 + (270*I*a + 54*b)
*c^4*d^3*x^4 + 10*(12*a - 11*I*b)*c^3*d^3*x^3 - 168*b*c^2*d^3*x^2 + 330*I*b
```

```
*c*d^3*x + 333*b*d^3*log((c*x + I)/c) + 3*b*d^3*log((c*x - I)/c) + (30*b*c^
6*d^3*x^6 - 108*I*b*c^5*d^3*x^5 - 135*b*c^4*d^3*x^4 + 60*I*b*c^3*d^3*x^3)*l
og(-(c*x + I)/(c*x - I)))/c^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 197, normalized size = 1.03

$$-\frac{ic^3d^3a\,x^6}{6}-\frac{3c^2d^3a\,x^5}{5}+\frac{3ic\,d^3a\,x^4}{4}+\frac{d^3a\,x^3}{3}-\frac{ic^3d^3b\arctan(cx)\,x^6}{6}-\frac{3c^2d^3b\arctan(cx)\,x^5}{5}+\frac{3ic\,d^3b\arctan(cx)\,x^4}{4}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x)
```

```
[Out] -1/6*I*c^3*d^3*a*x^6-3/5*c^2*d^3*a*x^5+3/4*I*c*d^3*a*x^4+1/3*d^3*a*x^3-1/6*
I*c^3*d^3*b*arctan(c*x)*x^6-3/5*c^2*d^3*b*arctan(c*x)*x^5+3/4*I*c*d^3*b*arc
tan(c*x)*x^4+1/3*d^3*b*arctan(c*x)*x^3+11/12*I*b*d^3*x/c^2+1/30*I*b*c^2*d^3
*x^5+3/20*b*c*d^3*x^4-11/36*I*b*d^3*x^3-7/15*b*d^3*x^2/c+7/15*b*d^3*ln(c^2*
x^2+1)/c^3-11/12*I*b*d^3*arctan(c*x)/c^3
```

maxima [A] time = 0.42, size = 242, normalized size = 1.27

$$-\frac{1}{6}i\,ac^3d^3x^6-\frac{3}{5}\,ac^2d^3x^5+\frac{3}{4}i\,acd^3x^4-\frac{1}{90}i\left(15\,x^6\arctan(cx)-c\left(\frac{3\,c^4x^5-5\,c^2x^3+15\,x}{c^6}-\frac{15\arctan(cx)}{c^7}\right)\right)bc^3d^3-\frac{3}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/6*I*a*c^3*d^3*x^6 - 3/5*a*c^2*d^3*x^5 + 3/4*I*a*c*d^3*x^4 - 1/90*I*(15*x
^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7
))*b*c^3*d^3 - 3/20*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c
^2*x^2 + 1)/c^6))*b*c^2*d^3 + 1/3*a*d^3*x^3 + 1/4*I*(3*x^4*arctan(c*x) - c*
((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*c*d^3 + 1/6*(2*x^3*arctan(c*x)
 - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*d^3
```

mupad [B] time = 0.83, size = 174, normalized size = 0.91

$$-\frac{\frac{d^3\left(-84\,b\,\ln\left(c^2\,x^2+1\right)+b\,\mathrm{atan}(c\,x)\,165\mathrm{i}\right)}{180}+\frac{7\,b\,c^2\,d^3\,x^2}{15}-\frac{b\,c\,d^3\,x\,11\mathrm{i}}{12}}{c^3}+\frac{d^3\,\left(60\,a\,x^3+60\,b\,x^3\,\mathrm{atan}\left(c\,x\right)-b\,x^3\,55\mathrm{i}\right)}{180}-\frac{c^3\,d^3\,\left(a\,x^6\,30\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + c*d*x*1i)^3,x)
```

```
[Out] (d^3*(60*a*x^3 - b*x^3*55i + 60*b*x^3*atan(c*x)))/180 - ((d^3*(b*atan(c*x)*
165i - 84*b*log(c^2*x^2 + 1)))/180 + (7*b*c^2*d^3*x^2)/15 - (b*c*d^3*x*11i)
/12)/c^3 - (c^3*d^3*(a*x^6*30i + b*x^6*atan(c*x)*30i))/180 + (c*d^3*(a*x^4*
135i + 27*b*x^4 + b*x^4*atan(c*x)*135i))/180 - (c^2*d^3*(108*a*x^5 - b*x^5*
6i + 108*b*x^5*atan(c*x)))/180
```

sympy [A] time = 4.90, size = 316, normalized size = 1.65

$$-\frac{iac^3d^3x^6}{6}-\frac{7bd^3x^2}{15c}+\frac{11ibd^3x}{12c^2}-\frac{bd^3\left(-\frac{\log\left(310bcd^3x-310ibd^3\right)}{120}-\frac{209\log\left(310bcd^3x+310ibd^3\right)}{280}\right)}{c^3}-x^5\left(\frac{3ac^2d^3}{5}-\frac{ibc^2d^3}{30}\right)-x^4\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+I*c*d*x)**3*(a+b*atan(c*x)),x)
```

```
[Out] -I*a*c**3*d**3*x**6/6 - 7*b*d**3*x**2/(15*c) + 11*I*b*d**3*x/(12*c**2) - b*
d**3*(-log(310*b*c*d**3*x - 310*I*b*d**3)/120 - 209*log(310*b*c*d**3*x + 31
0*I*b*d**3)/280)/c**3 - x**5*(3*a*c**2*d**3/5 - I*b*c**2*d**3/30) - x**4*(-
3*I*a*c*d**3/4 - 3*b*c*d**3/20) - x**3*(-a*d**3/3 + 11*I*b*d**3/36) + (-b*c
**3*d**3*x**6/12 + 3*I*b*c**2*d**3*x**5/10 + 3*b*c*d**3*x**4/8 - I*b*d**3*x
**3/6)*log(I*c*x + 1) - (-70*b*c**6*d**3*x**6 + 252*I*b*c**5*d**3*x**5 + 31
5*b*c**4*d**3*x**4 - 140*I*b*c**3*d**3*x**3 - 150*b*d**3)*log(-I*c*x + 1)/(
840*c**3)
```

3.22 $\int x(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=157

$$-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}+\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c^2}+\frac{ibd^3(-cx+i)^4}{20c^2}-\frac{bd^3(-cx+i)^3}{20c^2}-\frac{3ibd^3(-cx+i)^2}{20c^2}+$$

```
[Out] -3/5*b*d^3*x/c-3/20*I*b*d^3*(I-c*x)^2/c^2-1/20*b*d^3*(I-c*x)^3/c^2+1/20*I*b
*d^3*(I-c*x)^4/c^2+1/4*d^3*(1+I*c*x)^4*(a+b*arctan(c*x))/c^2-1/5*d^3*(1+I*c
*x)^5*(a+b*arctan(c*x))/c^2+6/5*I*b*d^3*ln(I+c*x)/c^2
```

Rubi [A] time = 0.10, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 4872, 12, 77}

$$-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}+\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c^2}+\frac{ibd^3(-cx+i)^4}{20c^2}-\frac{bd^3(-cx+i)^3}{20c^2}-\frac{3ibd^3(-cx+i)^2}{20c^2}+$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (-3*b*d^3*x)/(5*c) - (((3*I)/20)*b*d^3*(I - c*x)^2)/c^2 - (b*d^3*(I - c*x)^
3)/(20*c^2) + ((I/20)*b*d^3*(I - c*x)^4)/c^2 + (d^3*(1 + I*c*x)^4*(a + b*Ar
cTan[c*x]))/(4*c^2) - (d^3*(1 + I*c*x)^5*(a + b*ArcTan[c*x]))/(5*c^2) + (((
6*I)/5)*b*d^3*Log[I + c*x])/c^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)dx=\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c^2}-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}-(bc)\int$$

$$=\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c^2}-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{\left(bd^3\right)}{}$$

$$=\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c^2}-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{\left(bd^3\right)}{}$$

$$=-\frac{3bd^3x}{5c}-\frac{3ibd^3(i-cx)^2}{20c^2}-\frac{bd^3(i-cx)^3}{20c^2}+\frac{ibd^3(i-cx)^4}{20c^2}+\frac{d^3(1+icx)^4\left(\right.}{}$$

Mathematica [A] time = 0.11, size = 132, normalized size = 0.84

$$\frac{d^3\left(cx\left(acx\left(-4ic^3x^3-15c^2x^2+20icx+10\right)+b\left(ic^3x^3+5c^2x^2-12icx-25\right)\right)+12ib\log\left(c^2x^2+1\right)+b\left(-4ic^5\right.\right.}{20c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d^3*(c*x*(b*(-25 - (12*I)*c*x + 5*c^2*x^2 + I*c^3*x^3) + a*c*x*(10 + (20*I
)*c*x - 15*c^2*x^2 - (4*I)*c^3*x^3)) + b*(25 + 10*c^2*x^2 + (20*I)*c^3*x^3
- 15*c^4*x^4 - (4*I)*c^5*x^5)*ArcTan[c*x] + (12*I)*b*Log[1 + c^2*x^2]))/(20
*c^2)
```

fricas [A] time = 0.44, size = 176, normalized size = 1.12

$$\frac{-8i\,ac^5d^3x^5-2\,(15\,a-i\,b)c^4d^3x^4+(40i\,a+10\,b)c^3d^3x^3+4\,(5\,a-6i\,b)c^2d^3x^2-50\,bcd^3x+49i\,bd^3\log\left(\frac{cx+i}{c}\right)-}{40\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/40*(-8*I*a*c^5*d^3*x^5 - 2*(15*a - I*b)*c^4*d^3*x^4 + (40*I*a + 10*b)*c^3
*d^3*x^3 + 4*(5*a - 6*I*b)*c^2*d^3*x^2 - 50*b*c*d^3*x + 49*I*b*d^3*log((c*x
 + I)/c) - I*b*d^3*log((c*x - I)/c) + (4*b*c^5*d^3*x^5 - 15*I*b*c^4*d^3*x^4
 - 20*b*c^3*d^3*x^3 + 10*I*b*c^2*d^3*x^2)*log(-(c*x + I)/(c*x - I)))/c^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 184, normalized size = 1.17

$$-\frac{ic^3d^3a\,x^5}{5}-\frac{3c^2d^3a\,x^4}{4}+ic\,d^3a\,x^3+\frac{d^3a\,x^2}{2}-\frac{ic^3d^3b\arctan(cx)\,x^5}{5}-\frac{3c^2d^3b\arctan(cx)\,x^4}{4}+ic\,d^3b\arctan(cx)\,x^3+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x)
```

```
[Out] -1/5*I*c^3*d^3*a*x^5-3/4*c^2*d^3*a*x^4+I*c*d^3*a*x^3+1/2*d^3*a*x^2-1/5*I*c^
3*d^3*b*arctan(c*x)*x^5-3/4*c^2*d^3*b*arctan(c*x)*x^4+I*c*d^3*b*arctan(c*x)
*x^3+1/2*d^3*b*arctan(c*x)*x^2-5/4*b*d^3*x/c+1/20*I*c^2*d^3*b*x^4+1/4*c*d^3
*b*x^3-3/5*I*d^3*b*x^2+3/5*I/c^2*d^3*b*ln(c^2*x^2+1)+5/4/c^2*d^3*b*arctan(c
*x)
```

maxima [A] time = 0.42, size = 222, normalized size = 1.41

$$-\frac{1}{5} i\, ac^3d^3x^5 - \frac{3}{4}\, ac^2d^3x^4 - \frac{1}{20} i \left(4\, x^5 \arctan\left(cx\right) - c\left(\frac{c^2x^4 - 2\, x^2}{c^4} + \frac{2\, \log\left(c^2x^2 + 1\right)}{c^6}\right)\right) bc^3d^3 + i\, acd^3x^3 - \frac{1}{4} \left(3\, x^4 \arcta\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/5*I*a*c^3*d^3*x^5 - 3/4*a*c^2*d^3*x^4 - 1/20*I*(4*x^5*arctan(c*x) - c*((
c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*c^3*d^3 + I*a*c*d^3*x^3 -
 1/4*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*c^
2*d^3 + 1/2*I*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*c*
d^3 + 1/2*a*d^3*x^2 + 1/2*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b
*d^3
```

mupad [B] time = 0.73, size = 160, normalized size = 1.02

$$\frac{\frac{d^3\left(25\,b\,\mathrm{atan}(c\,x)+b\,\ln\left(c^2\,x^2+1\right)\,12\mathrm{i}\right)}{20} - \frac{5\,b\,c\,d^3\,x}{4}}{c^2} + \frac{d^3\,\left(10\,a\,x^2 + 10\,b\,x^2\,\mathrm{atan}\left(c\,x\right) - b\,x^2\,12\mathrm{i}\right)}{20} - \frac{c^3\,d^3\,\left(a\,x^5\,4\mathrm{i} + b\,x^5\,\mathrm{atan}\left(c\,x\right)\right.}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + c*d*x*1i)^3,x)
```

```
[Out] ((d^3*(25*b*atan(c*x) + b*log(c^2*x^2 + 1)*12i))/20 - (5*b*c*d^3*x)/4)/c^2
+ (d^3*(10*a*x^2 - b*x^2*12i + 10*b*x^2*atan(c*x)))/20 - (c^3*d^3*(a*x^5*4i
 + b*x^5*atan(c*x)*4i))/20 + (c*d^3*(a*x^3*20i + 5*b*x^3 + b*x^3*atan(c*x)*
20i))/20 - (c^2*d^3*(15*a*x^4 - b*x^4*1i + 15*b*x^4*atan(c*x)))/20
```

sympy [B] time = 4.59, size = 296, normalized size = 1.89

$$-\frac{iac^3d^3x^5}{5} - \frac{5bd^3x}{4c} - \frac{bd^3\left(\frac{i\log\left(19bcd^3x-19ibd^3\right)}{40} - \frac{37i\log\left(19bcd^3x+19ibd^3\right)}{40}\right)}{c^2} - x^4\left(\frac{3ac^2d^3}{4} - \frac{ibc^2d^3}{20}\right) - x^3\left(-iacd^3 - \frac{bcd^3}{4}\right) - x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)**3*(a+b*atan(c*x)),x)
```

```
[Out] -I*a*c**3*d**3*x**5/5 - 5*b*d**3*x/(4*c) - b*d**3*(I*log(19*b*c*d**3*x - 19
*I*b*d**3)/40 - 37*I*log(19*b*c*d**3*x + 19*I*b*d**3)/40)/c**2 - x**4*(3*a*
c**2*d**3/4 - I*b*c**2*d**3/20) - x**3*(-I*a*c*d**3 - b*c*d**3/4) - x**2*(-
a*d**3/2 + 3*I*b*d**3/5) + (-b*c**3*d**3*x**5/10 + 3*I*b*c**2*d**3*x**4/8 +
 b*c*d**3*x**3/2 - I*b*d**3*x**2/4)*log(I*c*x + 1) - (-4*b*c**5*d**3*x**5 +
 15*I*b*c**4*d**3*x**4 + 20*b*c**3*d**3*x**3 - 10*I*b*c**2*d**3*x**2 - 12*I
*b*d**3)*log(-I*c*x + 1)/(40*c**2)
```

3.23 $\int (d+icdx)^3 \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=100

$$-\frac{id^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c}-\frac{bd^3(1+icx)^3}{12c}-\frac{bd^3(1+icx)^2}{4c}-\frac{2bd^3\log(1-icx)}{c}-ibd^3x$$

```
[Out] -I*b*d^3*x-1/4*b*d^3*(1+I*c*x)^2/c-1/12*b*d^3*(1+I*c*x)^3/c-1/4*I*d^3*(1+I*
c*x)^4*(a+b*arctan(c*x))/c-2*b*d^3*ln(1-I*c*x)/c
```

Rubi [A] time = 0.05, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4862, 627, 43}

$$-\frac{id^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c}-\frac{bd^3(1+icx)^3}{12c}-\frac{bd^3(1+icx)^2}{4c}-\frac{2bd^3\log(1-icx)}{c}-ibd^3x$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (-I)*b*d^3*x - (b*d^3*(1 + I*c*x)^2)/(4*c) - (b*d^3*(1 + I*c*x)^3)/(12*c) -
 ((I/4)*d^3*(1 + I*c*x)^4*(a + b*ArcTan[c*x]))/c - (2*b*d^3*Log[1 - I*c*x])
/c
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int (d+icdx)^3\left(a+b\tan^{-1}(cx)\right)dx &= -\frac{id^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c}+\frac{(ib)\int\frac{(d+icdx)^4}{1+c^2x^2}\,dx}{4d}\\
&= -\frac{id^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c}+\frac{(ib)\int\frac{(d+icdx)^3}{\frac{1}{d}-\frac{icx}{d}}\,dx}{4d}\\
&= -\frac{id^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c}+\frac{(ib)\int\left(-4d^4+\frac{8d^3}{\frac{1}{d}-\frac{icx}{d}}-2d^3(d+icdx)-\right.}{4d}\\
&= -ibd^3x-\frac{bd^3(1+icx)^2}{4c}-\frac{bd^3(1+icx)^3}{12c}-\frac{id^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4c}
\end{aligned}$$

Mathematica [A] time = 0.04, size = 77, normalized size = 0.77

$$-\frac{i\left(3(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)-bd^4\left(c^3x^3-6ic^2x^2-21cx+24i\log(cx+i)+4i\right)\right)}{12cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + I*c*d*x)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] ((-1/12*I)*(3*(d + I*c*d*x)^4*(a + b*ArcTan[c*x]) - b*d^4*(4*I - 21*c*x - (
6*I)*c^2*x^2 + c^3*x^3 + (24*I)*Log[I + c*x])))/(c*d)
```

fricas [A] time = 0.43, size = 160, normalized size = 1.60

$$\frac{-6i\,ac^4d^3x^4-2\,(12\,a-i\,b)c^3d^3x^3+(36i\,a+12\,b)c^2d^3x^2+6\,(4\,a-7i\,b)cd^3x-45\,bd^3\log\left(\frac{cx+i}{c}\right)-3\,bd^3\log\left(\frac{cx-i}{c}\right)}{24\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/24*(-6*I*a*c^4*d^3*x^4 - 2*(12*a - I*b)*c^3*d^3*x^3 + (36*I*a + 12*b)*c^2
*d^3*x^2 + 6*(4*a - 7*I*b)*c*d^3*x - 45*b*d^3*log((c*x + I)/c) - 3*b*d^3*lo
g((c*x - I)/c) + (3*b*c^4*d^3*x^4 - 12*I*b*c^3*d^3*x^3 - 18*b*c^2*d^3*x^2 +
 12*I*b*c*d^3*x)*log(-(c*x + I)/(c*x - I)))/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 176, normalized size = 1.76

$$-\frac{ic^3x^4a\,d^3}{4}-c^2d^3a\,x^3+\frac{3ic\,x^2a\,d^3}{2}+xa\,d^3-\frac{id^3a}{4c}-\frac{ic^3d^3b\arctan(cx)\,x^4}{4}-c^2d^3b\arctan(cx)\,x^3+\frac{3ic\,d^3b\arctan(cx)\,x^2}{2}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x)),x)
```

```
[Out] -1/4*I*c^3*x^4*a*d^3-c^2*d^3*a*x^3+3/2*I*c*x^2*a*d^3+x*a*d^3-1/4*I/c*d^3*a-
1/4*I*c^3*d^3*b*arctan(c*x)*x^4-c^2*d^3*b*arctan(c*x)*x^3+3/2*I*c*d^3*b*arc
tan(c*x)*x^2+d^3*b*arctan(c*x)*x+7/4*I/c*d^3*b*arctan(c*x)-7/4*I*d^3*b*x+1/
12*I*c^2*d^3*b*x^3+1/2*c*d^3*b*x^2-1/c*d^3*b*ln(c^2*x^2+1)
```

maxima [B] time = 0.42, size = 197, normalized size = 1.97

$$-\frac{1}{4}i\,ac^3d^3x^4-ac^2d^3x^3-\frac{1}{12}i\left(3\,x^4\arctan(cx)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3\,\arctan(cx)}{c^5}\right)\right)bc^3d^3-\frac{1}{2}\left(2\,x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] -1/4*I*a*c^3*d^3*x^4 - a*c^2*d^3*x^3 - 1/12*I*(3*x^4*arctan(c*x) - c*((c^2*
x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*c^3*d^3 - 1/2*(2*x^3*arctan(c*x) - c
*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*c^2*d^3 + 3/2*I*a*c*d^3*x^2 + 3/2*I*(x
```

```
^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*c*d^3 + a*d^3*x + 1/2*(2*c*
x*arctan(c*x) - log(c^2*x^2 + 1))*b*d^3/c
```

mupad [B] time = 0.69, size = 147, normalized size = 1.47

$$-\frac{d^3\,\left(a\,x\,12\mathrm{i}+21\,b\,x+b\,x\,\mathrm{atan}\left(c\,x\right)\,12\mathrm{i}\right)\,1\mathrm{i}}{12}-\frac{c^3\,d^3\,\left(3\,a\,x^4+3\,b\,x^4\,\mathrm{atan}\left(c\,x\right)\right)\,1\mathrm{i}}{12}+\frac{d^3\,\left(21\,b\,\mathrm{atan}\left(c\,x\right)+b\,\ln\left(c^2\right.\right.}{12\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + c*d*x*1i)^3,x)
```

```
[Out] (d^3*(21*b*atan(c*x) + b*log(c^2*x^2 + 1)*12i)*1i)/(12*c) - (c^3*d^3*(3*a*x
^4 + 3*b*x^4*atan(c*x))*1i)/12 - (d^3*(a*x*12i + 21*b*x + b*x*atan(c*x)*12i
)*1i)/12 + (c*d^3*(18*a*x^2 - b*x^2*6i + 18*b*x^2*atan(c*x))*1i)/12 + (c^2*
d^3*(a*x^3*12i + b*x^3 + b*x^3*atan(c*x)*12i)*1i)/12
```

sympy [B] time = 4.10, size = 267, normalized size = 2.67

$$-\frac{iac^3d^3x^4}{4}-\frac{bd^3\left(\frac{\log\left(22bcd^3x-22ibd^3\right)}{8}+\frac{49\log\left(22bcd^3x+22ibd^3\right)}{40}\right)}{c}-x^3\left(ac^2d^3-\frac{ibc^2d^3}{12}\right)-x^2\left(-\frac{3iacd^3}{2}-\frac{bcd^3}{2}\right)-x\left(-ad^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x)),x)
```

```
[Out] -I*a*c**3*d**3*x**4/4 - b*d**3*(log(22*b*c*d**3*x - 22*I*b*d**3)/8 + 49*log
(22*b*c*d**3*x + 22*I*b*d**3)/40)/c - x**3*(a*c**2*d**3 - I*b*c**2*d**3/12)
 - x**2*(-3*I*a*c*d**3/2 - b*c*d**3/2) - x*(-a*d**3 + 7*I*b*d**3/4) + (-b*c
**3*d**3*x**4/8 + I*b*c**2*d**3*x**3/2 + 3*b*c*d**3*x**2/4 - I*b*d**3*x/2)*
log(I*c*x + 1) - (-5*b*c**4*d**3*x**4 + 20*I*b*c**3*d**3*x**3 + 30*b*c**2*d
**3*x**2 - 20*I*b*c*d**3*x + 26*b*d**3)*log(-I*c*x + 1)/(40*c)
```

3.24 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=170

$$-\frac{1}{3}ic^3d^3x^3\left(a+b\tan^{-1}(cx)\right)-\frac{3}{2}c^2d^3x^2\left(a+b\tan^{-1}(cx)\right)+3iacd^3x+ad^3\log(x)+\frac{1}{6}ibc^2d^3x^2-\frac{5}{3}ibd^3\log\left(c^2x^2+1\right)+\frac{1}{2}$$

```
[Out] 3*I*a*c*d^3*x+3/2*b*c*d^3*x+1/6*I*b*c^2*d^3*x^2-3/2*b*d^3*arctan(c*x)+3*I*b
*c*d^3*x*arctan(c*x)-3/2*c^2*d^3*x^2*(a+b*arctan(c*x))-1/3*I*c^3*d^3*x^3*(a
+b*arctan(c*x))+a*d^3*ln(x)-5/3*I*b*d^3*ln(c^2*x^2+1)+1/2*I*b*d^3*polylog(2
,-I*c*x)-1/2*I*b*d^3*polylog(2,I*c*x)
```

Rubi [A] time = 0.17, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4846, 260, 4848, 2391, 4852, 321, 203, 266, 43}

$$\frac{1}{2}ibd^3\text{PolyLog}(2,-icx)-\frac{1}{2}ibd^3\text{PolyLog}(2,icx)-\frac{1}{3}ic^3d^3x^3\left(a+b\tan^{-1}(cx)\right)-\frac{3}{2}c^2d^3x^2\left(a+b\tan^{-1}(cx)\right)+3iacd^3x+$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] (3*I)*a*c*d^3*x + (3*b*c*d^3*x)/2 + (I/6)*b*c^2*d^3*x^2 - (3*b*d^3*ArcTan[c
*x])/2 + (3*I)*b*c*d^3*x*ArcTan[c*x] - (3*c^2*d^3*x^2*(a + b*ArcTan[c*x]))/
2 - (I/3)*c^3*d^3*x^3*(a + b*ArcTan[c*x]) + a*d^3*Log[x] - ((5*I)/3)*b*d^3*
Log[1 + c^2*x^2] + (I/2)*b*d^3*PolyLog[2, (-I)*c*x] - (I/2)*b*d^3*PolyLog[2
, I*c*x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}
\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x}\,dx &= \int \left(3icd^3\left(a+b\tan^{-1}(cx)\right)+\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}-3c^2d^3x\left(a+b\tan^{-1}(\right.\right. \\
&= d^3\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+\left(3icd^3\right)\int \left(a+b\tan^{-1}(cx)\right)dx-\left(3c^2d^3\right)\int x \\
&= 3iacd^3x-\frac{3}{2}c^2d^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{3}ic^3d^3x^3\left(a+b\tan^{-1}(cx)\right)+ad^3 \\
&= 3iacd^3x+\frac{3}{2}bcd^3x+3ibcd^3x\tan^{-1}(cx)-\frac{3}{2}c^2d^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{3}i \\
&= 3iacd^3x+\frac{3}{2}bcd^3x-\frac{3}{2}bd^3\tan^{-1}(cx)+3ibcd^3x\tan^{-1}(cx)-\frac{3}{2}c^2d^3x^2\left(a+\right. \\
&= 3iacd^3x+\frac{3}{2}bcd^3x+\frac{1}{6}ibc^2d^3x^2-\frac{3}{2}bd^3\tan^{-1}(cx)+3ibcd^3x\tan^{-1}(cx)-
\end{aligned}$$

Mathematica [A] time = 0.14, size = 139, normalized size = 0.82

$$-\frac{1}{6}id^3\left(2ac^3x^3-9iac^2x^2-18acx+6ia\log(x)+2bc^3x^3\tan^{-1}(cx)-bc^2x^2+10b\log\left(c^2x^2+1\right)-9ibc^2x^2\tan^{-1}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] (-1/6*I)*d^3*(-18*a*c*x + (9*I)*b*c*x - (9*I)*a*c^2*x^2 - b*c^2*x^2 + 2*a*c
^3*x^3 - (9*I)*b*ArcTan[c*x] - 18*b*c*x*ArcTan[c*x] - (9*I)*b*c^2*x^2*ArcTa
n[c*x] + 2*b*c^3*x^3*ArcTan[c*x] + (6*I)*a*Log[x] + 10*b*Log[1 + c^2*x^2] -
 3*b*PolyLog[2, (-I)*c*x] + 3*b*PolyLog[2, I*c*x])
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-2i\,ac^3d^3x^3 - 6\,ac^2d^3x^2 + 6i\,acd^3x + 2\,ad^3 + \left(bc^3d^3x^3 - 3i\,bc^2d^3x^2 - 3\,bcd^3x + i\,bd^3\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-2*I*a*c^3*d^3*x^3 - 6*a*c^2*d^3*x^2 + 6*I*a*c*d^3*x + 2*a*d^
3 + (b*c^3*d^3*x^3 - 3*I*b*c^2*d^3*x^2 - 3*b*c*d^3*x + I*b*d^3)*log(-(c*x +
 I)/(c*x - I)))/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.06, size = 220, normalized size = 1.29

$$\frac{id^3b\ln(cx)\ln(icx+1)}{2}+\frac{id^3b\,\mathrm{dilog}(icx+1)}{2}-\frac{3d^3a\,c^2x^2}{2}+d^3a\ln(cx)-\frac{id^3b\arctan(cx)\,c^3x^3}{3}-\frac{5ib\,d^3\ln\left(c^2x^2+1\right)}{3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))/x,x)
```

```
[Out] 1/2*I*d^3*b*ln(c*x)*ln(1+I*c*x)-1/3*I*d^3*b*arctan(c*x)*c^3*x^3-3/2*d^3*a*c
^2*x^2+d^3*a*ln(c*x)-5/3*I*b*d^3*ln(c^2*x^2+1)+3*I*a*c*d^3*x-3/2*d^3*b*arct
an(c*x)*c^2*x^2+d^3*b*ln(c*x)*arctan(c*x)+3*I*b*c*d^3*x*arctan(c*x)+1/6*I*b
*c^2*d^3*x^2-1/2*I*d^3*b*ln(c*x)*ln(1-I*c*x)-1/3*I*d^3*a*c^3*x^3+3/2*b*c*d^
3*x-1/2*I*d^3*b*dilog(1-I*c*x)+1/2*I*d^3*b*dilog(1+I*c*x)-3/2*b*d^3*arctan(
c*x)
```

maxima [A] time = 0.62, size = 184, normalized size = 1.08

$$-\frac{1}{3}i\,ac^3d^3x^3-\frac{3}{2}\,ac^2d^3x^2+\frac{1}{6}i\,bc^2d^3x^2+3i\,acd^3x+\frac{3}{2}\,bcd^3x-\frac{1}{12}\,(3\,\pi+2i)bd^3\log\left(c^2x^2+1\right)+bd^3\arctan(cx)\log(cx)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] -1/3*I*a*c^3*d^3*x^3 - 3/2*a*c^2*d^3*x^2 + 1/6*I*b*c^2*d^3*x^2 + 3*I*a*c*d^
3*x + 3/2*b*c*d^3*x - 1/12*(3*pi + 2*I)*b*d^3*log(c^2*x^2 + 1) + b*d^3*arct
an(c*x)*log(c*x) + 3/2*I*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d^3 - 1/2
*I*b*d^3*dilog(I*c*x + 1) + 1/2*I*b*d^3*dilog(-I*c*x + 1) + a*d^3*log(x) -
1/12*(4*I*b*c^3*d^3*x^3 + 18*b*c^2*d^3*x^2 + 18*b*d^3)*arctan(c*x)
```

mupad [B] time = 0.83, size = 196, normalized size = 1.15

$$\begin{cases} a\,d^3\,\ln(x) \\ a\,d^3\,\ln(x) - \frac{b\,d^3\,\ln\left(c^2\,x^2+1\right)\,3\mathrm{i}}{2} - \frac{b\,d^3\,\mathrm{Li}_2(1-c\,x\,1\mathrm{i})\,1\mathrm{i}}{2} + \frac{b\,d^3\,\mathrm{Li}_2(1+c\,x\,1\mathrm{i})\,1\mathrm{i}}{2} - \frac{3\,a\,c^2\,d^3\,x^2}{2} - \frac{a\,c^3\,d^3\,x^3\,1\mathrm{i}}{3} + a\,c\,d^3\,x\,3\mathrm{i} + \frac{3\,b\,c\,d^3\,x}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^3)/x,x)
```

```
[Out] piecewise(c == 0, a*d^3*log(x), c ~= 0, - (b*d^3*log(c^2*x^2 + 1)*3i)/2 + a
*d^3*log(x) - (b*d^3*dilog(- c*x*1i + 1)*1i)/2 + (b*d^3*dilog(c*x*1i + 1)*1
i)/2 - (3*a*c^2*d^3*x^2)/2 - (a*c^3*d^3*x^3*1i)/3 + a*c*d^3*x*3i + (3*b*c*d
^3*x)/2 + (b*c^2*d^3*(x^2/2 - log(c^2*x^2 + 1)/(2*c^2))*1i)/3 - 3*b*c^2*d^3
*atan(c*x)*(1/(2*c^2) + x^2/2) - (b*c^3*d^3*x^3*atan(c*x)*1i)/3 + b*c*d^3*x
*atan(c*x)*3i)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-id^3\left(\int(-3ac)\,dx + \int\frac{ia}{x}\,dx + \int ac^3x^2\,dx + \int(-3bc\,\mathrm{atan}\,(cx))\,dx + \int\left(-3iac^2x\right)\,dx + \int\frac{ib\,\mathrm{atan}\,(cx)}{x}\,dx +$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))/x,x)
```

```
[Out] -I*d**3*(Integral(-3*a*c, x) + Integral(I*a/x, x) + Integral(a*c**3*x**2, x
) + Integral(-3*b*c*atan(c*x), x) + Integral(-3*I*a*c**2*x, x) + Integral(I
*b*atan(c*x)/x, x) + Integral(b*c**3*x**2*atan(c*x), x) + Integral(-3*I*b*c
**2*x*atan(c*x), x))
```

3.25 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=162

$$-\frac{1}{2}ic^3d^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}-3ac^2d^3x+3iacd^3\log(x)+bcd^3\log\left(c^2x^2+1\right)+\frac{1}{2}ibc^2d^3x-3bc^2d$$

```
[Out] -3*a*c^2*d^3*x+1/2*I*b*c^2*d^3*x-1/2*I*b*c*d^3*arctan(c*x)-3*b*c^2*d^3*x*ar
ctan(c*x)-d^3*(a+b*arctan(c*x))/x-1/2*I*c^3*d^3*x^2*(a+b*arctan(c*x))+3*I*a
*c*d^3*ln(x)+b*c*d^3*ln(x)+b*c*d^3*ln(c^2*x^2+1)-3/2*b*c*d^3*polylog(2,-I*c
*x)+3/2*b*c*d^3*polylog(2,I*c*x)
```

Rubi [A] time = 0.17, antiderivative size = 162, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4876, 4846, 260, 4852, 266, 36, 29, 31, 4848, 2391, 321, 203}

$$-\frac{3}{2}bcd^3\text{PolyLog}(2,-icx)+\frac{3}{2}bcd^3\text{PolyLog}(2,icx)-\frac{1}{2}ic^3d^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}-3ac^2d^3x+3ia$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -3*a*c^2*d^3*x + (I/2)*b*c^2*d^3*x - (I/2)*b*c*d^3*ArcTan[c*x] - 3*b*c^2*d^
3*x*ArcTan[c*x] - (d^3*(a + b*ArcTan[c*x]))/x - (I/2)*c^3*d^3*x^2*(a + b*Ar
cTan[c*x]) + (3*I)*a*c*d^3*Log[x] + b*c*d^3*Log[x] + b*c*d^3*Log[1 + c^2*x^
2] - (3*b*c*d^3*PolyLog[2, (-I)*c*x])/2 + (3*b*c*d^3*PolyLog[2, I*c*x])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^2}dx = \int\left(-3c^2d^3\left(a+b\tan^{-1}(cx)\right)+\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x^2}+\frac{3icd^3\left(a+b\tan^{-1}(cx\right.}{x}\right.$$
$$= d^3\int\frac{a+b\tan^{-1}(cx)}{x^2}dx+\left(3icd^3\right)\int\frac{a+b\tan^{-1}(cx)}{x}dx-\left(3c^2d^3\right)\int\left(a+b\right.$$
$$= -3ac^2d^3x-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{2}ic^3d^3x^2\left(a+b\tan^{-1}(cx)\right)+3iacd^3\log($$
$$= -3ac^2d^3x+\frac{1}{2}ibc^2d^3x-3bc^2d^3x\tan^{-1}(cx)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{2}ic^3d^3x$$
$$= -3ac^2d^3x+\frac{1}{2}ibc^2d^3x-\frac{1}{2}ibcd^3\tan^{-1}(cx)-3bc^2d^3x\tan^{-1}(cx)-\frac{d^3\left(a+b\,\mathrm{ta}\right.}{x}$$
$$= -3ac^2d^3x+\frac{1}{2}ibc^2d^3x-\frac{1}{2}ibcd^3\tan^{-1}(cx)-3bc^2d^3x\tan^{-1}(cx)-\frac{d^3\left(a+b\,\mathrm{ta}\right.}{x}$$

Mathematica [A] time = 0.13, size = 150, normalized size = 0.93

$$\frac{d^3\left(-iac^3x^3-6ac^2x^2+6iacx\log(x)-2a-ibc^3x^3\tan^{-1}(cx)+ibc^2x^2+2bcx\log\left(c^2x^2+1\right)-6bc^2x^2\tan^{-1}(cx)-\right.}{2x}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] (d^3*(-2*a - 6*a*c^2*x^2 + I*b*c^2*x^2 - I*a*c^3*x^3 - 2*b*ArcTan[c*x] - I*
b*c*x*ArcTan[c*x] - 6*b*c^2*x^2*ArcTan[c*x] - I*b*c^3*x^3*ArcTan[c*x] + (6*
I)*a*c*x*Log[x] + 2*b*c*x*Log[c*x] + 2*b*c*x*Log[1 + c^2*x^2] - 3*b*c*x*Pol
yLog[2, (-I)*c*x] + 3*b*c*x*PolyLog[2, I*c*x]))/(2*x)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-2i\,ac^3d^3x^3-6\,ac^2d^3x^2+6i\,acd^3x+2\,ad^3+\left(bc^3d^3x^3-3i\,bc^2d^3x^2-3\,bcd^3x+i\,bd^3\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-2*I*a*c^3*d^3*x^3 - 6*a*c^2*d^3*x^2 + 6*I*a*c*d^3*x + 2*a*d^
3 + (b*c^3*d^3*x^3 - 3*I*b*c^2*d^3*x^2 - 3*b*c*d^3*x + I*b*d^3)*log(-(c*x +
 I)/(c*x - I)))/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.06, size = 223, normalized size = 1.38

$$-3a\,c^2d^3x+3ic\,d^3a\ln(cx)-\frac{id^3a\,c^3x^2}{2}-\frac{d^3a}{x}-3b\,c^2d^3x\arctan(cx)-\frac{id^3b\arctan(cx)\,c^3x^2}{2}+3ic\,d^3b\arctan(cx)\ln(cx)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] -3*a*c^2*d^3*x+3*I*c*d^3*a*ln(c*x)-1/2*I*d^3*a*c^3*x^2-d^3*a/x-3*b*c^2*d^3*
x*arctan(c*x)-1/2*I*d^3*b*arctan(c*x)*c^3*x^2+3*I*c*d^3*b*arctan(c*x)*ln(c*
x)-d^3*b*arctan(c*x)/x-3/2*c*d^3*b*ln(c*x)*ln(1+I*c*x)+3/2*c*d^3*b*ln(c*x)*
ln(1-I*c*x)-3/2*c*d^3*b*dilog(1+I*c*x)+3/2*c*d^3*b*dilog(1-I*c*x)-1/2*I*b*c
*d^3*arctan(c*x)+c*d^3*b*ln(c*x)+b*c*d^3*ln(c^2*x^2+1)+1/2*I*b*c^2*d^3*x
```

maxima [A] time = 0.61, size = 201, normalized size = 1.24

$$-\frac{1}{2}i\,ac^3d^3x^2-3\,ac^2d^3x+\frac{1}{2}i\,bc^2d^3x-\frac{3}{4}i\,\pi bcd^3\log\left(c^2x^2+1\right)+3i\,bcd^3\arctan\left(cx\right)\log\left(cx\right)-\frac{3}{2}\left(2\,cx\arctan\left(cx\right)-1\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -1/2*I*a*c^3*d^3*x^2 - 3*a*c^2*d^3*x + 1/2*I*b*c^2*d^3*x - 3/4*I*pi*b*c*d^3
*log(c^2*x^2 + 1) + 3*I*b*c*d^3*arctan(c*x)*log(c*x) - 3/2*(2*c*x*arctan(c*
x) - log(c^2*x^2 + 1))*b*c*d^3 + 3/2*b*c*d^3*dilog(I*c*x + 1) - 3/2*b*c*d^3
*dilog(-I*c*x + 1) + 3*I*a*c*d^3*log(x) - 1/2*(c*(log(c^2*x^2 + 1) - log(x^
2)) + 2*arctan(c*x)/x)*b*d^3 - a*d^3/x - 1/4*(2*I*b*c^3*d^3*x^2 + 2*I*b*c*d
^3)*arctan(c*x)
```

mupad [B] time = 0.72, size = 195, normalized size = 1.20

$$\begin{cases} -\frac{a\,d^3}{x} \\ \frac{b\,d^3\left(c^2\,\ln(x)-\frac{c^2\,\ln\left(c^2\,x^2+1\right)}{2}\right)}{c}-\frac{a\,c^3\,d^3\,x^2\,1\mathrm{i}}{2}-\frac{a\,d^3}{x}+\frac{3\,b\,c\,d^3\,(\mathrm{Li}_2(1-c\,x\,1\mathrm{i})-\mathrm{Li}_2(1+c\,x\,1\mathrm{i}))}{2}+\frac{3\,b\,c\,d^3\,\ln\left(c^2\,x^2+1\right)}{2}-3\,a\,c^2\,d^3\,x+\frac{b\,c^2\,d^3}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^3)/x^2,x)
```

```
[Out] piecewise(c == 0, -(a*d^3)/x, c ~= 0, - (a*d^3)/x - (a*c^3*d^3*x^2*1i)/2 +
(b*d^3*(c^2*log(x) - (c^2*log(c^2*x^2 + 1))/2))/c + (3*b*c*d^3*(dilog(- c*x
*1i + 1) - dilog(c*x*1i + 1)))/2 + (3*b*c*d^3*log(c^2*x^2 + 1))/2 - 3*a*c^2
*d^3*x + (b*c^2*d^3*x*1i)/2 + a*c*d^3*log(x)*3i - (b*d^3*atan(c*x))/x - 3*b
*c^2*d^3*x*atan(c*x) - b*c^3*d^3*atan(c*x)*(1/(2*c^2) + x^2/2)*1i)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))/x**2,x)
```

```
[Out] Timed out
```

3.26 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=180

$$-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{x}-iac^3d^3x-3ac^2d^3\log(x)-ibc^3d^3x\tan^{-1}(cx)-\frac{3}{2}ibc^2d^3\text{Li}_2(-icx)+\frac{3}{2}ib$$

```
[Out] -1/2*b*c*d^3/x-I*a*c^3*d^3*x-1/2*b*c^2*d^3*arctan(c*x)-I*b*c^3*d^3*x*arctan
(c*x)-1/2*d^3*(a+b*arctan(c*x))/x^2-3*I*c*d^3*(a+b*arctan(c*x))/x-3*a*c^2*d
^3*ln(x)+3*I*b*c^2*d^3*ln(x)-I*b*c^2*d^3*ln(c^2*x^2+1)-3/2*I*b*c^2*d^3*poly
log(2,-I*c*x)+3/2*I*b*c^2*d^3*polylog(2,I*c*x)
```

Rubi [A] time = 0.18, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4876, 4846, 260, 4852, 325, 203, 266, 36, 29, 31, 4848, 2391}

$$-\frac{3}{2}ibc^2d^3\text{PolyLog}(2,-icx)+\frac{3}{2}ibc^2d^3\text{PolyLog}(2,icx)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{x}-iac^3d^3x-3ac$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -(b*c*d^3)/(2*x) - I*a*c^3*d^3*x - (b*c^2*d^3*ArcTan[c*x])/2 - I*b*c^3*d^3*
x*ArcTan[c*x] - (d^3*(a + b*ArcTan[c*x]))/(2*x^2) - ((3*I)*c*d^3*(a + b*Arc
Tan[c*x]))/x - 3*a*c^2*d^3*Log[x] + (3*I)*b*c^2*d^3*Log[x] - I*b*c^2*d^3*Lo
g[1 + c^2*x^2] - ((3*I)/2)*b*c^2*d^3*PolyLog[2, (-I)*c*x] + ((3*I)/2)*b*c^2
*d^3*PolyLog[2, I*c*x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx = \int\Bigg(-ic^3d^3\left(a+b\tan^{-1}(cx)\right)+\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x^3}+\frac{3icd^3\left(a+b\tan^{-1}(cx\right.}{x^2}$$

$$= d^3\int\frac{a+b\tan^{-1}(cx)}{x^3}\,dx+\left(3icd^3\right)\int\frac{a+b\tan^{-1}(cx)}{x^2}\,dx-\left(3c^2d^3\right)\int\frac{a+b}{}$$

$$= -iac^3d^3x-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{x}-3ac^2d^3\log(x)$$

$$= -\frac{bcd^3}{2x}-iac^3d^3x-ibc^3d^3x\tan^{-1}(cx)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{3icd^3\left(a+b\,\mathrm{t}\right.}{x}$$

$$= -\frac{bcd^3}{2x}-iac^3d^3x-\frac{1}{2}bc^2d^3\tan^{-1}(cx)-ibc^3d^3x\tan^{-1}(cx)-\frac{d^3\left(a+b\tan^{-1}(\right.}{2x^2}$$

$$= -\frac{bcd^3}{2x}-iac^3d^3x-\frac{1}{2}bc^2d^3\tan^{-1}(cx)-ibc^3d^3x\tan^{-1}(cx)-\frac{d^3\left(a+b\tan^{-1}(\right.}{2x^2}$$

Mathematica [A] time = 0.13, size = 164, normalized size = 0.91

$$-\frac{id^3\left(2ac^3x^3-6iac^2x^2\log(x)+6acx-ia+2bc^3x^3\tan^{-1}(cx)+3bc^2x^2\mathrm{Li}_2(-icx)-3bc^2x^2\mathrm{Li}_2(icx)-6bc^2x^2\log(cx\right.}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] ((-1/2*I)*d^3*((-I)*a + 6*a*c*x - I*b*c*x + 2*a*c^3*x^3 - I*b*ArcTan[c*x] +
 6*b*c*x*ArcTan[c*x] - I*b*c^2*x^2*ArcTan[c*x] + 2*b*c^3*x^3*ArcTan[c*x] -
(6*I)*a*c^2*x^2*Log[x] - 6*b*c^2*x^2*Log[c*x] + 2*b*c^2*x^2*Log[1 + c^2*x^2
] + 3*b*c^2*x^2*PolyLog[2, (-I)*c*x] - 3*b*c^2*x^2*PolyLog[2, I*c*x]))/x^2
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{-2i\,ac^3d^3x^3-6\,ac^2d^3x^2+6i\,acd^3x+2\,ad^3+\left(bc^3d^3x^3-3i\,bc^2d^3x^2-3\,bcd^3x+i\,bd^3\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-2*I*a*c^3*d^3*x^3 - 6*a*c^2*d^3*x^2 + 6*I*a*c*d^3*x + 2*a*d^
3 + (b*c^3*d^3*x^3 - 3*I*b*c^2*d^3*x^2 - 3*b*c*d^3*x + I*b*d^3)*log(-(c*x +
 I)/(c*x - I)))/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.06, size = 243, normalized size = 1.35

$$-\frac{3ic^2d^3b\,\mathrm{dilog}\,(icx+1)}{2}-3c^2d^3a\ln(cx)-ia\,c^3d^3x-\frac{d^3a}{2x^2}+3ic^2d^3b\ln(cx)-3c^2d^3b\ln(cx)\arctan(cx)-\frac{3ic^2d^3b\ln(cx}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] -I*a*c^3*d^3*x-3*c^2*d^3*a*ln(c*x)-3/2*I*c^2*d^3*b*dilog(1+I*c*x)-1/2*d^3*a
/x^2+3*I*c^2*d^3*b*ln(c*x)-3*c^2*d^3*b*ln(c*x)*arctan(c*x)-3/2*I*c^2*d^3*b*
ln(c*x)*ln(1+I*c*x)-1/2*d^3*b*arctan(c*x)/x^2+3/2*I*c^2*d^3*b*ln(c*x)*ln(1-
I*c*x)-I*b*c^3*d^3*x*arctan(c*x)-3*I*c*d^3*b*arctan(c*x)/x-3*I*c*d^3*a/x-1/
2*b*c*d^3/x+3/2*I*c^2*d^3*b*dilog(1-I*c*x)-I*b*c^2*d^3*ln(c^2*x^2+1)-1/2*b*
c^2*d^3*arctan(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-i\,ac^3d^3x-\frac{1}{2}i\left(2\,cx\arctan\left(cx\right)-\log\left(c^2x^2+1\right)\right)bc^2d^3-3\,bc^2d^3\int\frac{\arctan\left(cx\right)}{x}\,dx-3\,ac^2d^3\log(x)-\frac{3}{2}i\left(c\left(\log\left(c^2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -I*a*c^3*d^3*x - 1/2*I*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*c^2*d^3 - 3
*b*c^2*d^3*integrate(arctan(c*x)/x, x) - 3*a*c^2*d^3*log(x) - 3/2*I*(c*(log
(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c*d^3 - 1/2*((c*arctan(c*x)
+ 1/x)*c + arctan(c*x)/x^2)*b*d^3 - 3*I*a*c*d^3/x - 1/2*a*d^3/x^2
```

mupad [B] time = 0.73, size = 205, normalized size = 1.14

$$\begin{cases} -\frac{a\,d^3}{2\,x^2} \\ b\,d^3\,\left(c^2\,\ln(x)-\frac{c^2\,\ln\left(c^2\,x^2+1\right)}{2}\right)\,3\mathrm{i}+\frac{b\,c^2\,d^3\,\ln\left(c^2\,x^2+1\right)\,1\mathrm{i}}{2}+\frac{b\,c^2\,d^3\,\mathrm{Li_2}(1-c\,x\,1\mathrm{i})\,3\mathrm{i}}{2}-\frac{b\,c^2\,d^3\,\mathrm{Li_2}(1+c\,x\,1\mathrm{i})\,3\mathrm{i}}{2}-\frac{b\,d^3\,\left(c^3\,\mathrm{atan}(c\,x)+\frac{c^2}{x}\right.}{2\,c} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^3)/x^3,x)
```

```
[Out] piecewise(c == 0, -(a*d^3)/(2*x^2), c ~= 0, b*d^3*(c^2*log(x) - (c^2*log(c^
2*x^2 + 1))/2)*3i + (b*c^2*d^3*log(c^2*x^2 + 1)*1i)/2 + (b*c^2*d^3*dilog(-
c*x*1i + 1)*3i)/2 - (b*c^2*d^3*dilog(c*x*1i + 1)*3i)/2 - (b*d^3*(c^3*atan(c
*x) + c^2/x))/(2*c) - (a*d^3*(c*x*6i + c^3*x^3*2i + 6*c^2*x^2*log(x) + 1))/
(2*x^2) - (b*d^3*atan(c*x))/(2*x^2) - (b*c*d^3*atan(c*x)*3i)/x - b*c^3*d^3*
x*atan(c*x)*1i)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))/x**3,x)
```

```
[Out] Timed out
```

3.27 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=189

$$\frac{3c^2d^3\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}-iac^3d^3\log(x)+\frac{1}{2}bc^3d^3\text{Li}_2(-icx)-\frac{1}{2}bc^3d^3\text{L}$$

```
[Out] -1/6*b*c*d^3/x^2-3/2*I*b*c^2*d^3/x-3/2*I*b*c^3*d^3*arctan(c*x)-1/3*d^3*(a+b
*arctan(c*x))/x^3-3/2*I*c*d^3*(a+b*arctan(c*x))/x^2+3*c^2*d^3*(a+b*arctan(c
*x))/x-I*a*c^3*d^3*ln(x)-10/3*b*c^3*d^3*ln(x)+5/3*b*c^3*d^3*ln(c^2*x^2+1)+1
/2*b*c^3*d^3*polylog(2,-I*c*x)-1/2*b*c^3*d^3*polylog(2,I*c*x)
```

Rubi [A] time = 0.20, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {4876, 4852, 266, 44, 325, 203, 36, 29, 31, 4848, 2391}

$$\frac{1}{2}bc^3d^3\text{PolyLog}(2,-icx)-\frac{1}{2}bc^3d^3\text{PolyLog}(2,icx)+\frac{3c^2d^3\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{d^3\left(a+b\tan\right.}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*d^3)/(6*x^2) - (((3*I)/2)*b*c^2*d^3)/x - ((3*I)/2)*b*c^3*d^3*ArcTan[c
*x] - (d^3*(a + b*ArcTan[c*x]))/(3*x^3) - (((3*I)/2)*c*d^3*(a + b*ArcTan[c*
x]))/x^2 + (3*c^2*d^3*(a + b*ArcTan[c*x]))/x - I*a*c^3*d^3*Log[x] - (10*b*c
^3*d^3*Log[x])/3 + (5*b*c^3*d^3*Log[1 + c^2*x^2])/3 + (b*c^3*d^3*PolyLog[2,
 (-I)*c*x])/2 - (b*c^3*d^3*PolyLog[2, I*c*x])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx = \int\left(\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x^4}+\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{3c^2d^3\left(a+b\tan^{-1}(\right.}{x^2}\right.$$

$$= d^3\int\frac{a+b\tan^{-1}(cx)}{x^4}\,dx+\left(3icd^3\right)\int\frac{a+b\tan^{-1}(cx)}{x^3}\,dx-\left(3c^2d^3\right)\int\frac{a\,-}{}$$

$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{3c^2d^3\left(a+b\tan^{-1}(cx\right.}{x}$$

$$= -\frac{3ibc^2d^3}{2x}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{3c^2d^3\left(a+\right.}{}$$

$$= -\frac{3ibc^2d^3}{2x}-\frac{3}{2}ibc^3d^3\tan^{-1}(cx)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3icd^3\left(a+b\tan^{-1}\right.}{2x^2}$$

$$= -\frac{bcd^3}{6x^2}-\frac{3ibc^2d^3}{2x}-\frac{3}{2}ibc^3d^3\tan^{-1}(cx)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3icd^3\left(a\,-\right.}{}$$

Mathematica [C] time = 0.10, size = 170, normalized size = 0.90

$$\frac{d^3\left(-6iac^3x^3\log(x)+18ac^2x^2-9iacx-2a+3bc^3x^3\text{Li}_2(-icx)-3bc^3x^3\text{Li}_2(icx)-20bc^3x^3\log(x)-9ibc^2x^2\,{}_2F_1\left(-\right.\right.}{6x^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] (d^3*(-2*a - (9*I)*a*c*x - b*c*x + 18*a*c^2*x^2 - 2*b*ArcTan[c*x] - (9*I)*b
*c*x*ArcTan[c*x] + 18*b*c^2*x^2*ArcTan[c*x] - (9*I)*b*c^2*x^2*Hypergeometri
c2F1[-1/2, 1, 1/2, -(c^2*x^2)] - (6*I)*a*c^3*x^3*Log[x] - 20*b*c^3*x^3*Log[
x] + 10*b*c^3*x^3*Log[1 + c^2*x^2] + 3*b*c^3*x^3*PolyLog[2, (-I)*c*x] - 3*b
*c^3*x^3*PolyLog[2, I*c*x]))/(6*x^3)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-2i\,ac^3d^3x^3-6\,ac^2d^3x^2+6i\,acd^3x+2\,ad^3+\left(bc^3d^3x^3-3i\,bc^2d^3x^2-3\,bcd^3x+i\,bd^3\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\,x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-2*I*a*c^3*d^3*x^3 - 6*a*c^2*d^3*x^2 + 6*I*a*c*d^3*x + 2*a*d^
3 + (b*c^3*d^3*x^3 - 3*I*b*c^2*d^3*x^2 - 3*b*c*d^3*x + I*b*d^3)*log(-(c*x +
 I)/(c*x - I)))/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 255, normalized size = 1.35

$$-\frac{d^3a}{3x^3}-ic^3d^3b\arctan(cx)\ln(cx)+\frac{3c^2d^3a}{x}-\frac{3ib\,c^3d^3\arctan(cx)}{2}-\frac{d^3b\arctan(cx)}{3x^3}-\frac{3ic\,d^3a}{2x^2}+\frac{3c^2d^3b\arctan(cx)}{x}-\frac{3ic}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] -1/3*d^3*a/x^3-I*c^3*d^3*b*arctan(c*x)*ln(c*x)+3*c^2*d^3*a/x-3/2*I*b*c^3*d^
3*arctan(c*x)-1/3*d^3*b*arctan(c*x)/x^3-3/2*I*c*d^3*a/x^2+3*c^2*d^3*b*arcta
n(c*x)/x-3/2*I*c*d^3*b*arctan(c*x)/x^2+1/2*c^3*d^3*b*ln(c*x)*ln(1+I*c*x)-1/
2*c^3*d^3*b*ln(c*x)*ln(1-I*c*x)+1/2*c^3*d^3*b*dilog(1+I*c*x)-1/2*c^3*d^3*b*
dilog(1-I*c*x)-I*c^3*d^3*a*ln(c*x)-1/6*b*c*d^3/x^2-10/3*c^3*d^3*b*ln(c*x)+5
/3*b*c^3*d^3*ln(c^2*x^2+1)-3/2*I*b*c^2*d^3/x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-i\,bc^3d^3\int\frac{\arctan(cx)}{x}\,dx-i\,ac^3d^3\log(x)+\frac{3}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bc^2d^3-\frac{3}{2}i\left(\left(c\arctan(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] -I*b*c^3*d^3*integrate(arctan(c*x)/x, x) - I*a*c^3*d^3*log(x) + 3/2*(c*(log
(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c^2*d^3 - 3/2*I*((c*arctan(c
*x) + 1/x)*c + arctan(c*x)/x^2)*b*c*d^3 + 1/6*((c^2*log(c^2*x^2 + 1) - c^2*
log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*d^3 + 3*a*c^2*d^3/x - 3/2*I*a*c*
d^3/x^2 - 1/3*a*d^3/x^3
```

mupad [B] time = 0.97, size = 221, normalized size = 1.17

$$\begin{cases} -\frac{a\,d^3}{3\,x^3} \\ \frac{b\,c^3\,d^3\,\ln\left(-\frac{3\,c^6\,x^2}{2}-\frac{3\,c^4}{2}\right)}{6}-\frac{b\,c^3\,d^3\,\ln(x)}{3}-\frac{b\,c^3\,d^3\,(\mathrm{Li}_2(1-c\,x\,1\mathrm{i})-\mathrm{Li}_2(1+c\,x\,1\mathrm{i}))}{2}-3\,b\,c\,d^3\,\left(c^2\,\ln(x)-\frac{c^2\,\ln\left(c^2\,x^2+1\right)}{2}\right)-\frac{b\,c\,d^3}{6\,x^2}-\frac{a\,d^3}{} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^3)/x^4,x)
```

```
[Out] piecewise(c == 0, -(a*d^3)/(3*x^3), c ~= 0, - (b*d^3*(c^3*atan(c*x) + c^2/x
)*3i)/2 - (b*c^3*d^3*(dilog(- c*x*1i + 1) - dilog(c*x*1i + 1)))/2 - (b*c^3*
d^3*log(x))/3 + (b*c^3*d^3*log(- (3*c^4)/2 - (3*c^6*x^2)/2))/6 - 3*b*c*d^3*
(c^2*log(x) - (c^2*log(c^2*x^2 + 1))/2) - (b*c*d^3)/(6*x^2) - (a*d^3*(c*x*9
i - 18*c^2*x^2 + c^3*x^3*log(x)*6i + 2))/(6*x^3) - (b*d^3*atan(c*x))/(3*x^3
) - (b*c*d^3*atan(c*x)*3i)/(2*x^2) + (3*b*c^2*d^3*atan(c*x))/x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Timed out
```

3.28 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=103

$$-\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4x^4}-2ibc^4d^3\log(x)+2ibc^4d^3\log(cx+i)+\frac{7bc^3d^3}{4x}-\frac{ibc^2d^3}{2x^2}-\frac{bcd^3}{12x^3}$$

```
[Out] -1/12*b*c*d^3/x^3-1/2*I*b*c^2*d^3/x^2+7/4*b*c^3*d^3/x-1/4*d^3*(1+I*c*x)^4*(
a+b*arctan(c*x))/x^4-2*I*b*c^4*d^3*ln(x)+2*I*b*c^4*d^3*ln(I+c*x)
```

Rubi [A] time = 0.09, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {37, 4872, 12, 88}

$$-\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{ibc^2d^3}{2x^2}+\frac{7bc^3d^3}{4x}-2ibc^4d^3\log(x)+2ibc^4d^3\log(cx+i)-\frac{bcd^3}{12x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(b*c*d^3)/(12*x^3) - ((I/2)*b*c^2*d^3)/x^2 + (7*b*c^3*d^3)/(4*x) - (d^3*(1
 + I*c*x)^4*(a + b*ArcTan[c*x]))/(4*x^4) - (2*I)*b*c^4*d^3*Log[x] + (2*I)*b
*c^4*d^3*Log[I + c*x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 88

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x
_))^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*
x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && IntegersQ[m, n] && (Inte
gerQ[p] || (GtQ[m, 0] && GeQ[n, -1]))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx = -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} - (bc)\int \frac{d^3(i-cx)^3}{4x^4(i+cx)}\,dx$$
$$= -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{1}{4}\left(bcd^3\right)\int \frac{(i-cx)^3}{x^4(i+cx)}\,dx$$
$$= -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{1}{4}\left(bcd^3\right)\int \left(-\frac{1}{x^4} - \frac{4ic}{x^3} + \frac{7c^2}{x^2} + \frac{8ic^3}{x}\right.$$
$$= -\frac{bcd^3}{12x^3} - \frac{ibc^2d^3}{2x^2} + \frac{7bc^3d^3}{4x} - \frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} - 2ibc^4d^3\log$$

Mathematica [C] time = 0.13, size = 165, normalized size = 1.60

$$\frac{d^3\left(-bcx\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right) - 3i\left(-4ac^3x^3 + 6iac^2x^2 + 4acx - ia + 8bc^4x^4\log(x) + 2bc^2x^2 - 4bc^4x^4\log\left(c^2\right.\right.\right.}{12x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] (d^3*(-(b*c*x*Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)]) - (3*I)*((-I)*a
 + 4*a*c*x + (6*I)*a*c^2*x^2 + 2*b*c^2*x^2 - 4*a*c^3*x^3 + b*(-I + 4*c*x +
(6*I)*c^2*x^2 - 4*c^3*x^3)*ArcTan[c*x] + (6*I)*b*c^3*x^3*Hypergeometric2F1[
-1/2, 1, 1/2, -(c^2*x^2)] + 8*b*c^4*x^4*Log[x] - 4*b*c^4*x^4*Log[1 + c^2*x^
2])))/(12*x^4)
```

fricas [B] time = 0.49, size = 174, normalized size = 1.69

$$\frac{-48i\,bc^4d^3x^4\log(x) + 45i\,bc^4d^3x^4\log\left(\frac{cx+i}{c}\right) + 3i\,bc^4d^3x^4\log\left(\frac{cx-i}{c}\right) + (24i\,a + 42\,b)c^3d^3x^3 + 12\,(3\,a - i\,b)c^2d^3x}{24\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] 1/24*(-48*I*b*c^4*d^3*x^4*log(x) + 45*I*b*c^4*d^3*x^4*log((c*x + I)/c) + 3*
I*b*c^4*d^3*x^4*log((c*x - I)/c) + (24*I*a + 42*b)*c^3*d^3*x^3 + 12*(3*a -
I*b)*c^2*d^3*x^2 + (-24*I*a - 2*b)*c*d^3*x - 6*a*d^3 - (12*b*c^3*d^3*x^3 -
18*I*b*c^2*d^3*x^2 - 12*b*c*d^3*x + 3*I*b*d^3)*log(-(c*x + I)/(c*x - I)))/x
^4
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.04, size = 190, normalized size = 1.84

$$-\frac{ic\,d^3a}{x^3}+\frac{ic^3d^3a}{x}-\frac{d^3a}{4x^4}+\frac{3c^2d^3a}{2x^2}-\frac{ic\,d^3b\arctan(cx)}{x^3}+\frac{ic^3d^3b\arctan(cx)}{x}-\frac{d^3b\arctan(cx)}{4x^4}+\frac{3c^2d^3b\arctan(cx)}{2x^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] -I*c*d^3*a/x^3+I*c^3*d^3*a/x-1/4*d^3*a/x^4+3/2*c^2*d^3*a/x^2-I*c*d^3*b*arct
an(c*x)/x^3+I*c^3*d^3*b*arctan(c*x)/x-1/4*d^3*b*arctan(c*x)/x^4+3/2*c^2*d^3
*b*arctan(c*x)/x^2-1/2*I*b*c^2*d^3/x^2-2*I*c^4*d^3*b*ln(c*x)-1/12*b*c*d^3/x
^3+7/4*b*c^3*d^3/x+I*c^4*d^3*b*ln(c^2*x^2+1)+7/4*b*c^4*d^3*arctan(c*x)
```

maxima [B] time = 0.42, size = 202, normalized size = 1.96

$$\frac{1}{2}i\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bc^3d^3+\frac{3}{2}\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bc^2d^3+\frac{1}{2}i\left(\left(c^2\log\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] 1/2*I*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c^3*d^3 + 3/2*(
(c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*c^2*d^3 + 1/2*I*((c^2*log(c^2*
x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*c*d^3 + I*a*c^3*d
^3/x + 1/12*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^
4)*b*d^3 + 3/2*a*c^2*d^3/x^2 - I*a*c*d^3/x^3 - 1/4*a*d^3/x^4
```

mupad [B] time = 0.66, size = 154, normalized size = 1.50

$$-\frac{\frac{d^3\,(3\,a+3\,b\,\mathrm{atan}(c\,x))}{12}+\frac{d^3\,x\,(a\,c\,12\mathrm{i}+b\,c+b\,c\,\mathrm{atan}(c\,x)\,12\mathrm{i})}{12}-\frac{d^3\,x^2\,\left(18\,a\,c^2+18\,b\,c^2\,\mathrm{atan}(c\,x)-b\,c^2\,6\mathrm{i}\right)}{12}-\frac{d^3\,x^3\,\left(a\,c^3\,12\mathrm{i}+21\,b\,c^3+b\,c^3\,\mathrm{atan}(c\,x)\,12\mathrm{i}\right)}{12}}{x^4}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^3)/x^5,x)
```

```
[Out] (d^3*(21*b*c^4*atan(c*x) + b*c^4*log(c^2*x^2 + 1)*12i - b*c^4*log(x)*24i))/
12 - ((d^3*(3*a + 3*b*atan(c*x)))/12 + (d^3*x*(a*c*12i + b*c + b*c*atan(c*x
)*12i))/12 - (d^3*x^2*(18*a*c^2 - b*c^2*6i + 18*b*c^2*atan(c*x)))/12 - (d^3
*x^3*(a*c^3*12i + 21*b*c^3 + b*c^3*atan(c*x)*12i))/12)/x^4
```

sympy [B] time = 26.55, size = 311, normalized size = 3.02

$$-2ibc^4d^3\log\left(3689b^2c^9d^6x\right)+\frac{ibc^4d^3\log\left(3689b^2c^9d^6x-3689ib^2c^8d^6\right)}{8}+\frac{15ibc^4d^3\log\left(3689b^2c^9d^6x+3689ib^2c^8d^6\right.}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))/x**5,x)
```

```
[Out] -2*I*b*c**4*d**3*log(3689*b**2*c**9*d**6*x) + I*b*c**4*d**3*log(3689*b**2*c
**9*d**6*x - 3689*I*b**2*c**8*d**6)/8 + 15*I*b*c**4*d**3*log(3689*b**2*c**9
*d**6*x + 3689*I*b**2*c**8*d**6)/8 - (3*a*d**3 + x**3*(-12*I*a*c**3*d**3 -
21*b*c**3*d**3) + x**2*(-18*a*c**2*d**3 + 6*I*b*c**2*d**3) + x*(12*I*a*c*d*
*3 + b*c*d**3))/(12*x**4) + (-4*b*c**3*d**3*x**3 + 6*I*b*c**2*d**3*x**2 + 4
*b*c*d**3*x - I*b*d**3)*log(-I*c*x + 1)/(8*x**4) + (4*b*c**3*d**3*x**3 - 6*
I*b*c**2*d**3*x**2 - 4*b*c*d**3*x + I*b*d**3)*log(I*c*x + 1)/(8*x**4)
```

3.29 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx$

Optimal. Leaf size=150

$$-\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{icd^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{20x^4}+\frac{6}{5}bc^5d^3\log(x)-\frac{6}{5}bc^5d^3\log(cx+i)+\frac{5ibc^4d^3}{4x}+$$

```
[Out] -1/20*b*c*d^3/x^4-1/4*I*b*c^2*d^3/x^3+3/5*b*c^3*d^3/x^2+5/4*I*b*c^4*d^3/x-1
/5*d^3*(1+I*c*x)^4*(a+b*arctan(c*x))/x^5+1/20*I*c*d^3*(1+I*c*x)^4*(a+b*arct
an(c*x))/x^4+6/5*b*c^5*d^3*ln(x)-6/5*b*c^5*d^3*ln(I+c*x)
```

Rubi [A] time = 0.11, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {45, 37, 4872, 12, 148}

$$\frac{icd^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{20x^4}-\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{3bc^3d^3}{5x^2}-\frac{ibc^2d^3}{4x^3}+\frac{5ibc^4d^3}{4x}+\frac{6}{5}bc^5d^3\log(x)-\frac{6}{5}bc$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -(b*c*d^3)/(20*x^4) - ((I/4)*b*c^2*d^3)/x^3 + (3*b*c^3*d^3)/(5*x^2) + (((5*
I)/4)*b*c^4*d^3)/x - (d^3*(1 + I*c*x)^4*(a + b*ArcTan[c*x]))/(5*x^5) + ((I/
20)*c*d^3*(1 + I*c*x)^4*(a + b*ArcTan[c*x]))/x^4 + (6*b*c^5*d^3*Log[x])/5 -
 (6*b*c^5*d^3*Log[I + c*x])/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 148

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_)
)^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(
c + d*x)^n*(e + f*x)^p*(g + h*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h,
m}, x] && (IntegersQ[m, n, p] || (IGtQ[n, 0] && IGtQ[p, 0]))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
```

```
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\begin{aligned}\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx &= -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{icd^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{20x^4}-(bc)\int\\ &= -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{icd^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{20x^4}-\frac{1}{20}\left(bc\right.\\ &= -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{icd^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{20x^4}-\frac{1}{20}\left(bc\right.\\ &= -\frac{bcd^3}{20x^4}-\frac{ibc^2d^3}{4x^3}+\frac{3bc^3d^3}{5x^2}+\frac{5ibc^4d^3}{4x}-\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{icd}{}\end{aligned}$$

Mathematica [C] time = 0.11, size = 185, normalized size = 1.23

$$\frac{d^3\left(10iac^3x^3+20ac^2x^2-15iacx-4a+24bc^5x^5\log(x)+12bc^3x^3+10ibc^3x^3\tan^{-1}(cx)-5ibc^2x^2\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] (d^3*(-4*a - (15*I)*a*c*x - b*c*x + 20*a*c^2*x^2 + (10*I)*a*c^3*x^3 + 12*b*
c^3*x^3 - 4*b*ArcTan[c*x] - (15*I)*b*c*x*ArcTan[c*x] + 20*b*c^2*x^2*ArcTan[
c*x] + (10*I)*b*c^3*x^3*ArcTan[c*x] - (5*I)*b*c^2*x^2*Hypergeometric2F1[-3/
2, 1, -1/2, -(c^2*x^2)] + (10*I)*b*c^4*x^4*Hypergeometric2F1[-1/2, 1, 1/2,
-(c^2*x^2)] + 24*b*c^5*x^5*Log[x] - 12*b*c^5*x^5*Log[1 + c^2*x^2]))/(20*x^5
)
```

fricas [A] time = 0.53, size = 185, normalized size = 1.23

$$\frac{48\,bc^5d^3x^5\log(x)-49\,bc^5d^3x^5\log\left(\frac{cx+i}{c}\right)+bc^5d^3x^5\log\left(\frac{cx-i}{c}\right)+50i\,bc^4d^3x^4+(20i\,a+24\,b)c^3d^3x^3+10\,(4\,a-i\,b}{40\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] 1/40*(48*b*c^5*d^3*x^5*log(x) - 49*b*c^5*d^3*x^5*log((c*x + I)/c) + b*c^5*d
^3*x^5*log((c*x - I)/c) + 50*I*b*c^4*d^3*x^4 + (20*I*a + 24*b)*c^3*d^3*x^3
+ 10*(4*a - I*b)*c^2*d^3*x^2 + (-30*I*a - 2*b)*c*d^3*x - 8*a*d^3 - (10*b*c^
3*d^3*x^3 - 20*I*b*c^2*d^3*x^2 - 15*b*c*d^3*x + 4*I*b*d^3)*log(-(c*x + I)/(
c*x - I)))/x^5
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.06, size = 200, normalized size = 1.33

$$\frac{c^2d^3a}{x^3}-\frac{3icd^3a}{4x^4}-\frac{d^3a}{5x^5}+\frac{ic^3d^3a}{2x^2}+\frac{c^2d^3b\arctan(cx)}{x^3}-\frac{3icd^3b\arctan(cx)}{4x^4}-\frac{d^3b\arctan(cx)}{5x^5}+\frac{ic^3d^3b\arctan(cx)}{2x^2}-\frac{ib\,c}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^6,x)
```

```
[Out] c^2*d^3*a/x^3-3/4*I*c*d^3*a/x^4-1/5*d^3*a/x^5+1/2*I*c^3*d^3*a/x^2+c^2*d^3*b
*arctan(c*x)/x^3-3/4*I*c*d^3*b*arctan(c*x)/x^4-1/5*d^3*b*arctan(c*x)/x^5+1/
2*I*c^3*d^3*b*arctan(c*x)/x^2-1/4*I*b*c^2*d^3/x^3+5/4*I*b*c^4*d^3/x-1/20*b*
c*d^3/x^4+3/5*b*c^3*d^3/x^2+6/5*c^5*d^3*b*ln(c*x)-3/5*c^5*d^3*b*ln(c^2*x^2+
1)+5/4*I*c^5*d^3*b*arctan(c*x)
```

maxima [A] time = 0.42, size = 224, normalized size = 1.49

$$\frac{1}{2}i\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bc^3d^3-\frac{1}{2}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bc^2c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] 1/2*I*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*c^3*d^3 - 1/2*((c^2*log
(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*c^2*d^3 + 1/
4*I*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*c*d
^3 - 1/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*
c + 4*arctan(c*x)/x^5)*b*d^3 + 1/2*I*a*c^3*d^3/x^2 + a*c^2*d^3/x^3 - 3/4*I*
a*c*d^3/x^4 - 1/5*a*d^3/x^5
```

mupad [B] time = 0.95, size = 174, normalized size = 1.16

$$\frac{d^3\left(24\,b\,c^5\,\ln(x)-12\,b\,c^5\,\ln\left(c^2\,x^2+1\right)+b\,c^4\,\mathrm{atan}\left(x\,\sqrt{c^2}\right)\,\sqrt{c^2}\,25\mathrm{i}\right)}{20}+\frac{-\frac{d^3\,(4\,a+4\,b\,\mathrm{atan}(c\,x))}{20}-\frac{d^3\,x\,(a\,c\,15\mathrm{i}+b\,c+b\,c\,\mathrm{ata}}{20}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^3)/x^6,x)
```

```
[Out] (d^3*(24*b*c^5*log(x) - 12*b*c^5*log(c^2*x^2 + 1) + b*c^4*atan(x*(c^2)^(1/2
))*(c^2)^(1/2)*25i))/20 + ((d^3*x^3*(a*c^3*10i + 12*b*c^3 + b*c^3*atan(c*x)
*10i))/20 - (d^3*x*(a*c*15i + b*c + b*c*atan(c*x)*15i))/20 - (d^3*(4*a + 4*
b*atan(c*x)))/20 + (d^3*x^2*(20*a*c^2 - b*c^2*5i + 20*b*c^2*atan(c*x)))/20
+ (b*c^4*d^3*x^4*5i)/4)/x^5
```

sympy [B] time = 48.02, size = 326, normalized size = 2.17

$$\frac{6bc^5d^3\log\left(113975b^2c^{11}d^6x\right)}{5}+\frac{bc^5d^3\log\left(113975b^2c^{11}d^6x-113975ib^2c^{10}d^6\right)}{40}-\frac{49bc^5d^3\log\left(113975b^2c^{11}d^6x+\right.}{40}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))/x**6,x)
```

```
[Out] 6*b*c**5*d**3*log(113975*b**2*c**11*d**6*x)/5 + b*c**5*d**3*log(113975*b**2
*c**11*d**6*x - 113975*I*b**2*c**10*d**6)/40 - 49*b*c**5*d**3*log(113975*b*
*2*c**11*d**6*x + 113975*I*b**2*c**10*d**6)/40 + (-10*b*c**3*d**3*x**3 + 20
*I*b*c**2*d**3*x**2 + 15*b*c*d**3*x - 4*I*b*d**3)*log(-I*c*x + 1)/(40*x**5)
 + (10*b*c**3*d**3*x**3 - 20*I*b*c**2*d**3*x**2 - 15*b*c*d**3*x + 4*I*b*d**
3)*log(I*c*x + 1)/(40*x**5) - (4*a*d**3 - 25*I*b*c**4*d**3*x**4 + x**3*(-10
*I*a*c**3*d**3 - 12*b*c**3*d**3) + x**2*(-20*a*c**2*d**3 + 5*I*b*c**2*d**3)
 + x*(15*I*a*c*d**3 + b*c*d**3))/(20*x**5)
```

3.30 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)}{x^7}\,dx$

Optimal. Leaf size=214

$$\frac{ic^3d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{6x^6}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{14}{15}ibc^6d^3\log(x)-$$

```
[Out] -1/30*b*c*d^3/x^5-3/20*I*b*c^2*d^3/x^4+11/36*b*c^3*d^3/x^3+7/15*I*b*c^4*d^3
/x^2-11/12*b*c^5*d^3/x-1/6*d^3*(a+b*arctan(c*x))/x^6-3/5*I*c*d^3*(a+b*arcta
n(c*x))/x^5+3/4*c^2*d^3*(a+b*arctan(c*x))/x^4+1/3*I*c^3*d^3*(a+b*arctan(c*x
))/x^3+14/15*I*b*c^6*d^3*ln(x)-1/120*I*b*c^6*d^3*ln(I-c*x)-37/40*I*b*c^6*d^
3*ln(I+c*x)
```

Rubi [A] time = 0.18, antiderivative size = 214, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {43, 4872, 12, 1802}

$$\frac{ic^3d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{3c^2d^3\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{6x^6}+\frac{7ibc^4d^3}{15x^2}+\frac{11bc^3d}{36x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -(b*c*d^3)/(30*x^5) - (((3*I)/20)*b*c^2*d^3)/x^4 + (11*b*c^3*d^3)/(36*x^3)
+ (((7*I)/15)*b*c^4*d^3)/x^2 - (11*b*c^5*d^3)/(12*x) - (d^3*(a + b*ArcTan[c
*x]))/(6*x^6) - (((3*I)/5)*c*d^3*(a + b*ArcTan[c*x]))/x^5 + (3*c^2*d^3*(a +
 b*ArcTan[c*x]))/(4*x^4) + ((I/3)*c^3*d^3*(a + b*ArcTan[c*x]))/x^3 + ((14*I
)/15)*b*c^6*d^3*Log[x] - (I/120)*b*c^6*d^3*Log[I - c*x] - ((37*I)/40)*b*c^6
*d^3*Log[I + c*x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)}{x^7}\,dx = -\frac{d^3 \left(a+b\tan^{-1}(cx)\right)}{6x^6} - \frac{3icd^3 \left(a+b\tan^{-1}(cx)\right)}{5x^5} + \frac{3c^2d^3 \left(a+b\tan^{-1}(cx\right.}{4x^4}$$

$$= -\frac{d^3 \left(a+b\tan^{-1}(cx)\right)}{6x^6} - \frac{3icd^3 \left(a+b\tan^{-1}(cx)\right)}{5x^5} + \frac{3c^2d^3 \left(a+b\tan^{-1}(cx\right.}{4x^4}$$

$$= -\frac{d^3 \left(a+b\tan^{-1}(cx)\right)}{6x^6} - \frac{3icd^3 \left(a+b\tan^{-1}(cx)\right)}{5x^5} + \frac{3c^2d^3 \left(a+b\tan^{-1}(cx\right.}{4x^4}$$

$$= -\frac{bcd^3}{30x^5} - \frac{3ibc^2d^3}{20x^4} + \frac{11bc^3d^3}{36x^3} + \frac{7ibc^4d^3}{15x^2} - \frac{11bc^5d^3}{12x} - \frac{d^3 \left(a+b\tan^{-1}(cx)\right)}{6x^6}$$

Mathematica [C] time = 0.12, size = 188, normalized size = 0.88

$$\frac{d^3 \left(-2bcx\,{}_2F_1\left(-\frac{5}{2},1;-\frac{3}{2};-c^2x^2\right) + i\left(20ac^3x^3 - 45iac^2x^2 - 36acx + 10ia + 56bc^6x^6\log(x) + 28bc^4x^4 + 20bc^3x\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] (d^3*(-2*b*c*x*Hypergeometric2F1[-5/2, 1, -3/2, -(c^2*x^2)] + I*((10*I)*a -
 36*a*c*x - (45*I)*a*c^2*x^2 - 9*b*c^2*x^2 + 20*a*c^3*x^3 + 28*b*c^4*x^4 +
(10*I)*b*ArcTan[c*x] - 36*b*c*x*ArcTan[c*x] - (45*I)*b*c^2*x^2*ArcTan[c*x]
+ 20*b*c^3*x^3*ArcTan[c*x] - (15*I)*b*c^3*x^3*Hypergeometric2F1[-3/2, 1, -1
/2, -(c^2*x^2)] + 56*b*c^6*x^6*Log[x] - 28*b*c^6*x^6*Log[1 + c^2*x^2])))/(6
0*x^6)
```

fricas [A] time = 0.55, size = 198, normalized size = 0.93

$$\frac{336i\,bc^6d^3x^6\log(x) - 333i\,bc^6d^3x^6\log\left(\frac{cx+i}{c}\right) - 3i\,bc^6d^3x^6\log\left(\frac{cx-i}{c}\right) - 330\,bc^5d^3x^5 + 168i\,bc^4d^3x^4 + (120i\,a +}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^7,x, algorithm="fricas")
```

```
[Out] 1/360*(336*I*b*c^6*d^3*x^6*log(x) - 333*I*b*c^6*d^3*x^6*log((c*x + I)/c) -
3*I*b*c^6*d^3*x^6*log((c*x - I)/c) - 330*b*c^5*d^3*x^5 + 168*I*b*c^4*d^3*x^
4 + (120*I*a + 110*b)*c^3*d^3*x^3 + 54*(5*a - I*b)*c^2*d^3*x^2 + (-216*I*a
- 12*b)*c*d^3*x - 60*a*d^3 - (60*b*c^3*d^3*x^3 - 135*I*b*c^2*d^3*x^2 - 108*
b*c*d^3*x + 30*I*b*d^3)*log(-(c*x + I)/(c*x - I)))/x^6
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^7,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 215, normalized size = 1.00

$$-\frac{7ic^6d^3b\ln\left(c^2x^2+1\right)}{15} + \frac{3c^2d^3a}{4x^4} - \frac{3ic\,d^3b\arctan(cx)}{5x^5} - \frac{d^3a}{6x^6} + \frac{ic^3d^3b\arctan(cx)}{3x^3} + \frac{3c^2d^3b\arctan(cx)}{4x^4} + \frac{ic^3d^3a}{3x^3} - \frac{d^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^7,x)
```

```
[Out] -7/15*I*c^6*d^3*b*ln(c^2*x^2+1)+3/4*c^2*d^3*a/x^4-3/5*I*c*d^3*b*arctan(c*x)
/x^5-1/6*d^3*a/x^6+1/3*I*c^3*d^3*b*arctan(c*x)/x^3+3/4*c^2*d^3*b*arctan(c*x
)/x^4+1/3*I*c^3*d^3*a/x^3-1/6*d^3*b*arctan(c*x)/x^6-3/20*I*b*c^2*d^3/x^4+14
/15*I*c^6*d^3*b*ln(c*x)+7/15*I*b*c^4*d^3/x^2-1/30*b*c*d^3/x^5+11/36*b*c^3*d
^3/x^3-11/12*b*c^5*d^3/x-3/5*I*c*d^3*a/x^5-11/12*b*c^6*d^3*arctan(c*x)
```

maxima [A] time = 0.41, size = 248, normalized size = 1.16

$$-\frac{1}{6}i\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bc^3d^3-\frac{1}{4}\left(\left(3c^3\arctan(cx)+\frac{3c^2x^2-1}{x^3}\right)c-\frac{3\ \text{arcta}}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))/x^7,x, algorithm="maxima")
```

```
[Out] -1/6*I*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3
)*b*c^3*d^3 - 1/4*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c
*x)/x^4)*b*c^2*d^3 - 3/20*I*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*
c^2*x^2 - 1)/x^4)*c + 4*arctan(c*x)/x^5)*b*c*d^3 - 1/90*((15*c^5*arctan(c*x
) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arctan(c*x)/x^6)*b*d^3 + 1/3*I
*a*c^3*d^3/x^3 + 3/4*a*c^2*d^3/x^4 - 3/5*I*a*c*d^3/x^5 - 1/6*a*d^3/x^6
```

mupad [B] time = 1.06, size = 192, normalized size = 0.90

$$-\frac{\frac{d^3\,(30\,a+30\,b\,\text{atan}(c\,x))}{180}+\frac{d^3\,x\,(a\,c\,108\text{i}+6\,b\,c+b\,c\,\text{atan}(c\,x)\,108\text{i})}{180}-\frac{d^3\,x^3\,\left(a\,c^3\,60\text{i}+55\,b\,c^3+b\,c^3\,\text{atan}(c\,x)\,60\text{i}\right)}{180}-\frac{d^3\,x^2\,\left(135\,a\,c^2+135\,b\,c^2\,\text{atan}(c\,x)-\right.}{180}}{x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^3)/x^7,x)
```

```
[Out] - ((d^3*(30*a + 30*b*atan(c*x)))/180 + (d^3*x*(a*c*108i + 6*b*c + b*c*atan(
c*x)*108i))/180 - (d^3*x^3*(a*c^3*60i + 55*b*c^3 + b*c^3*atan(c*x)*60i))/18
0 - (d^3*x^2*(135*a*c^2 - b*c^2*27i + 135*b*c^2*atan(c*x)))/180 - (b*c^4*d^
3*x^4*7i)/15 + (11*b*c^5*d^3*x^5)/12)/x^6 - (d^3*(b*c^6*log(c^2*x^2 + 1)*84
i - b*c^6*log(x)*168i + (165*b*c^9*atan((c^2*x)/(c^2)^(1/2)))/(c^2)^(3/2)))
/180
```

sympy [A] time = 84.08, size = 347, normalized size = 1.62

$$\frac{14ibc^6d^3\log\left(1385945b^2c^{13}d^6x\right)}{15}-\frac{ibc^6d^3\log\left(1385945b^2c^{13}d^6x-1385945ib^2c^{12}d^6\right)}{120}-\frac{37ibc^6d^3\log\left(1385945b^2c^{13}\right.}{40}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))/x**7,x)
```

```
[Out] 14*I*b*c**6*d**3*log(1385945*b**2*c**13*d**6*x)/15 - I*b*c**6*d**3*log(1385
945*b**2*c**13*d**6*x - 1385945*I*b**2*c**12*d**6)/120 - 37*I*b*c**6*d**3*l
og(1385945*b**2*c**13*d**6*x + 1385945*I*b**2*c**12*d**6)/40 + (-20*b*c**3*
d**3*x**3 + 45*I*b*c**2*d**3*x**2 + 36*b*c*d**3*x - 10*I*b*d**3)*log(-I*c*x
 + 1)/(120*x**6) + (20*b*c**3*d**3*x**3 - 45*I*b*c**2*d**3*x**2 - 36*b*c*d*
*3*x + 10*I*b*d**3)*log(I*c*x + 1)/(120*x**6) - (30*a*d**3 + 165*b*c**5*d**
3*x**5 - 84*I*b*c**4*d**3*x**4 + x**3*(-60*I*a*c**3*d**3 - 55*b*c**3*d**3)
+ x**2*(-135*a*c**2*d**3 + 27*I*b*c**2*d**3) + x*(108*I*a*c*d**3 + 6*b*c*d*
*3))/(180*x**6)
```

3.31 $\int x^3(d + icdx)^4 \left(a + b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=238

$$\frac{1}{8}c^4d^4x^8\left(a + b\tan^{-1}(cx)\right) - \frac{4}{7}ic^3d^4x^7\left(a + b\tan^{-1}(cx)\right) - c^2d^4x^6\left(a + b\tan^{-1}(cx)\right) + \frac{4}{5}icd^4x^5\left(a + b\tan^{-1}(cx)\right) + \frac{1}{4}$$

```
[Out] 11/8*b*d^4*x/c^3+24/35*I*b*d^4*x^2/c^2-11/24*b*d^4*x^3/c-12/35*I*b*d^4*x^4+
9/40*b*c*d^4*x^5+2/21*I*b*c^2*d^4*x^6-1/56*b*c^3*d^4*x^7-11/8*b*d^4*arctan(
c*x)/c^4+1/4*d^4*x^4*(a+b*arctan(c*x))+4/5*I*c*d^4*x^5*(a+b*arctan(c*x))-c^
2*d^4*x^6*(a+b*arctan(c*x))-4/7*I*c^3*d^4*x^7*(a+b*arctan(c*x))+1/8*c^4*d^4
*x^8*(a+b*arctan(c*x))-24/35*I*b*d^4*ln(c^2*x^2+1)/c^4
```

Rubi [A] time = 0.21, antiderivative size = 238, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {43, 4872, 12, 1802, 635, 203, 260}

$$\frac{1}{8}c^4d^4x^8\left(a + b\tan^{-1}(cx)\right) - \frac{4}{7}ic^3d^4x^7\left(a + b\tan^{-1}(cx)\right) - c^2d^4x^6\left(a + b\tan^{-1}(cx)\right) + \frac{4}{5}icd^4x^5\left(a + b\tan^{-1}(cx)\right) + \frac{1}{4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] (11*b*d^4*x)/(8*c^3) + (((24*I)/35)*b*d^4*x^2)/c^2 - (11*b*d^4*x^3)/(24*c)
- ((12*I)/35)*b*d^4*x^4 + (9*b*c*d^4*x^5)/40 + ((2*I)/21)*b*c^2*d^4*x^6 - (
b*c^3*d^4*x^7)/56 - (11*b*d^4*ArcTan[c*x])/(8*c^4) + (d^4*x^4*(a + b*ArcTan
[c*x]))/4 + ((4*I)/5)*c*d^4*x^5*(a + b*ArcTan[c*x]) - c^2*d^4*x^6*(a + b*Ar
cTan[c*x]) - ((4*I)/7)*c^3*d^4*x^7*(a + b*ArcTan[c*x]) + (c^4*d^4*x^8*(a +
b*ArcTan[c*x]))/8 - (((24*I)/35)*b*d^4*Log[1 + c^2*x^2])/c^4
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^3(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)dx = \frac{1}{4}d^4x^4\left(a+b\tan^{-1}(cx)\right)+\frac{4}{5}icd^4x^5\left(a+b\tan^{-1}(cx)\right)-c^2d^4x^6\left(a+b\tan^{-}\right.$$

$$= \frac{1}{4}d^4x^4\left(a+b\tan^{-1}(cx)\right)+\frac{4}{5}icd^4x^5\left(a+b\tan^{-1}(cx)\right)-c^2d^4x^6\left(a+b\tan^{-}\right.$$

$$= \frac{1}{4}d^4x^4\left(a+b\tan^{-1}(cx)\right)+\frac{4}{5}icd^4x^5\left(a+b\tan^{-1}(cx)\right)-c^2d^4x^6\left(a+b\tan^{-}\right.$$

$$= \frac{11bd^4x}{8c^3}+\frac{24ibd^4x^2}{35c^2}-\frac{11bd^4x^3}{24c}-\frac{12}{35}ibd^4x^4+\frac{9}{40}bcd^4x^5+\frac{2}{21}ibc^2d^4x^6-$$

$$= \frac{11bd^4x}{8c^3}+\frac{24ibd^4x^2}{35c^2}-\frac{11bd^4x^3}{24c}-\frac{12}{35}ibd^4x^4+\frac{9}{40}bcd^4x^5+\frac{2}{21}ibc^2d^4x^6-$$

$$= \frac{11bd^4x}{8c^3}+\frac{24ibd^4x^2}{35c^2}-\frac{11bd^4x^3}{24c}-\frac{12}{35}ibd^4x^4+\frac{9}{40}bcd^4x^5+\frac{2}{21}ibc^2d^4x^6-$$

Mathematica [A] time = 0.17, size = 290, normalized size = 1.22

$$\frac{1}{8}ac^4d^4x^8-\frac{4}{7}iac^3d^4x^7-ac^2d^4x^6+\frac{4}{5}iacd^4x^5+\frac{1}{4}ad^4x^4+\frac{1}{8}bc^4d^4x^8\tan^{-1}(cx)-\frac{11bd^4\tan^{-1}(cx)}{8c^4}-\frac{1}{56}bc^3d^4x^7-\frac{4}{7}ibc^3d^4x^7$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] (11*b*d^4*x)/(8*c^3) + (((24*I)/35)*b*d^4*x^2)/c^2 - (11*b*d^4*x^3)/(24*c)
+ (a*d^4*x^4)/4 - ((12*I)/35)*b*d^4*x^4 + ((4*I)/5)*a*c*d^4*x^5 + (9*b*c*d^
4*x^5)/40 - a*c^2*d^4*x^6 + ((2*I)/21)*b*c^2*d^4*x^6 - ((4*I)/7)*a*c^3*d^4*
x^7 - (b*c^3*d^4*x^7)/56 + (a*c^4*d^4*x^8)/8 - (11*b*d^4*ArcTan[c*x])/(8*c^
4) + (b*d^4*x^4*ArcTan[c*x])/4 + ((4*I)/5)*b*c*d^4*x^5*ArcTan[c*x] - b*c^2*
d^4*x^6*ArcTan[c*x] - ((4*I)/7)*b*c^3*d^4*x^7*ArcTan[c*x] + (b*c^4*d^4*x^8*
ArcTan[c*x])/8 - (((24*I)/35)*b*d^4*Log[1 + c^2*x^2])/c^4
```

fricas [A] time = 0.50, size = 229, normalized size = 0.96

$$210\,ac^8d^4x^8+(-960i\,a-30\,b)c^7d^4x^7-80\,(21\,a-2i\,b)c^6d^4x^6+(1344i\,a+378\,b)c^5d^4x^5+12\,(35\,a-48i\,b)c^4d^4x^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/1680*(210*a*c^8*d^4*x^8 + (-960*I*a - 30*b)*c^7*d^4*x^7 - 80*(21*a - 2*I*
b)*c^6*d^4*x^6 + (1344*I*a + 378*b)*c^5*d^4*x^5 + 12*(35*a - 48*I*b)*c^4*d^
4*x^4 - 770*b*c^3*d^4*x^3 + 1152*I*b*c^2*d^4*x^2 + 2310*b*c*d^4*x - 2307*I*
b*d^4*log((c*x + I)/c) + 3*I*b*d^4*log((c*x - I)/c) + (105*I*b*c^8*d^4*x^8
+ 480*b*c^7*d^4*x^7 - 840*I*b*c^6*d^4*x^6 - 672*b*c^5*d^4*x^5 + 210*I*b*c^4
*d^4*x^4)*log(-(c*x + I)/(c*x - I)))/c^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 249, normalized size = 1.05

$$\frac{c^4 d^4 a\,x^8}{8}-\frac{4 i c^3 d^4 b \arctan(cx)\,x^7}{7}-c^2 d^4 a\,x^6+\frac{4 i c\,d^4 b \arctan(cx)\,x^5}{5}+\frac{d^4 a\,x^4}{4}+\frac{c^4 d^4 b \arctan(cx)\,x^8}{8}+\frac{24 i b\,d^4 x^2}{35 c^2}-c^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x)
```

```
[Out] 1/8*c^4*d^4*a*x^8-4/7*I*c^3*d^4*b*arctan(c*x)*x^7-c^2*d^4*a*x^6+4/5*I*c*d^4
*b*arctan(c*x)*x^5+1/4*d^4*a*x^4+1/8*c^4*d^4*b*arctan(c*x)*x^8+24/35*I*b*d^
4*x^2/c^2-c^2*d^4*b*arctan(c*x)*x^6-12/35*I*b*d^4*x^4+1/4*d^4*b*arctan(c*x)
*x^4+11/8*b*d^4*x/c^3-1/56*b*c^3*d^4*x^7+2/21*I*b*c^2*d^4*x^6+9/40*b*c*d^4*
x^5+4/5*I*c*d^4*a*x^5-11/24*b*d^4*x^3/c-4/7*I*c^3*d^4*a*x^7-24/35*I*b*d^4*l
n(c^2*x^2+1)/c^4-11/8*b*d^4*arctan(c*x)/c^4
```

maxima [A] time = 0.41, size = 337, normalized size = 1.42

$$\frac{1}{8}\,ac^4d^4x^8-\frac{4}{7}i\,ac^3d^4x^7-ac^2d^4x^6+\frac{4}{5}i\,acd^4x^5+\frac{1}{840}\left(105\,x^8\arctan(cx)-c\left(\frac{15\,c^6x^7-21\,c^4x^5+35\,c^2x^3-105\,x}{c^8}+\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*c^4*d^4*x^8 - 4/7*I*a*c^3*d^4*x^7 - a*c^2*d^4*x^6 + 4/5*I*a*c*d^4*x^5
 + 1/840*(105*x^8*arctan(c*x) - c*((15*c^6*x^7 - 21*c^4*x^5 + 35*c^2*x^3 -
105*x)/c^8 + 105*arctan(c*x)/c^9))*b*c^4*d^4 - 1/21*I*(12*x^7*arctan(c*x) -
 c*((2*c^4*x^6 - 3*c^2*x^4 + 6*x^2)/c^6 - 6*log(c^2*x^2 + 1)/c^8))*b*c^3*d^
4 + 1/4*a*d^4*x^4 - 1/15*(15*x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 +
15*x)/c^6 - 15*arctan(c*x)/c^7))*b*c^2*d^4 + 1/5*I*(4*x^5*arctan(c*x) - c*(
(c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*c*d^4 + 1/12*(3*x^4*arct
an(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*d^4
```

mupad [B] time = 2.59, size = 217, normalized size = 0.91

$$\frac{c^4\,d^4\,\left(105\,a\,x^8+105\,b\,x^8\,\mathrm{atan}\left(c\,x\right)\right)}{840}+\frac{d^4\,\left(210\,a\,x^4+210\,b\,x^4\,\mathrm{atan}\left(c\,x\right)-b\,x^4\,288\mathrm{i}\right)}{840}-\frac{\frac{d^4\,\left(1155\,b\,\mathrm{atan}(c\,x)+b\,\ln\left(c^2\,x^2+\right.\right.}{840}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + c*d*x*1i)^4,x)
```

```
[Out] (d^4*(210*a*x^4 - b*x^4*288i + 210*b*x^4*atan(c*x)))/840 - ((d^4*(1155*b*at
an(c*x) + b*log(c^2*x^2 + 1)*576i))/840 - (b*c^2*d^4*x^2*24i)/35 + (11*b*c^
```

```
3*d^4*x^3)/24 - (11*b*c*d^4*x)/8)/c^4 + (c^4*d^4*(105*a*x^8 + 105*b*x^8*ata
n(c*x)))/840 + (c*d^4*(a*x^5*672i + 189*b*x^5 + b*x^5*atan(c*x)*672i))/840
- (c^3*d^4*(a*x^7*480i + 15*b*x^7 + b*x^7*atan(c*x)*480i))/840 - (c^2*d^4*(
840*a*x^6 - b*x^6*80i + 840*b*x^6*atan(c*x)))/840
```

sympy [A] time = 6.70, size = 389, normalized size = 1.63

$$\frac{ac^4d^4x^8}{8}-\frac{11bd^4x^3}{24c}+\frac{24ibd^4x^2}{35c^2}+\frac{11bd^4x}{8c^3}+\frac{bd^4\left(\frac{i\log\left(5893bcd^4x-5893ibd^4\right)}{560}-\frac{1471i\log\left(5893bcd^4x+5893ibd^4\right)}{1260}\right)}{c^4}+x^7\left(-\frac{4iac^3d^4}{7}-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+I*c*d*x)**4*(a+b*atan(c*x)),x)
```

```
[Out] a*c**4*d**4*x**8/8 - 11*b*d**4*x**3/(24*c) + 24*I*b*d**4*x**2/(35*c**2) + 1
1*b*d**4*x/(8*c**3) + b*d**4*(I*log(5893*b*c*d**4*x - 5893*I*b*d**4)/560 -
1471*I*log(5893*b*c*d**4*x + 5893*I*b*d**4)/1260)/c**4 + x**7*(-4*I*a*c**3*
d**4/7 - b*c**3*d**4/56) + x**6*(-a*c**2*d**4 + 2*I*b*c**2*d**4/21) + x**5*
(4*I*a*c*d**4/5 + 9*b*c*d**4/40) + x**4*(a*d**4/4 - 12*I*b*d**4/35) + (-I*b
*c**4*d**4*x**8/16 - 2*b*c**3*d**4*x**7/7 + I*b*c**2*d**4*x**6/2 + 2*b*c*d*
*4*x**5/5 - I*b*d**4*x**4/8)*log(I*c*x + 1) - (-315*I*b*c**8*d**4*x**8 - 14
40*b*c**7*d**4*x**7 + 2520*I*b*c**6*d**4*x**6 + 2016*b*c**5*d**4*x**5 - 630
*I*b*c**4*d**4*x**4 + 1037*I*b*d**4)*log(-I*c*x + 1)/(5040*c**4)
```

3.32 $\int x^2(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=193

$$\frac{id^4(1+icx)^7\left(a+b\tan^{-1}(cx)\right)}{7c^3}-\frac{id^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{3c^3}+\frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^3}-\frac{1}{42}bc^3d^4x^6+\frac{1}{}$$

```
[Out] 5/3*I*b*d^4*x/c^2-88/105*b*d^4*x^2/c-5/9*I*b*d^4*x^3+47/140*b*c*d^4*x^4+2/1
5*I*b*c^2*d^4*x^5-1/42*b*c^3*d^4*x^6+1/5*I*d^4*(1+I*c*x)^5*(a+b*arctan(c*x)
)/c^3-1/3*I*d^4*(1+I*c*x)^6*(a+b*arctan(c*x))/c^3+1/7*I*d^4*(1+I*c*x)^7*(a+
b*arctan(c*x))/c^3+176/105*b*d^4*ln(I+c*x)/c^3
```

Rubi [A] time = 0.17, antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {43, 4872, 12, 893}

$$\frac{id^4(1+icx)^7\left(a+b\tan^{-1}(cx)\right)}{7c^3}-\frac{id^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{3c^3}+\frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^3}-\frac{1}{42}bc^3d^4x^6+\frac{2}{1}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] (((5*I)/3)*b*d^4*x)/c^2 - (88*b*d^4*x^2)/(105*c) - ((5*I)/9)*b*d^4*x^3 + (4
7*b*c*d^4*x^4)/140 + ((2*I)/15)*b*c^2*d^4*x^5 - (b*c^3*d^4*x^6)/42 + ((I/5)
*d^4*(1 + I*c*x)^5*(a + b*ArcTan[c*x]))/c^3 - ((I/3)*d^4*(1 + I*c*x)^6*(a +
 b*ArcTan[c*x]))/c^3 + ((I/7)*d^4*(1 + I*c*x)^7*(a + b*ArcTan[c*x]))/c^3 +
(176*b*d^4*Log[I + c*x])/(105*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x^2(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)\,dx = \frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^3} - \frac{id^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{3c^3} + \frac{id^4(1+$$

$$= \frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^3} - \frac{id^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{3c^3} + \frac{id^4(1+$$

$$= \frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^3} - \frac{id^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{3c^3} + \frac{id^4(1+$$

$$= \frac{5ibd^4x}{3c^2} - \frac{88bd^4x^2}{105c} - \frac{5}{9}ibd^4x^3 + \frac{47}{140}bcd^4x^4 + \frac{2}{15}ibc^2d^4x^5 - \frac{1}{42}bc^3d^4x^6 +$$

Mathematica [A] time = 0.13, size = 276, normalized size = 1.43

$$\frac{1}{7}ac^4d^4x^7-\frac{2}{3}iac^3d^4x^6-\frac{6}{5}ac^2d^4x^5+iacd^4x^4+\frac{1}{3}ad^4x^3+\frac{1}{7}bc^4d^4x^7\tan^{-1}(cx)-\frac{1}{42}bc^3d^4x^6-\frac{2}{3}ibc^3d^4x^6\tan^{-1}(cx)-\frac{5ibd^4}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] (((5*I)/3)*b*d^4*x)/c^2 - (88*b*d^4*x^2)/(105*c) + (a*d^4*x^3)/3 - ((5*I)/9
)*b*d^4*x^3 + I*a*c*d^4*x^4 + (47*b*c*d^4*x^4)/140 - (6*a*c^2*d^4*x^5)/5 +
((2*I)/15)*b*c^2*d^4*x^5 - ((2*I)/3)*a*c^3*d^4*x^6 - (b*c^3*d^4*x^6)/42 + (
a*c^4*d^4*x^7)/7 - (((5*I)/3)*b*d^4*ArcTan[c*x])/c^3 + (b*d^4*x^3*ArcTan[c*
x])/3 + I*b*c*d^4*x^4*ArcTan[c*x] - (6*b*c^2*d^4*x^5*ArcTan[c*x])/5 - ((2*I
)/3)*b*c^3*d^4*x^6*ArcTan[c*x] + (b*c^4*d^4*x^7*ArcTan[c*x])/7 + (88*b*d^4*
Log[1 + c^2*x^2])/(105*c^3)
```

fricas [A] time = 0.45, size = 217, normalized size = 1.12

$$\frac{180\,ac^7d^4x^7 + (-840i\,a - 30\,b)c^6d^4x^6 - 168\,(9\,a - i\,b)c^5d^4x^5 + (1260i\,a + 423\,b)c^4d^4x^4 + 140\,(3\,a - 5i\,b)c^3d^4x^3 - }{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/1260*(180*a*c^7*d^4*x^7 + (-840*I*a - 30*b)*c^6*d^4*x^6 - 168*(9*a - I*b)
*c^5*d^4*x^5 + (1260*I*a + 423*b)*c^4*d^4*x^4 + 140*(3*a - 5*I*b)*c^3*d^4*x
^3 - 1056*b*c^2*d^4*x^2 + 2100*I*b*c*d^4*x + 2106*b*d^4*log((c*x + I)/c) +
6*b*d^4*log((c*x - I)/c) + (90*I*b*c^7*d^4*x^7 + 420*b*c^6*d^4*x^6 - 756*I*
b*c^5*d^4*x^5 - 630*b*c^4*d^4*x^4 + 210*I*b*c^3*d^4*x^3)*log(-(c*x + I)/(c*
x - I)))/c^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 237, normalized size = 1.23

$$\frac{c^4d^4a\,x^7}{7}-\frac{5id^4b\arctan(cx)}{3c^3}-\frac{6c^2d^4a\,x^5}{5}-\frac{2ic^3d^4b\arctan(cx)\,x^6}{3}+\frac{d^4a\,x^3}{3}+\frac{c^4d^4b\arctan(cx)\,x^7}{7}+ic\,d^4a\,x^4-\frac{6c^2d^4b\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x)
```

```
[Out] 1/7*c^4*d^4*a*x^7-5/3*I/c^3*d^4*b*arctan(c*x)-6/5*c^2*d^4*a*x^5-2/3*I*c^3*d
^4*b*arctan(c*x)*x^6+1/3*d^4*a*x^3+1/7*c^4*d^4*b*arctan(c*x)*x^7+I*c*d^4*a*
x^4-6/5*c^2*d^4*b*arctan(c*x)*x^5-5/9*I*b*d^4*x^3+1/3*d^4*b*arctan(c*x)*x^3
+I*c*d^4*b*arctan(c*x)*x^4-1/42*b*c^3*d^4*x^6+5/3*I*b*d^4*x/c^2+47/140*b*c*
d^4*x^4-2/3*I*c^3*d^4*a*x^6-88/105*b*d^4*x^2/c+88/105/c^3*d^4*b*ln(c^2*x^2+
1)+2/15*I*b*c^2*d^4*x^5
```

maxima [B] time = 0.41, size = 318, normalized size = 1.65

$$\frac{1}{7}\,ac^4d^4x^7-\frac{2}{3}i\,ac^3d^4x^6-\frac{6}{5}\,ac^2d^4x^5+\frac{1}{84}\left(12\,x^7\arctan\left(cx\right)-c\left(\frac{2\,c^4x^6-3\,c^2x^4+6\,x^2}{c^6}-\frac{6\,\log\left(c^2x^2+1\right)}{c^8}\right)\right)bc^4d^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*c^4*d^4*x^7 - 2/3*I*a*c^3*d^4*x^6 - 6/5*a*c^2*d^4*x^5 + 1/84*(12*x^7*
arctan(c*x) - c*((2*c^4*x^6 - 3*c^2*x^4 + 6*x^2)/c^6 - 6*log(c^2*x^2 + 1)/c
^8))*b*c^4*d^4 + I*a*c*d^4*x^4 - 2/45*I*(15*x^6*arctan(c*x) - c*((3*c^4*x^5
 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*c^3*d^4 - 3/10*(4*x^5*arc
tan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*c^2*d^4 +
1/3*a*d^4*x^3 + 1/3*I*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arcta
n(c*x)/c^5))*b*c*d^4 + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 +
1)/c^4))*b*d^4
```

mupad [B] time = 0.64, size = 205, normalized size = 1.06

$$\frac{c^4\,d^4\,\left(180\,a\,x^7+180\,b\,x^7\,\mathrm{atan}\left(c\,x\right)\right)}{1260}+\frac{d^4\,\left(420\,a\,x^3+420\,b\,x^3\,\mathrm{atan}\left(c\,x\right)-b\,x^3\,700\mathrm{i}\right)}{1260}-\frac{\frac{d^4\,\left(-1056\,b\,\ln\left(c^2\,x^2+1\right)+b\,\mathrm{atan}\right.}{1260}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + c*d*x*1i)^4,x)
```

```
[Out] (d^4*(420*a*x^3 - b*x^3*700i + 420*b*x^3*atan(c*x)))/1260 - ((d^4*(b*atan(c
*x)*2100i - 1056*b*log(c^2*x^2 + 1)))/1260 + (88*b*c^2*d^4*x^2)/105 - (b*c*
d^4*x*5i)/3)/c^3 + (c^4*d^4*(180*a*x^7 + 180*b*x^7*atan(c*x)))/1260 + (c*d^
4*(a*x^4*1260i + 423*b*x^4 + b*x^4*atan(c*x)*1260i))/1260 - (c^3*d^4*(a*x^6
*840i + 30*b*x^6 + b*x^6*atan(c*x)*840i))/1260 - (c^2*d^4*(1512*a*x^5 - b*x
^5*168i + 1512*b*x^5*atan(c*x)))/1260
```

sympy [A] time = 5.99, size = 367, normalized size = 1.90

$$\frac{ac^4d^4x^7}{7}-\frac{88bd^4x^2}{105c}+\frac{5ibd^4x}{3c^2}+\frac{bd^4\left(\frac{\log\left(2299bcd^4x-2299ibd^4\right)}{210}+\frac{769\log\left(2299bcd^4x+2299ibd^4\right)}{560}\right)}{c^3}+x^6\left(-\frac{2iac^3d^4}{3}-\frac{bc^3d^4}{42}\right)+x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+I*c*d*x)**4*(a+b*atan(c*x)),x)
```

```
[Out] a*c**4*d**4*x**7/7 - 88*b*d**4*x**2/(105*c) + 5*I*b*d**4*x/(3*c**2) + b*d**
4*(log(2299*b*c*d**4*x - 2299*I*b*d**4)/210 + 769*log(2299*b*c*d**4*x + 229
9*I*b*d**4)/560)/c**3 + x**6*(-2*I*a*c**3*d**4/3 - b*c**3*d**4/42) + x**5*(
-6*a*c**2*d**4/5 + 2*I*b*c**2*d**4/15) + x**4*(I*a*c*d**4 + 47*b*c*d**4/140
) + x**3*(a*d**4/3 - 5*I*b*d**4/9) + (-I*b*c**4*d**4*x**7/14 - b*c**3*d**4*
x**6/3 + 3*I*b*c**2*d**4*x**5/5 + b*c*d**4*x**4/2 - I*b*d**4*x**3/6)*log(I*
```

```
c*x + 1) - (-120*I*b*c**7*d**4*x**7 - 560*b*c**6*d**4*x**6 + 1008*I*b*c**5*
d**4*x**5 + 840*b*c**4*d**4*x**4 - 280*I*b*c**3*d**4*x**3 - 501*b*d**4)*log
(-I*c*x + 1)/(1680*c**3)
```

3.33 $\int x(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=178

$$-\frac{d^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{6c^2}+\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}+\frac{bd^4(-cx+i)^5}{30c^2}+\frac{ibd^4(-cx+i)^4}{30c^2}-\frac{4bd^4(-cx+i)}{45c^2}$$

```
[Out] -16/15*b*d^4*x/c-4/15*I*b*d^4*(I-c*x)^2/c^2-4/45*b*d^4*(I-c*x)^3/c^2+1/30*I
*b*d^4*(I-c*x)^4/c^2+1/30*b*d^4*(I-c*x)^5/c^2+1/5*d^4*(1+I*c*x)^5*(a+b*arct
an(c*x))/c^2-1/6*d^4*(1+I*c*x)^6*(a+b*arctan(c*x))/c^2+32/15*I*b*d^4*ln(I+c
*x)/c^2
```

Rubi [A] time = 0.11, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {43, 4872, 12, 77}

$$-\frac{d^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{6c^2}+\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}+\frac{bd^4(-cx+i)^5}{30c^2}+\frac{ibd^4(-cx+i)^4}{30c^2}-\frac{4bd^4(-cx+i)}{45c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] (-16*b*d^4*x)/(15*c) - (((4*I)/15)*b*d^4*(I - c*x)^2)/c^2 - (4*b*d^4*(I - c
*x)^3)/(45*c^2) + ((I/30)*b*d^4*(I - c*x)^4)/c^2 + (b*d^4*(I - c*x)^5)/(30*
c^2) + (d^4*(1 + I*c*x)^5*(a + b*ArcTan[c*x]))/(5*c^2) - (d^4*(1 + I*c*x)^6
*(a + b*ArcTan[c*x]))/(6*c^2) + (((32*I)/15)*b*d^4*Log[I + c*x])/c^2
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int x(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)dx=\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{d^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{6c^2}-(bc)\int\frac{d^4}{}$$
$$=\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{d^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{6c^2}-\frac{\left(bd^4\right)\int}{}$$
$$=\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{d^4(1+icx)^6\left(a+b\tan^{-1}(cx)\right)}{6c^2}-\frac{\left(bd^4\right)\int\left(\right.}{}$$
$$=-\frac{16bd^4x}{15c}-\frac{4ibd^4(i-cx)^2}{15c^2}-\frac{4bd^4(i-cx)^3}{45c^2}+\frac{ibd^4(i-cx)^4}{30c^2}+\frac{bd^4(i-cx)^5}{30c^2}+$$

Mathematica [A] time = 0.11, size = 264, normalized size = 1.48

$$\frac{1}{6}ac^4d^4x^6-\frac{4}{5}iac^3d^4x^5-\frac{3}{2}ac^2d^4x^4+\frac{4}{3}iacd^4x^3+\frac{1}{2}ad^4x^2+\frac{1}{6}bc^4d^4x^6\tan^{-1}(cx)-\frac{1}{30}bc^3d^4x^5-\frac{4}{5}ibc^3d^4x^5\tan^{-1}(cx)+\frac{1}{5}ibc$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] (-13*b*d^4*x)/(6*c) + (a*d^4*x^2)/2 - ((16*I)/15)*b*d^4*x^2 + ((4*I)/3)*a*c
*d^4*x^3 + (5*b*c*d^4*x^3)/9 - (3*a*c^2*d^4*x^4)/2 + (I/5)*b*c^2*d^4*x^4 -
((4*I)/5)*a*c^3*d^4*x^5 - (b*c^3*d^4*x^5)/30 + (a*c^4*d^4*x^6)/6 + (13*b*d^
4*ArcTan[c*x])/(6*c^2) + (b*d^4*x^2*ArcTan[c*x])/2 + ((4*I)/3)*b*c*d^4*x^3*
ArcTan[c*x] - (3*b*c^2*d^4*x^4*ArcTan[c*x])/2 - ((4*I)/5)*b*c^3*d^4*x^5*Arc
Tan[c*x] + (b*c^4*d^4*x^6*ArcTan[c*x])/6 + (((16*I)/15)*b*d^4*Log[1 + c^2*x
^2])/c^2
```

fricas [A] time = 1.36, size = 205, normalized size = 1.15

$$\frac{30\,ac^6d^4x^6+(-144i\,a-6\,b)c^5d^4x^5-18\,(15\,a-2i\,b)c^4d^4x^4+(240i\,a+100\,b)c^3d^4x^3+6\,(15\,a-32i\,b)c^2d^4x^2-390}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/180*(30*a*c^6*d^4*x^6 + (-144*I*a - 6*b)*c^5*d^4*x^5 - 18*(15*a - 2*I*b)*
c^4*d^4*x^4 + (240*I*a + 100*b)*c^3*d^4*x^3 + 6*(15*a - 32*I*b)*c^2*d^4*x^2
 - 390*b*c*d^4*x + 387*I*b*d^4*log((c*x + I)/c) - 3*I*b*d^4*log((c*x - I)/c
) + (15*I*b*c^6*d^4*x^6 + 72*b*c^5*d^4*x^5 - 135*I*b*c^4*d^4*x^4 - 120*b*c^
3*d^4*x^3 + 45*I*b*c^2*d^4*x^2)*log(-(c*x + I)/(c*x - I)))/c^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 224, normalized size = 1.26

$$\frac{c^4d^4a\,x^6}{6}-\frac{4ic^3d^4b\arctan(cx)\,x^5}{5}-\frac{3c^2d^4a\,x^4}{2}-\frac{4ic^3d^4a\,x^5}{5}+\frac{d^4a\,x^2}{2}+\frac{c^4d^4b\arctan(cx)\,x^6}{6}+\frac{4ic\,d^4b\arctan(cx)\,x^3}{3}-\frac{3c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x)
```

```
[Out] 1/6*c^4*d^4*a*x^6-4/5*I*c^3*d^4*b*arctan(c*x)*x^5-3/2*c^2*d^4*a*x^4-4/5*I*c
^3*d^4*a*x^5+1/2*d^4*a*x^2+1/6*c^4*d^4*b*arctan(c*x)*x^6+4/3*I*c*d^4*b*arct
an(c*x)*x^3-3/2*c^2*d^4*b*arctan(c*x)*x^4+1/5*I*c^2*d^4*b*x^4+1/2*d^4*b*arc
tan(c*x)*x^2-13/6*b*d^4*x/c-1/30*c^3*d^4*b*x^5+4/3*I*c*d^4*a*x^3+5/9*c*d^4*
b*x^3-16/15*I*d^4*b*x^2+16/15*I/c^2*d^4*b*ln(c^2*x^2+1)+13/6/c^2*d^4*b*arct
an(c*x)
```

maxima [B] time = 0.41, size = 290, normalized size = 1.63

$$\frac{1}{6}ac^4d^4x^6-\frac{4}{5}i\,ac^3d^4x^5-\frac{3}{2}ac^2d^4x^4+\frac{1}{90}\left(15\,x^6\arctan(cx)-c\left(\frac{3\,c^4x^5-5\,c^2x^3+15\,x}{c^6}-\frac{15\arctan(cx)}{c^7}\right)\right)bc^4d^4-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*c^4*d^4*x^6 - 4/5*I*a*c^3*d^4*x^5 - 3/2*a*c^2*d^4*x^4 + 1/90*(15*x^6*
arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*
b*c^4*d^4 - 1/5*I*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2
*x^2 + 1)/c^6))*b*c^3*d^4 + 4/3*I*a*c*d^4*x^3 - 1/2*(3*x^4*arctan(c*x) - c*
((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*c^2*d^4 + 2/3*I*(2*x^3*arctan(
c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*c*d^4 + 1/2*a*d^4*x^2 + 1/2*(x
^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*d^4
```

mupad [B] time = 0.79, size = 191, normalized size = 1.07

$$\frac{\frac{d^4\left(195\,b\,\mathrm{atan}(c\,x)+b\,\ln\left(c^2\,x^2+1\right)\,96\mathrm{i}\right)}{90}-\frac{13\,b\,c\,d^4\,x}{6}}{c^2}+\frac{d^4\,\left(45\,a\,x^2+45\,b\,x^2\,\mathrm{atan}\left(c\,x\right)-b\,x^2\,96\mathrm{i}\right)}{90}+\frac{c^4\,d^4\,\left(15\,a\,x^6+15\,b\,x^6\,\mathrm{at}\right.}{90}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + c*d*x*1i)^4,x)
```

```
[Out] ((d^4*(195*b*atan(c*x) + b*log(c^2*x^2 + 1)*96i))/90 - (13*b*c*d^4*x)/6)/c^
2 + (d^4*(45*a*x^2 - b*x^2*96i + 45*b*x^2*atan(c*x)))/90 + (c^4*d^4*(15*a*x
^6 + 15*b*x^6*atan(c*x)))/90 + (c*d^4*(a*x^3*120i + 50*b*x^3 + b*x^3*atan(c
*x)*120i))/90 - (c^3*d^4*(a*x^5*72i + 3*b*x^5 + b*x^5*atan(c*x)*72i))/90 -
(c^2*d^4*(135*a*x^4 - b*x^4*18i + 135*b*x^4*atan(c*x)))/90
```

sympy [B] time = 5.47, size = 360, normalized size = 2.02

$$\frac{ac^4d^4x^6}{6}-\frac{13bd^4x}{6c}+\frac{bd^4\left(-\frac{i\log\left(709bcd^4x-709ibd^4\right)}{60}+\frac{117i\log\left(709bcd^4x+709ibd^4\right)}{70}\right)}{c^2}+x^5\left(-\frac{4iac^3d^4}{5}-\frac{bc^3d^4}{30}\right)+x^4\left(-\frac{3ac^2d^4}{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)**4*(a+b*atan(c*x)),x)
```

```
[Out] a*c**4*d**4*x**6/6 - 13*b*d**4*x/(6*c) + b*d**4*(-I*log(709*b*c*d**4*x - 70
9*I*b*d**4)/60 + 117*I*log(709*b*c*d**4*x + 709*I*b*d**4)/70)/c**2 + x**5*(
-4*I*a*c**3*d**4/5 - b*c**3*d**4/30) + x**4*(-3*a*c**2*d**4/2 + I*b*c**2*d*
*4/5) + x**3*(4*I*a*c*d**4/3 + 5*b*c*d**4/9) + x**2*(a*d**4/2 - 16*I*b*d**4
/15) + (-I*b*c**4*d**4*x**6/12 - 2*b*c**3*d**4*x**5/5 + 3*I*b*c**2*d**4*x**
4/4 + 2*b*c*d**4*x**3/3 - I*b*d**4*x**2/4)*log(I*c*x + 1) - (-35*I*b*c**6*d
**4*x**6 - 168*b*c**5*d**4*x**5 + 315*I*b*c**4*d**4*x**4 + 280*b*c**3*d**4*
x**3 - 105*I*b*c**2*d**4*x**2 - 201*I*b*d**4)*log(-I*c*x + 1)/(420*c**2)
```

3.34 $\int (d+icdx)^4 \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=125

$$-\frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c}-\frac{bd^4(1+icx)^4}{20c}-\frac{2bd^4(1+icx)^3}{15c}-\frac{2bd^4(1+icx)^2}{5c}-\frac{16bd^4\log(1-icx)}{5c}-\frac{8}{5}ibd^4x$$

```
[Out] -8/5*I*b*d^4*x-2/5*b*d^4*(1+I*c*x)^2/c-2/15*b*d^4*(1+I*c*x)^3/c-1/20*b*d^4*
(1+I*c*x)^4/c-1/5*I*d^4*(1+I*c*x)^5*(a+b*arctan(c*x))/c-16/5*b*d^4*ln(1-I*c
*x)/c
```

Rubi [A] time = 0.06, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = $\{4862, 627, 43\}$

$$-\frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c}-\frac{bd^4(1+icx)^4}{20c}-\frac{2bd^4(1+icx)^3}{15c}-\frac{2bd^4(1+icx)^2}{5c}-\frac{16bd^4\log(1-icx)}{5c}-\frac{8}{5}ibd^4x$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] ((-8*I)/5)*b*d^4*x - (2*b*d^4*(1 + I*c*x)^2)/(5*c) - (2*b*d^4*(1 + I*c*x)^3
)/(15*c) - (b*d^4*(1 + I*c*x)^4)/(20*c) - ((I/5)*d^4*(1 + I*c*x)^5*(a + b*A
rcTan[c*x]))/c - (16*b*d^4*Log[1 - I*c*x])/(5*c)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int (d+icdx)^4 \left(a+b\tan^{-1}(cx)\right) dx = -\frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c} + \frac{(ib)\int \frac{(d+icdx)^5}{1+c^2x^2}dx}{5d}$$
$$= -\frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c} + \frac{(ib)\int \frac{(d+icdx)^4}{\frac{1}{d}-\frac{icx}{d}}dx}{5d}$$
$$= -\frac{id^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5c} + \frac{(ib)\int \left(-8d^5+\frac{16d^4}{\frac{1}{d}-\frac{icx}{d}}-4d^4(d+icdx)-\right.}{5d}$$
$$= -\frac{8}{5}ibd^4x - \frac{2bd^4(1+icx)^2}{5c} - \frac{2bd^4(1+icx)^3}{15c} - \frac{bd^4(1+icx)^4}{20c} - \frac{id^4(1+icx}{}$$

Mathematica [A] time = 0.03, size = 77, normalized size = 0.62

$$\frac{d^4\left(12(cx-i)^5\left(a+b\tan^{-1}(cx)\right)-b\left(3c^4x^4-20ic^3x^3-66c^2x^2+180icx+192\log(cx+i)+35\right)\right)}{60c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + I*c*d*x)^4*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d^4*(12*(-I + c*x)^5*(a + b*ArcTan[c*x]) - b*(35 + (180*I)*c*x - 66*c^2*x^
2 - (20*I)*c^3*x^3 + 3*c^4*x^4 + 192*Log[I + c*x])))/(60*c)
```

fricas [A] time = 0.61, size = 187, normalized size = 1.50

$$\frac{12\,ac^5d^4x^5+(-60i\,a-3\,b)c^4d^4x^4-20\,(6\,a-i\,b)c^3d^4x^3+(120i\,a+66\,b)c^2d^4x^2+60\,(a-3i\,b)cd^4x-186\,bd^4\,\mathrm{lo}}{60\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/60*(12*a*c^5*d^4*x^5 + (-60*I*a - 3*b)*c^4*d^4*x^4 - 20*(6*a - I*b)*c^3*d
^4*x^3 + (120*I*a + 66*b)*c^2*d^4*x^2 + 60*(a - 3*I*b)*c*d^4*x - 186*b*d^4*
log((c*x + I)/c) - 6*b*d^4*log((c*x - I)/c) + (6*I*b*c^5*d^4*x^5 + 30*b*c^4
*d^4*x^4 - 60*I*b*c^3*d^4*x^3 - 60*b*c^2*d^4*x^2 + 30*I*b*c*d^4*x)*log(-(c*
x + I)/(c*x - I)))/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.04, size = 216, normalized size = 1.73

$$\frac{c^4d^4a\,x^5}{5}-ic^3x^4a\,d^4-2c^2d^4a\,x^3-3id^4bx+ax\,d^4+2ic\,d^4b\arctan(cx)\,x^2+\frac{c^4d^4b\arctan(cx)\,x^5}{5}-\frac{id^4a}{5c}-2c^2d^4b\,\mathrm{arcta}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x)),x)
```

```
[Out] 1/5*c^4*d^4*a*x^5-I*c^3*x^4*a*d^4-2*c^2*d^4*a*x^3-3*I*d^4*b*x+a*x*d^4+2*I*c
*d^4*b*arctan(c*x)*x^2+1/5*c^4*d^4*b*arctan(c*x)*x^5-1/5*I/c*d^4*a-2*c^2*d^
4*b*arctan(c*x)*x^3-I*c^3*d^4*b*arctan(c*x)*x^4+b*arctan(c*x)*x*d^4+3*I/c*d
^4*b*arctan(c*x)+2*I*c*x^2*a*d^4-1/20*c^3*d^4*b*x^4+1/3*I*c^2*d^4*b*x^3+11/
10*c*d^4*b*x^2-8/5/c*b*ln(c^2*x^2+1)*d^4
```

maxima [B] time = 0.41, size = 264, normalized size = 2.11

$$\frac{1}{5}ac^4d^4x^5 - i\,ac^3d^4x^4 + \frac{1}{20}\left(4x^5\arctan(cx) - c\left(\frac{c^2x^4 - 2x^2}{c^4} + \frac{2\log\left(c^2x^2+1\right)}{c^6}\right)\right)bc^4d^4 - 2\,ac^2d^4x^3 - \frac{1}{3}i\left(3x^4\arctan\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*c^4*d^4*x^5 - I*a*c^3*d^4*x^4 + 1/20*(4*x^5*arctan(c*x) - c*((c^2*x^4
 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*c^4*d^4 - 2*a*c^2*d^4*x^3 - 1/3*
I*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*c^3*d
^4 - (2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*c^2*d^4 + 2
*I*a*c*d^4*x^2 + 2*I*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*c*d^
4 + a*d^4*x + 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d^4/c
```

mupad [B] time = 0.74, size = 175, normalized size = 1.40

$$\frac{d^4\,\left(60\,a\,x + 60\,b\,x\,\mathrm{atan}\left(c\,x\right) - b\,x\,180\mathrm{i}\right)}{60} + \frac{c^4\,d^4\,\left(12\,a\,x^5 + 12\,b\,x^5\,\mathrm{atan}\left(c\,x\right)\right)}{60} + \frac{d^4\,\left(-96\,b\,\ln\left(c^2\,x^2+1\right) + b\,\mathrm{atan}\left(c\right.\right.}{60\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + c*d*x*1i)^4,x)
```

```
[Out] (d^4*(60*a*x - b*x*180i + 60*b*x*atan(c*x)))/60 + (c^4*d^4*(12*a*x^5 + 12*b
*x^5*atan(c*x)))/60 + (d^4*(b*atan(c*x)*180i - 96*b*log(c^2*x^2 + 1)))/(60*
c) + (c*d^4*(a*x^2*120i + 66*b*x^2 + b*x^2*atan(c*x)*120i))/60 - (c^3*d^4*(
a*x^4*60i + 3*b*x^4 + b*x^4*atan(c*x)*60i))/60 - (c^2*d^4*(120*a*x^3 - b*x^
3*20i + 120*b*x^3*atan(c*x)))/60
```

sympy [B] time = 4.60, size = 316, normalized size = 2.53

$$\frac{ac^4d^4x^5}{5} + \frac{bd^4\left(-\frac{\log\left(41bcd^4x - 41ibd^4\right)}{10} - \frac{43\log\left(41bcd^4x + 41ibd^4\right)}{20}\right)}{c} + x^4\left(-iac^3d^4 - \frac{bc^3d^4}{20}\right) + x^3\left(-2ac^2d^4 + \frac{ibc^2d^4}{3}\right) + x^2\left(2iac\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x)),x)
```

```
[Out] a*c**4*d**4*x**5/5 + b*d**4*(-log(41*b*c*d**4*x - 41*I*b*d**4)/10 - 43*log(
41*b*c*d**4*x + 41*I*b*d**4)/20)/c + x**4*(-I*a*c**3*d**4 - b*c**3*d**4/20)
 + x**3*(-2*a*c**2*d**4 + I*b*c**2*d**4/3) + x**2*(2*I*a*c*d**4 + 11*b*c*d*
*4/10) + x*(a*d**4 - 3*I*b*d**4) + (-I*b*c**4*d**4*x**5/10 - b*c**3*d**4*x*
*4/2 + I*b*c**2*d**4*x**3 + b*c*d**4*x**2 - I*b*d**4*x/2)*log(I*c*x + 1) -
(-2*I*b*c**5*d**4*x**5 - 10*b*c**4*d**4*x**4 + 20*I*b*c**3*d**4*x**3 + 20*b
*c**2*d**4*x**2 - 10*I*b*c*d**4*x + 19*b*d**4)*log(-I*c*x + 1)/(20*c)
```

3.35 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=203

$$\frac{1}{4}c^4d^4x^4\left(a+b\tan^{-1}(cx)\right)-\frac{4}{3}ic^3d^4x^3\left(a+b\tan^{-1}(cx)\right)-3c^2d^4x^2\left(a+b\tan^{-1}(cx)\right)+4iacd^4x+ad^4\log(x)-\frac{1}{12}bc^3$$

```
[Out] 4*I*a*c*d^4*x+13/4*b*c*d^4*x+2/3*I*b*c^2*d^4*x^2-1/12*b*c^3*d^4*x^3-13/4*b*
d^4*arctan(c*x)+4*I*b*c*d^4*x*arctan(c*x)-3*c^2*d^4*x^2*(a+b*arctan(c*x))-4
/3*I*c^3*d^4*x^3*(a+b*arctan(c*x))+1/4*c^4*d^4*x^4*(a+b*arctan(c*x))+a*d^4*
ln(x)-8/3*I*b*d^4*ln(c^2*x^2+1)+1/2*I*b*d^4*polylog(2,-I*c*x)-1/2*I*b*d^4*p
olylog(2,I*c*x)
```

Rubi [A] time = 0.21, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {4876, 4846, 260, 4848, 2391, 4852, 321, 203, 266, 43, 302}

$$\frac{1}{2}ibd^4\text{PolyLog}(2,-icx)-\frac{1}{2}ibd^4\text{PolyLog}(2,icx)+\frac{1}{4}c^4d^4x^4\left(a+b\tan^{-1}(cx)\right)-\frac{4}{3}ic^3d^4x^3\left(a+b\tan^{-1}(cx)\right)-3c^2d^4$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] (4*I)*a*c*d^4*x + (13*b*c*d^4*x)/4 + ((2*I)/3)*b*c^2*d^4*x^2 - (b*c^3*d^4*x
^3)/12 - (13*b*d^4*ArcTan[c*x])/4 + (4*I)*b*c*d^4*x*ArcTan[c*x] - 3*c^2*d^4
*x^2*(a + b*ArcTan[c*x]) - ((4*I)/3)*c^3*d^4*x^3*(a + b*ArcTan[c*x]) + (c^4
*d^4*x^4*(a + b*ArcTan[c*x]))/4 + a*d^4*Log[x] - ((8*I)/3)*b*d^4*Log[1 + c^
2*x^2] + (I/2)*b*d^4*PolyLog[2, (-I)*c*x] - (I/2)*b*d^4*PolyLog[2, I*c*x]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x}\,dx = \int \left(4icd^4\left(a+b\tan^{-1}(cx)\right)+\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{x}-6c^2d^4x\left(a+b\tan^{-1}(cx\right.\right.$$

$$= d^4\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+\left(4icd^4\right)\int \left(a+b\tan^{-1}(cx)\right)dx-\left(6c^2d^4\right)\int x\left(a\right.$$

$$= 4iacd^4x-3c^2d^4x^2\left(a+b\tan^{-1}(cx)\right)-\frac{4}{3}ic^3d^4x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}c^4d^4x$$

$$= 4iacd^4x+3bcd^4x+4ibcd^4x\tan^{-1}(cx)-3c^2d^4x^2\left(a+b\tan^{-1}(cx)\right)-\frac{4}{3}ic^3d^4$$

$$= 4iacd^4x+\frac{13}{4}bcd^4x-\frac{1}{12}bc^3d^4x^3-3bd^4\tan^{-1}(cx)+4ibcd^4x\tan^{-1}(cx)-3c$$

$$= 4iacd^4x+\frac{13}{4}bcd^4x+\frac{2}{3}ibc^2d^4x^2-\frac{1}{12}bc^3d^4x^3-\frac{13}{4}bd^4\tan^{-1}(cx)+4ibcd^4x$$

Mathematica [A] time = 0.15, size = 174, normalized size = 0.86

$$\frac{1}{12}d^4\left(3ac^4x^4-16iac^3x^3-36ac^2x^2+48iacx+12a\log(x)+3bc^4x^4\tan^{-1}(cx)-bc^3x^3-16ibc^3x^3\tan^{-1}(cx)+8\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] (d^4*((48*I)*a*c*x + 39*b*c*x - 36*a*c^2*x^2 + (8*I)*b*c^2*x^2 - (16*I)*a*c
^3*x^3 - b*c^3*x^3 + 3*a*c^4*x^4 - 39*b*ArcTan[c*x] + (48*I)*b*c*x*ArcTan[c
*x] - 36*b*c^2*x^2*ArcTan[c*x] - (16*I)*b*c^3*x^3*ArcTan[c*x] + 3*b*c^4*x^4
*ArcTan[c*x] + 12*a*Log[x] - (32*I)*b*Log[1 + c^2*x^2] + (6*I)*b*PolyLog[2,
 (-I)*c*x] - (6*I)*b*PolyLog[2, I*c*x]))/12
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\,ac^4d^4x^4-8i\,ac^3d^4x^3-12\,ac^2d^4x^2+8i\,acd^4x+2\,ad^4+\left(i\,bc^4d^4x^4+4\,bc^3d^4x^3-6i\,bc^2d^4x^2-4\,bcd^4\right.}{2\,x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*a*c^4*d^4*x^4 - 8*I*a*c^3*d^4*x^3 - 12*a*c^2*d^4*x^2 + 8*I*
a*c*d^4*x + 2*a*d^4 + (I*b*c^4*d^4*x^4 + 4*b*c^3*d^4*x^3 - 6*I*b*c^2*d^4*x^
2 - 4*b*c*d^4*x + I*b*d^4)*log(-(c*x + I)/(c*x - I)))/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 260, normalized size = 1.28

$$\frac{id^4b\,\mathrm{dilog}\,(icx+1)}{2}+\frac{d^4a\,c^4x^4}{4}+\frac{id^4b\ln(cx)\ln(icx+1)}{2}-3d^4a\,c^2x^2+d^4a\ln(cx)-\frac{4id^4b\arctan(cx)\,c^3x^3}{3}+\frac{d^4b\,\mathrm{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x,x)
```

```
[Out] 1/2*I*d^4*b*dilog(1+I*c*x)+1/4*d^4*a*c^4*x^4-1/2*I*d^4*b*dilog(1-I*c*x)-3*d
^4*a*c^2*x^2+d^4*a*ln(c*x)+1/2*I*d^4*b*ln(c*x)*ln(1+I*c*x)+1/4*d^4*b*arctan
(c*x)*c^4*x^4-4/3*I*d^4*b*arctan(c*x)*c^3*x^3-3*d^4*b*arctan(c*x)*c^2*x^2+d
^4*b*ln(c*x)*arctan(c*x)-1/2*I*d^4*b*ln(c*x)*ln(1-I*c*x)+2/3*I*b*c^2*d^4*x^
2-4/3*I*d^4*a*c^3*x^3+4*I*a*c*d^4*x+13/4*b*c*d^4*x-1/12*b*c^3*d^4*x^3+4*I*b
*c*d^4*x*arctan(c*x)-8/3*I*b*d^4*ln(c^2*x^2+1)-13/4*b*d^4*arctan(c*x)
```

maxima [A] time = 0.63, size = 220, normalized size = 1.08

$$\frac{1}{4}\,ac^4d^4x^4-\frac{4}{3}i\,ac^3d^4x^3-\frac{1}{12}\,bc^3d^4x^3-3\,ac^2d^4x^2+\frac{2}{3}i\,bc^2d^4x^2+4i\,acd^4x+\frac{13}{4}\,bcd^4x-\frac{1}{12}\,(3\,\pi+8i)bd^4\log\left(c^2x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/4*a*c^4*d^4*x^4 - 4/3*I*a*c^3*d^4*x^3 - 1/12*b*c^3*d^4*x^3 - 3*a*c^2*d^4*
x^2 + 2/3*I*b*c^2*d^4*x^2 + 4*I*a*c*d^4*x + 13/4*b*c*d^4*x - 1/12*(3*pi + 8
*I)*b*d^4*log(c^2*x^2 + 1) + b*d^4*arctan(c*x)*log(c*x) + 2*I*(2*c*x*arctan
(c*x) - log(c^2*x^2 + 1))*b*d^4 - 1/2*I*b*d^4*dilog(I*c*x + 1) + 1/2*I*b*d^
4*dilog(-I*c*x + 1) + a*d^4*log(x) + 1/12*(3*b*c^4*d^4*x^4 - 16*I*b*c^3*d^4
*x^3 - 36*b*c^2*d^4*x^2 - 39*b*d^4)*arctan(c*x)
```

mupad [B] time = 0.99, size = 248, normalized size = 1.22

$$\begin{cases} a\,d^4\,\ln(x) - b\,d^4\,\ln\left(c^2\,x^2+1\right)\,2\mathrm{i} - \frac{b\,d^4\left(3\,\mathrm{atan}(c\,x)-3\,c\,x+c^3\,x^3\right)}{12} - \frac{b\,d^4\,\mathrm{Li}_2(1-c\,x\,1\mathrm{i})\,1\mathrm{i}}{2} + \frac{b\,d^4\,\mathrm{Li}_2(1+c\,x\,1\mathrm{i})\,1\mathrm{i}}{2} - 3\,a\,c^2\,d^4\,x^2 - \frac{a}{} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x,x)
```

```
[Out] piecewise(c == 0, a*d^4*log(x), c ~= 0, - (b*d^4*(3*atan(c*x) - 3*c*x + c^3
*x^3))/12 - b*d^4*log(c^2*x^2 + 1)*2i + a*d^4*log(x) - (b*d^4*dilog(- c*x*1
i + 1)*1i)/2 + (b*d^4*dilog(c*x*1i + 1)*1i)/2 - 3*a*c^2*d^4*x^2 - (a*c^3*d^
4*x^3*4i)/3 + (a*c^4*d^4*x^4)/4 + a*c*d^4*x*4i + 3*b*c*d^4*x + (b*c^2*d^4*(
x^2/2 - log(c^2*x^2 + 1)/(2*c^2))*4i)/3 - 6*b*c^2*d^4*atan(c*x)*(1/(2*c^2)
+ x^2/2) - (b*c^3*d^4*x^3*atan(c*x)*4i)/3 + (b*c^4*d^4*x^4*atan(c*x))/4 + b
*c*d^4*x*atan(c*x)*4i)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x,x)
```

```
[Out] Timed out
```

3.36 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=190

$$\frac{1}{3}c^4d^4x^3\left(a+b\tan^{-1}(cx)\right)-2ic^3d^4x^2\left(a+b\tan^{-1}(cx)\right)-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{x}-6ac^2d^4x+4iacd^4\log(x)-\frac{1}{6}bc^3d^4x^2$$

```
[Out] -6*a*c^2*d^4*x+2*I*b*c^2*d^4*x-1/6*b*c^3*d^4*x^2-2*I*b*c*d^4*arctan(c*x)-6*
b*c^2*d^4*x*arctan(c*x)-d^4*(a+b*arctan(c*x))/x-2*I*c^3*d^4*x^2*(a+b*arctan
(c*x))+1/3*c^4*d^4*x^3*(a+b*arctan(c*x))+4*I*a*c*d^4*ln(x)+b*c*d^4*ln(x)+8/
3*b*c*d^4*ln(c^2*x^2+1)-2*b*c*d^4*polylog(2,-I*c*x)+2*b*c*d^4*polylog(2,I*c
*x)
```

Rubi [A] time = 0.21, antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {4876, 4846, 260, 4852, 266, 36, 29, 31, 4848, 2391, 321, 203, 43}

$$-2bcd^4\text{PolyLog}(2,-icx)+2bcd^4\text{PolyLog}(2,icx)+\frac{1}{3}c^4d^4x^3\left(a+b\tan^{-1}(cx)\right)-2ic^3d^4x^2\left(a+b\tan^{-1}(cx)\right)-\frac{d^4\left(a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -6*a*c^2*d^4*x + (2*I)*b*c^2*d^4*x - (b*c^3*d^4*x^2)/6 - (2*I)*b*c*d^4*ArcT
an[c*x] - 6*b*c^2*d^4*x*ArcTan[c*x] - (d^4*(a + b*ArcTan[c*x]))/x - (2*I)*c
^3*d^4*x^2*(a + b*ArcTan[c*x]) + (c^4*d^4*x^3*(a + b*ArcTan[c*x]))/3 + (4*I
)*a*c*d^4*Log[x] + b*c*d^4*Log[x] + (8*b*c*d^4*Log[1 + c^2*x^2])/3 - 2*b*c*
d^4*PolyLog[2, (-I)*c*x] + 2*b*c*d^4*PolyLog[2, I*c*x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^4 \left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx = \int \left(-6c^2d^4\left(a+b\tan^{-1}(cx)\right) + \frac{d^4\left(a+b\tan^{-1}(cx)\right)}{x^2} + \frac{4icd^4\left(a+b\tan^{-1}\right.}{x}\right.$$

$$= d^4 \int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx + \left(4icd^4\right)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx - \left(6c^2d^4\right)\int \left(a\right.$$

$$= -6ac^2d^4x - \frac{d^4\left(a+b\tan^{-1}(cx)\right)}{x} - 2ic^3d^4x^2\left(a+b\tan^{-1}(cx)\right) + \frac{1}{3}c^4d^4x^3$$

$$= -6ac^2d^4x + 2ibc^2d^4x - 6bc^2d^4x\tan^{-1}(cx) - \frac{d^4\left(a+b\tan^{-1}(cx)\right)}{x} - 2ic^3d$$

$$= -6ac^2d^4x + 2ibc^2d^4x - 2ibcd^4\tan^{-1}(cx) - 6bc^2d^4x\tan^{-1}(cx) - \frac{d^4\left(a+b\right.}{}$$

$$= -6ac^2d^4x + 2ibc^2d^4x - \frac{1}{6}bc^3d^4x^2 - 2ibcd^4\tan^{-1}(cx) - 6bc^2d^4x\tan^{-1}(cx$$

Mathematica [A] time = 0.15, size = 181, normalized size = 0.95

$$\frac{d^4\left(2ac^4x^4 - 12iac^3x^3 - 36ac^2x^2 + 24iacx\log(x) - 6a + 2bc^4x^4\tan^{-1}(cx) - bc^3x^3 - 12ibc^3x^3\tan^{-1}(cx) + 12ibc\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] (d^4*(-6*a - 36*a*c^2*x^2 + (12*I)*b*c^2*x^2 - (12*I)*a*c^3*x^3 - b*c^3*x^3
 + 2*a*c^4*x^4 - 6*b*ArcTan[c*x] - (12*I)*b*c*x*ArcTan[c*x] - 36*b*c^2*x^2*
ArcTan[c*x] - (12*I)*b*c^3*x^3*ArcTan[c*x] + 2*b*c^4*x^4*ArcTan[c*x] + (24*
I)*a*c*x*Log[x] + 6*b*c*x*Log[c*x] + 16*b*c*x*Log[1 + c^2*x^2] - 12*b*c*x*P
olyLog[2, (-I)*c*x] + 12*b*c*x*PolyLog[2, I*c*x]))/(6*x)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\,ac^4d^4x^4 - 8i\,ac^3d^4x^3 - 12\,ac^2d^4x^2 + 8i\,acd^4x + 2\,ad^4 + \left(i\,bc^4d^4x^4 + 4\,bc^3d^4x^3 - 6i\,bc^2d^4x^2 - 4\,bcd^4\right.}{2\,x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*a*c^4*d^4*x^4 - 8*I*a*c^3*d^4*x^3 - 12*a*c^2*d^4*x^2 + 8*I*
a*c*d^4*x + 2*a*d^4 + (I*b*c^4*d^4*x^4 + 4*b*c^3*d^4*x^3 - 6*I*b*c^2*d^4*x^
2 - 4*b*c*d^4*x + I*b*d^4)*log(-(c*x + I)/(c*x - I)))/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.06, size = 264, normalized size = 1.39

$$-6a\,c^2d^4x + \frac{d^4a\,c^4x^3}{3} + 2ib\,c^2d^4x - 2id^4a\,c^3x^2 - \frac{d^4a}{x} - 6b\,c^2d^4x\arctan(cx) + \frac{d^4b\arctan(cx)\,c^4x^3}{3} - 2ibc\,d^4\arctan(c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] -6*a*c^2*d^4*x+1/3*d^4*a*c^4*x^3+2*I*b*c^2*d^4*x-2*I*d^4*a*c^3*x^2-d^4*a/x-
6*b*c^2*d^4*x*arctan(c*x)+1/3*d^4*b*arctan(c*x)*c^4*x^3-2*I*b*c*d^4*arctan(
c*x)+4*I*c*d^4*b*arctan(c*x)*ln(c*x)-d^4*b*arctan(c*x)/x-2*c*d^4*b*ln(c*x)*
ln(1+I*c*x)+2*c*d^4*b*ln(c*x)*ln(1-I*c*x)-2*c*d^4*b*dilog(1+I*c*x)+2*c*d^4*
b*dilog(1-I*c*x)+4*I*c*d^4*a*ln(c*x)-1/6*b*c^3*d^4*x^2+c*d^4*b*ln(c*x)+8/3*
b*c*d^4*ln(c^2*x^2+1)-2*I*d^4*b*arctan(c*x)*c^3*x^2
```

maxima [A] time = 0.64, size = 241, normalized size = 1.27

$$\frac{1}{3}ac^4d^4x^3-2i\,ac^3d^4x^2-\frac{1}{6}bc^3d^4x^2-6\,ac^2d^4x+2i\,bc^2d^4x-\frac{1}{6}(6i\pi-1)bcd^4\log\left(c^2x^2+1\right)+4i\,bcd^4\arctan(cx)\log(cx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*c^4*d^4*x^3 - 2*I*a*c^3*d^4*x^2 - 1/6*b*c^3*d^4*x^2 - 6*a*c^2*d^4*x +
 2*I*b*c^2*d^4*x - 1/6*(6*I*pi - 1)*b*c*d^4*log(c^2*x^2 + 1) + 4*I*b*c*d^4*
arctan(c*x)*log(c*x) - 3*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*c*d^4 + 2
*b*c*d^4*dilog(I*c*x + 1) - 2*b*c*d^4*dilog(-I*c*x + 1) + 4*I*a*c*d^4*log(x
) - 1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d^4 - a*d^4/x
 + 1/6*(2*b*c^4*d^4*x^3 - 12*I*b*c^3*d^4*x^2 - 12*I*b*c*d^4)*arctan(c*x)
```

mupad [B] time = 0.82, size = 253, normalized size = 1.33

$$\begin{cases} \frac{a\,c^4\,d^4\,x^3}{3}-\frac{a\,d^4}{x}+\frac{b\,d^4\left(c^2\,\ln(x)-\frac{c^2\,\ln\left(c^2\,x^2+1\right)}{2}\right)}{c}+2\,b\,c\,d^4\,\left(\mathrm{Li}_2\left(1-c\,x\,1\mathrm{i}\right)-\mathrm{Li}_2\left(1+c\,x\,1\mathrm{i}\right)\right)+3\,b\,c\,d^4\,\ln\left(c^2\,x^2+1\right)-6\,a \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x^2,x)
```

```
[Out] piecewise(c == 0, -(a*d^4)/x, c ~= 0, - (a*d^4)/x - a*c^3*d^4*x^2*2i + (a*c
^4*d^4*x^3)/3 + (b*d^4*(c^2*log(x) - (c^2*log(c^2*x^2 + 1))/2))/c + 2*b*c*d
^4*(dilog(- c*x*1i + 1) - dilog(c*x*1i + 1)) + 3*b*c*d^4*log(c^2*x^2 + 1) -
 6*a*c^2*d^4*x + b*c^2*d^4*x*2i - (b*c^3*d^4*(x^2/2 - log(c^2*x^2 + 1)/(2*c
^2)))/3 + a*c*d^4*log(x)*4i - (b*d^4*atan(c*x))/x - 6*b*c^2*d^4*x*atan(c*x)
 - b*c^3*d^4*atan(c*x)*(1/(2*c^2) + x^2/2)*4i + (b*c^4*d^4*x^3*atan(c*x))/3
)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x**2,x)
```

```
[Out] Timed out
```

3.37 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=173

$$\frac{1}{2}c^4d^4x^2\left(a+b\tan^{-1}(cx)\right)-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{4icd^4\left(a+b\tan^{-1}(cx)\right)}{x}-4iac^3d^4x-6ac^2d^4\log(x)-\frac{1}{2}bc^3d^4x-4$$

[Out] -1/2*b*c*d^4/x-4*I*a*c^3*d^4*x-1/2*b*c^3*d^4*x-4*I*b*c^3*d^4*x*arctan(c*x)-1/2*d^4*(a+b*arctan(c*x))/x^2-4*I*c*d^4*(a+b*arctan(c*x))/x+1/2*c^4*d^4*x^2*(a+b*arctan(c*x))-6*a*c^2*d^4*ln(x)+4*I*b*c^2*d^4*ln(x)-3*I*b*c^2*d^4*polylog(2,-I*c*x)+3*I*b*c^2*d^4*polylog(2,I*c*x)

Rubi [A] time = 0.20, antiderivative size = 173, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {4876, 4846, 260, 4852, 325, 203, 266, 36, 29, 31, 4848, 2391, 321}

$$-3ibc^2d^4\text{PolyLog}(2,-icx)+3ibc^2d^4\text{PolyLog}(2,icx)+\frac{1}{2}c^4d^4x^2\left(a+b\tan^{-1}(cx)\right)-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{4icd^4\left(a\right.}{}$$

Antiderivative was successfully verified.

[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^3,x]

[Out] -(b*c*d^4)/(2*x) - (4*I)*a*c^3*d^4*x - (b*c^3*d^4*x)/2 - (4*I)*b*c^3*d^4*x*ArcTan[c*x] - (d^4*(a + b*ArcTan[c*x]))/(2*x^2) - ((4*I)*c*d^4*(a + b*ArcTan[c*x]))/x + (c^4*d^4*x^2*(a + b*ArcTan[c*x]))/2 - 6*a*c^2*d^4*Log[x] + (4*I)*b*c^2*d^4*Log[x] - (3*I)*b*c^2*d^4*PolyLog[2, (-I)*c*x] + (3*I)*b*c^2*d^4*PolyLog[2, I*c*x]

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveContent[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^4 \left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx = \int \left(-4ic^3d^4 \left(a+b\tan^{-1}(cx)\right) + \frac{d^4 \left(a+b\tan^{-1}(cx)\right)}{x^3} + \frac{4icd^4 \left(a+b\tan^{-1}\right.}{x^2}\right.$$

$$= d^4 \int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx + \left(4icd^4\right)\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx - \left(6c^2d^4\right)\int \frac{a}{}$$

$$= -4iac^3d^4x - \frac{d^4 \left(a+b\tan^{-1}(cx)\right)}{2x^2} - \frac{4icd^4 \left(a+b\tan^{-1}(cx)\right)}{x} + \frac{1}{2}c^4d^4x^2 \left(a\right.$$

$$= -\frac{bcd^4}{2x} - 4iac^3d^4x - \frac{1}{2}bc^3d^4x - 4ibc^3d^4x\tan^{-1}(cx) - \frac{d^4 \left(a+b\tan^{-1}(cx)\right)}{2x^2}$$

$$= -\frac{bcd^4}{2x} - 4iac^3d^4x - \frac{1}{2}bc^3d^4x - 4ibc^3d^4x\tan^{-1}(cx) - \frac{d^4 \left(a+b\tan^{-1}(cx)\right)}{2x^2}$$

$$= -\frac{bcd^4}{2x} - 4iac^3d^4x - \frac{1}{2}bc^3d^4x - 4ibc^3d^4x\tan^{-1}(cx) - \frac{d^4 \left(a+b\tan^{-1}(cx)\right)}{2x^2}$$

Mathematica [A] time = 0.15, size = 163, normalized size = 0.94

$$\frac{d^4 \left(ac^4x^4 - 8iac^3x^3 - 12ac^2x^2\log(x) - 8iacx - a + bc^4x^4\tan^{-1}(cx) - bc^3x^3 - 8ibc^3x^3\tan^{-1}(cx) - 6ibc^2x^2\text{Li}_2(-\right.}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] (d^4*(-a - (8*I)*a*c*x - b*c*x - (8*I)*a*c^3*x^3 - b*c^3*x^3 + a*c^4*x^4 -
b*ArcTan[c*x] - (8*I)*b*c*x*ArcTan[c*x] - (8*I)*b*c^3*x^3*ArcTan[c*x] + b*c
^4*x^4*ArcTan[c*x] - 12*a*c^2*x^2*Log[x] + (8*I)*b*c^2*x^2*Log[c*x] - (6*I)
*b*c^2*x^2*PolyLog[2, (-I)*c*x] + (6*I)*b*c^2*x^2*PolyLog[2, I*c*x]))/(2*x^
2)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\,ac^4d^4x^4 - 8i\,ac^3d^4x^3 - 12\,ac^2d^4x^2 + 8i\,acd^4x + 2\,ad^4 + \left(i\,bc^4d^4x^4 + 4\,bc^3d^4x^3 - 6i\,bc^2d^4x^2 - 4\,bcd^4\right.}{2\,x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*a*c^4*d^4*x^4 - 8*I*a*c^3*d^4*x^3 - 12*a*c^2*d^4*x^2 + 8*I*
a*c*d^4*x + 2*a*d^4 + (I*b*c^4*d^4*x^4 + 4*b*c^3*d^4*x^3 - 6*I*b*c^2*d^4*x^
2 - 4*b*c*d^4*x + I*b*d^4)*log(-(c*x + I)/(c*x - I)))/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 248, normalized size = 1.43

$$-4ib\,c^3d^4x\arctan(cx) + \frac{c^4d^4a\,x^2}{2} - 6c^2d^4a\ln(cx) - 4ia\,c^3d^4x - \frac{d^4a}{2x^2} - \frac{4ic\,d^4b\arctan(cx)}{x} + \frac{c^4d^4b\arctan(cx)\,x^2}{2} - 6c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] -4*I*b*c^3*d^4*x*arctan(c*x)+1/2*c^4*d^4*a*x^2-6*c^2*d^4*a*ln(c*x)-4*I*a*c^
3*d^4*x-1/2*d^4*a/x^2-4*I*c*d^4*b*arctan(c*x)/x+1/2*c^4*d^4*b*arctan(c*x)*x
^2-6*c^2*d^4*b*ln(c*x)*arctan(c*x)+4*I*c^2*d^4*b*ln(c*x)-1/2*d^4*b*arctan(c
*x)/x^2-1/2*b*c^3*d^4*x+3*I*c^2*d^4*b*ln(c*x)*ln(1-I*c*x)-1/2*b*c*d^4/x-3*I
*c^2*d^4*b*ln(c*x)*ln(1+I*c*x)+3*I*c^2*d^4*b*dilog(1-I*c*x)-4*I*c*d^4*a/x-3
*I*c^2*d^4*b*dilog(1+I*c*x)
```

maxima [A] time = 0.62, size = 251, normalized size = 1.45

$$\frac{1}{2}ac^4d^4x^2-4i\,ac^3d^4x-\frac{1}{2}bc^3d^4x+\frac{3}{2}\pi bc^2d^4\log\left(c^2x^2+1\right)-6\,bc^2d^4\arctan(cx)\log(cx)-2i\left(2\,cx\arctan(cx)-\log\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*c^4*d^4*x^2 - 4*I*a*c^3*d^4*x - 1/2*b*c^3*d^4*x + 3/2*pi*b*c^2*d^4*lo
g(c^2*x^2 + 1) - 6*b*c^2*d^4*arctan(c*x)*log(c*x) - 2*I*(2*c*x*arctan(c*x)
- log(c^2*x^2 + 1))*b*c^2*d^4 + 3*I*b*c^2*d^4*dilog(I*c*x + 1) - 3*I*b*c^2*
d^4*dilog(-I*c*x + 1) - 6*a*c^2*d^4*log(x) - 2*I*(c*(log(c^2*x^2 + 1) - log
(x^2)) + 2*arctan(c*x)/x)*b*c*d^4 - 1/2*((c*arctan(c*x) + 1/x)*c + arctan(c
*x)/x^2)*b*d^4 - 4*I*a*c*d^4/x - 1/2*a*d^4/x^2 + 1/2*(b*c^4*d^4*x^2 + b*c^2
*d^4)*arctan(c*x)
```

mupad [B] time = 0.89, size = 258, normalized size = 1.49

$$\begin{cases} \\ \frac{a\,c^4\,d^4\,x^2}{2}-\frac{\frac{a\,d^4}{2}+a\,c\,d^4\,x\,4\mathrm{i}}{x^2}-6\,a\,c^2\,d^4\,\ln(x)-\frac{b\,d^4\left(c^3\,\mathrm{atan}(c\,x)+\frac{c^2}{x}\right)}{2\,c}-\frac{b\,c^3\,d^4\,x}{2}-\frac{b\,d^4\,\mathrm{atan}(c\,x)}{2\,x^2}+b\,c^4\,d^4\,\mathrm{atan}(c\,x)\left(\frac{1}{2\,c^2}+\frac{x^2}{2}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x^3,x)
```

```
[Out] piecewise(c == 0, -(a*d^4)/(2*x^2), c ~= 0, - ((a*d^4)/2 + a*c*d^4*x*4i)/x^
2 + b*d^4*(c^2*log(x) - (c^2*log(c^2*x^2 + 1))/2)*4i + b*c^2*d^4*log(c^2*x^
2 + 1)*2i + (a*c^4*d^4*x^2)/2 - 6*a*c^2*d^4*log(x) + b*c^2*d^4*dilog(- c*x*
1i + 1)*3i - b*c^2*d^4*dilog(c*x*1i + 1)*3i - (b*d^4*(c^3*atan(c*x) + c^2/x
))/(2*c) - a*c^3*d^4*x*4i - (b*c^3*d^4*x)/2 - (b*d^4*atan(c*x))/(2*x^2) - (
b*c*d^4*atan(c*x)*4i)/x - b*c^3*d^4*x*atan(c*x)*4i + b*c^4*d^4*atan(c*x)*(1
/(2*c^2) + x^2/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x**3,x)
```

```
[Out] Timed out
```

3.38 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=201

$$\frac{6c^2d^4\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{2icd^4\left(a+b\tan^{-1}(cx)\right)}{x^2}+ac^4d^4x-4iac^3d^4\log(x)+bc^4d^4x\tan^{-1}($$

```
[Out] -1/6*b*c*d^4/x^2-2*I*b*c^2*d^4/x+a*c^4*d^4*x-2*I*b*c^3*d^4*arctan(c*x)+b*c^
4*d^4*x*arctan(c*x)-1/3*d^4*(a+b*arctan(c*x))/x^3-2*I*c*d^4*(a+b*arctan(c*x
))/x^2+6*c^2*d^4*(a+b*arctan(c*x))/x-4*I*a*c^3*d^4*ln(x)-19/3*b*c^3*d^4*ln(
x)+8/3*b*c^3*d^4*ln(c^2*x^2+1)+2*b*c^3*d^4*polylog(2,-I*c*x)-2*b*c^3*d^4*po
lylog(2,I*c*x)
```

Rubi [A] time = 0.22, antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {4876, 4846, 260, 4852, 266, 44, 325, 203, 36, 29, 31, 4848, 2391}

$$2bc^3d^4\text{PolyLog}(2,-icx)-2bc^3d^4\text{PolyLog}(2,icx)+\frac{6c^2d^4\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{2icd^4\left(a+b\tan^{-1}(cx)\right)}{x^2}-\frac{d^4\left(a+b\tan\right.}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*d^4)/(6*x^2) - ((2*I)*b*c^2*d^4)/x + a*c^4*d^4*x - (2*I)*b*c^3*d^4*Ar
cTan[c*x] + b*c^4*d^4*x*ArcTan[c*x] - (d^4*(a + b*ArcTan[c*x]))/(3*x^3) - (
(2*I)*c*d^4*(a + b*ArcTan[c*x]))/x^2 + (6*c^2*d^4*(a + b*ArcTan[c*x]))/x -
(4*I)*a*c^3*d^4*Log[x] - (19*b*c^3*d^4*Log[x])/3 + (8*b*c^3*d^4*Log[1 + c^2
*x^2])/3 + 2*b*c^3*d^4*PolyLog[2, (-I)*c*x] - 2*b*c^3*d^4*PolyLog[2, I*c*x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^4}dx = \int\left(c^4d^4\left(a+b\tan^{-1}(cx)\right)+\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{x^4}+\frac{4icd^4\left(a+b\tan^{-1}(cx\right.}{x^3}\right.$$
$$= d^4\int\frac{a+b\tan^{-1}(cx)}{x^4}dx+\left(4icd^4\right)\int\frac{a+b\tan^{-1}(cx)}{x^3}dx-\left(6c^2d^4\right)\int\frac{a}{}$$
$$= ac^4d^4x-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{2icd^4\left(a+b\tan^{-1}(cx)\right)}{x^2}+\frac{6c^2d^4\left(a+b\,\mathrm{ta}\right.}{x}$$
$$= -\frac{2ibc^2d^4}{x}+ac^4d^4x+bc^4d^4x\tan^{-1}(cx)-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{2icd^4\left(a\right.}{}$$
$$= -\frac{2ibc^2d^4}{x}+ac^4d^4x-2ibc^3d^4\tan^{-1}(cx)+bc^4d^4x\tan^{-1}(cx)-\frac{d^4\left(a+b\,\mathrm{ta}\right.}{3x^3}$$
$$= -\frac{bcd^4}{6x^2}-\frac{2ibc^2d^4}{x}+ac^4d^4x-2ibc^3d^4\tan^{-1}(cx)+bc^4d^4x\tan^{-1}(cx)-\frac{d^4(}{}$$

Mathematica [A] time = 0.16, size = 193, normalized size = 0.96

$$\frac{d^4\left(6ac^4x^4-24iac^3x^3\log(x)+36ac^2x^2-12iacx-2a+6bc^4x^4\tan^{-1}(cx)+12bc^3x^3\text{Li}_2(-icx)-12bc^3x^3\text{Li}_2(ic\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] (d^4*(-2*a - (12*I)*a*c*x - b*c*x + 36*a*c^2*x^2 - (12*I)*b*c^2*x^2 + 6*a*c
^4*x^4 - 2*b*ArcTan[c*x] - (12*I)*b*c*x*ArcTan[c*x] + 36*b*c^2*x^2*ArcTan[c
*x] - (12*I)*b*c^3*x^3*ArcTan[c*x] + 6*b*c^4*x^4*ArcTan[c*x] - (24*I)*a*c^3
*x^3*Log[x] - 38*b*c^3*x^3*Log[c*x] + 16*b*c^3*x^3*Log[1 + c^2*x^2] + 12*b*
c^3*x^3*PolyLog[2, (-I)*c*x] - 12*b*c^3*x^3*PolyLog[2, I*c*x]))/(6*x^3)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\,ac^4d^4x^4-8i\,ac^3d^4x^3-12\,ac^2d^4x^2+8i\,acd^4x+2\,ad^4+\left(i\,bc^4d^4x^4+4\,bc^3d^4x^3-6i\,bc^2d^4x^2-4\,bcd^4\right.}{2\,x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*a*c^4*d^4*x^4 - 8*I*a*c^3*d^4*x^3 - 12*a*c^2*d^4*x^2 + 8*I*
a*c*d^4*x + 2*a*d^4 + (I*b*c^4*d^4*x^4 + 4*b*c^3*d^4*x^3 - 6*I*b*c^2*d^4*x^
2 - 4*b*c*d^4*x + I*b*d^4)*log(-(c*x + I)/(c*x - I)))/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 277, normalized size = 1.38

$$a\,c^4d^4x-\frac{d^4a}{3x^3}-\frac{2ib\,c^2d^4}{x}+\frac{6c^2d^4a}{x}-4ic^3d^4a\ln(cx)+b\,c^4d^4x\arctan(cx)-\frac{d^4b\arctan(cx)}{3x^3}-2ib\,c^3d^4\arctan(cx)+\frac{6c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] a*c^4*d^4*x-1/3*d^4*a/x^3-2*I*b*c^2*d^4/x+6*c^2*d^4*a/x-4*I*c^3*d^4*a*ln(c*
x)+b*c^4*d^4*x*arctan(c*x)-1/3*d^4*b*arctan(c*x)/x^3-2*I*b*c^3*d^4*arctan(c
*x)+6*c^2*d^4*b*arctan(c*x)/x-2*I*c*d^4*a/x^2+2*c^3*d^4*b*ln(c*x)*ln(1+I*c*
x)-2*c^3*d^4*b*ln(c*x)*ln(1-I*c*x)+2*c^3*d^4*b*dilog(1+I*c*x)-2*c^3*d^4*b*d
ilog(1-I*c*x)-1/6*b*c*d^4/x^2-2*I*c*d^4*b*arctan(c*x)/x^2-19/3*c^3*d^4*b*ln
(c*x)+8/3*b*c^3*d^4*ln(c^2*x^2+1)-4*I*c^3*d^4*b*arctan(c*x)*ln(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$ac^4d^4x+\frac{1}{2}\left(2\,cx\arctan\left(cx\right)-\log\left(c^2x^2+1\right)\right)bc^3d^4-4i\,bc^3d^4\int\frac{\arctan\left(cx\right)}{x}\,dx-4i\,ac^3d^4\log(x)+3\left(c\left(\log\left(c^2x^2+1\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] a*c^4*d^4*x + 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*c^3*d^4 - 4*I*b*
c^3*d^4*integrate(arctan(c*x)/x, x) - 4*I*a*c^3*d^4*log(x) + 3*(c*(log(c^2*
x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c^2*d^4 - 2*I*((c*arctan(c*x) + 1
/x)*c + arctan(c*x)/x^2)*b*c*d^4 + 1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2
) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*d^4 + 6*a*c^2*d^4/x - 2*I*a*c*d^4/x^2 -
 1/3*a*d^4/x^3
```

mupad [B] time = 0.83, size = 261, normalized size = 1.30

$$\left\{\frac{b\,c^3\,d^4\,\ln\left(-\frac{3\,c^6\,x^2}{2}-\frac{3\,c^4}{2}\right)}{6}-\frac{b\,c^3\,d^4\,\ln\left(c^2\,x^2+1\right)}{2}-\frac{b\,c^3\,d^4\,\ln(x)}{3}-2\,b\,c^3\,d^4\,\left(\mathrm{Li}_2\left(1-c\,x\,1\mathrm{i}\right)-\mathrm{Li}_2\left(1+c\,x\,1\mathrm{i}\right)\right)-6\,b\,c\,d^4\,\left(c^2\,\ln(x\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x^4,x)
```

```
[Out] piecewise(c == 0, -(a*d^4)/(3*x^3), c ~= 0, - b*d^4*(c^3*atan(c*x) + c^2/x)
*2i - 2*b*c^3*d^4*(dilog(- c*x*1i + 1) - dilog(c*x*1i + 1)) - (b*c^3*d^4*lo
g(c^2*x^2 + 1))/2 - (b*c^3*d^4*log(x))/3 + (b*c^3*d^4*log(- (3*c^4)/2 - (3*
c^6*x^2)/2))/6 - 6*b*c*d^4*(c^2*log(x) - (c^2*log(c^2*x^2 + 1))/2) - (b*c*d
^4)/(6*x^2) - (a*d^4*(c*x*6i - 18*c^2*x^2 - 3*c^4*x^4 + c^3*x^3*log(x)*12i
+ 1))/(3*x^3) - (b*d^4*atan(c*x))/(3*x^3) - (b*c*d^4*atan(c*x)*2i)/x^2 + b*
c^4*d^4*x*atan(c*x) + (6*b*c^2*d^4*atan(c*x))/x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Timed out
```

3.39 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=227

$$\frac{4ic^3d^4\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{3c^2d^4\left(a+b\tan^{-1}(cx)\right)}{x^2}-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{4icd^4\left(a+b\tan^{-1}(cx)\right)}{3x^3}+ac^4d^4\log(x)$$

```
[Out] -1/12*b*c*d^4/x^3-2/3*I*b*c^2*d^4/x^2+13/4*b*c^3*d^4/x+13/4*b*c^4*d^4*arcta
n(c*x)-1/4*d^4*(a+b*arctan(c*x))/x^4-4/3*I*c*d^4*(a+b*arctan(c*x))/x^3+3*c^
2*d^4*(a+b*arctan(c*x))/x^2+4*I*c^3*d^4*(a+b*arctan(c*x))/x+a*c^4*d^4*ln(x)
-16/3*I*b*c^4*d^4*ln(x)+8/3*I*b*c^4*d^4*ln(c^2*x^2+1)+1/2*I*b*c^4*d^4*polyl
og(2,-I*c*x)-1/2*I*b*c^4*d^4*polylog(2,I*c*x)
```

Rubi [A] time = 0.23, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.478$, Rules used = {4876, 4852, 325, 203, 266, 44, 36, 29, 31, 4848, 2391}

$$\frac{1}{2}ibc^4d^4\text{PolyLog}(2,-icx)-\frac{1}{2}ibc^4d^4\text{PolyLog}(2,icx)+\frac{3c^2d^4\left(a+b\tan^{-1}(cx)\right)}{x^2}+\frac{4ic^3d^4\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{4icd^4\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(b*c*d^4)/(12*x^3) - (((2*I)/3)*b*c^2*d^4)/x^2 + (13*b*c^3*d^4)/(4*x) + (1
3*b*c^4*d^4*ArcTan[c*x])/4 - (d^4*(a + b*ArcTan[c*x]))/(4*x^4) - (((4*I)/3)
*c*d^4*(a + b*ArcTan[c*x]))/x^3 + (3*c^2*d^4*(a + b*ArcTan[c*x]))/x^2 + ((4
*I)*c^3*d^4*(a + b*ArcTan[c*x]))/x + a*c^4*d^4*Log[x] - ((16*I)/3)*b*c^4*d^
4*Log[x] + ((8*I)/3)*b*c^4*d^4*Log[1 + c^2*x^2] + (I/2)*b*c^4*d^4*PolyLog[2
, (-I)*c*x] - (I/2)*b*c^4*d^4*PolyLog[2, I*c*x]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx = \int \left(\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{x^5} + \frac{4icd^4\left(a+b\tan^{-1}(cx)\right)}{x^4} - \frac{6c^2d^4\left(a+b\tan^{-1}(cx)\right)}{x^3}\right.$$

$$= d^4\int \frac{a+b\tan^{-1}(cx)}{x^5}\,dx + \left(4icd^4\right)\int \frac{a+b\tan^{-1}(cx)}{x^4}\,dx - \left(6c^2d^4\right)\int \frac{a+b}{}$$

$$= -\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{4icd^4\left(a+b\tan^{-1}(cx)\right)}{3x^3} + \frac{3c^2d^4\left(a+b\tan^{-1}(cx)\right)}{x^2}$$

$$= -\frac{bcd^4}{12x^3} + \frac{3bc^3d^4}{x} - \frac{d^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{4icd^4\left(a+b\tan^{-1}(cx)\right)}{3x^3} + \frac{3c^2d^4\left(\right.}{}$$

$$= -\frac{bcd^4}{12x^3} + \frac{13bc^3d^4}{4x} + 3bc^4d^4\tan^{-1}(cx) - \frac{d^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{4icd^4\left(a+b\right.}{3x}$$

$$= -\frac{bcd^4}{12x^3} - \frac{2ibc^2d^4}{3x^2} + \frac{13bc^3d^4}{4x} + \frac{13}{4}bc^4d^4\tan^{-1}(cx) - \frac{d^4\left(a+b\tan^{-1}(cx)\right)}{4x^4} -$$

Mathematica [C] time = 0.13, size = 227, normalized size = 1.00

$$d^4\Big(12ac^4x^4\log(x)+48iac^3x^3+36ac^2x^2-16iacx-3a+6ibc^4x^4\text{Li}_2(-icx)-6ibc^4x^4\text{Li}_2(icx)-64ibc^4x^4\log(x$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] (d^4*(-3*a - (16*I)*a*c*x + 36*a*c^2*x^2 - (8*I)*b*c^2*x^2 + (48*I)*a*c^3*x
^3 - 3*b*ArcTan[c*x] - (16*I)*b*c*x*ArcTan[c*x] + 36*b*c^2*x^2*ArcTan[c*x]
+ (48*I)*b*c^3*x^3*ArcTan[c*x] - b*c*x*Hypergeometric2F1[-3/2, 1, -1/2, -(c
^2*x^2)] + 36*b*c^3*x^3*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)] + 12*a*
c^4*x^4*Log[x] - (64*I)*b*c^4*x^4*Log[x] + (32*I)*b*c^4*x^4*Log[1 + c^2*x^2
] + (6*I)*b*c^4*x^4*PolyLog[2, (-I)*c*x] - (6*I)*b*c^4*x^4*PolyLog[2, I*c*x
]))/(12*x^4)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{2\,ac^4d^4x^4-8i\,ac^3d^4x^3-12\,ac^2d^4x^2+8i\,acd^4x+2\,ad^4+\left(i\,bc^4d^4x^4+4\,bc^3d^4x^3-6i\,bc^2d^4x^2-4\,bcd^4\right.}{2\,x^5}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral(1/2*(2*a*c^4*d^4*x^4 - 8*I*a*c^3*d^4*x^3 - 12*a*c^2*d^4*x^2 + 8*I*
a*c*d^4*x + 2*a*d^4 + (I*b*c^4*d^4*x^4 + 4*b*c^3*d^4*x^3 - 6*I*b*c^2*d^4*x^
2 - 4*b*c*d^4*x + I*b*d^4)*log(-(c*x + I)/(c*x - I)))/x^5, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 298, normalized size = 1.31

$$\frac{4ic^3d^4b\arctan(cx)}{x}+c^4d^4a\ln(cx)-\frac{4ic\,d^4b\arctan(cx)}{3x^3}-\frac{d^4a}{4x^4}+\frac{3c^2d^4a}{x^2}-\frac{4ic\,d^4a}{3x^3}+c^4d^4b\ln(cx)\arctan(cx)+\frac{ic^4d^4}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] 4*I*c^3*d^4*b*arctan(c*x)/x+c^4*d^4*a*ln(c*x)-4/3*I*c*d^4*b*arctan(c*x)/x^3
-1/4*d^4*a/x^4+3*c^2*d^4*a/x^2-4/3*I*c*d^4*a/x^3+c^4*d^4*b*ln(c*x)*arctan(c
*x)-1/2*I*c^4*d^4*b*dilog(1-I*c*x)-1/4*d^4*b*arctan(c*x)/x^4+3*c^2*d^4*b*ar
ctan(c*x)/x^2+1/2*I*c^4*d^4*b*dilog(1+I*c*x)+4*I*c^3*d^4*a/x-1/12*b*c*d^4/x
^3+13/4*b*c^3*d^4/x-2/3*I*b*c^2*d^4/x^2+13/4*b*c^4*d^4*arctan(c*x)-16/3*I*c
^4*d^4*b*ln(c*x)+8/3*I*b*c^4*d^4*ln(c^2*x^2+1)+1/2*I*c^4*d^4*b*ln(c*x)*ln(1
+I*c*x)-1/2*I*c^4*d^4*b*ln(c*x)*ln(1-I*c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$bc^4d^4\int\frac{\arctan(cx)}{x}\,dx+ac^4d^4\log(x)+2i\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bc^3d^4+3\left(\left(c\arctan(c\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] b*c^4*d^4*integrate(arctan(c*x)/x, x) + a*c^4*d^4*log(x) + 2*I*(c*(log(c^2*
x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c^3*d^4 + 3*((c*arctan(c*x) + 1/x
)*c + arctan(c*x)/x^2)*b*c^2*d^4 + 2/3*I*((c^2*log(c^2*x^2 + 1) - c^2*log(x
^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*c*d^4 + 4*I*a*c^3*d^4/x + 1/12*((3*c^
3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*d^4 + 3*a*c^2
*d^4/x^2 - 4/3*I*a*c*d^4/x^3 - 1/4*a*d^4/x^4
```

mupad [B] time = 0.94, size = 298, normalized size = 1.31

$$\begin{cases} \\ 3\,b\,c\,d^4\,\left(c^3\,\mathrm{atan}\,(c\,x)+\frac{c^2}{x}\right)-\frac{b\,d^4\,\left(\frac{\frac{c^2}{3}-c^4\,x^2}{x^3}-c^5\,\mathrm{atan}(c\,x)\right)}{4\,c}-\frac{b\,c^4\,d^4\,\mathrm{Li}_2(1-c\,x\,1\mathrm{i})\,1\mathrm{i}}{2}+\frac{b\,c^4\,d^4\,\mathrm{Li}_2(1+c\,x\,1\mathrm{i})\,1\mathrm{i}}{2}-b\,c^2\,d^4\,\left(c^2\,\ln(x)-\right. \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x^5,x)
```

```
[Out] piecewise(c == 0, -(a*d^4)/(4*x^4), c ~= 0, - (b*d^4*(c^4*log(x) - (c^4*log
(- (c^4*(3*c^2*x^2 + 1))/2 - c^4))/2 + c^2/(2*x^2))*4i)/3 - (b*d^4*((c^2/3
- c^4*x^2)/x^3 - c^5*atan(c*x)))/(4*c) - (b*c^4*d^4*dilog(- c*x*1i + 1)*1i)
/2 + (b*c^4*d^4*dilog(c*x*1i + 1)*1i)/2 - b*c^2*d^4*(c^2*log(x) - (c^2*log(
c^2*x^2 + 1))/2)*4i + (a*d^4*(- c*x*16i + 36*c^2*x^2 + c^3*x^3*48i + 12*c^4
*x^4*log(x) - 3))/(12*x^4) - (b*d^4*atan(c*x))/(4*x^4) + 3*b*c*d^4*(c^3*ata
n(c*x) + c^2/x) - (b*c*d^4*atan(c*x)*4i)/(3*x^3) + (3*b*c^2*d^4*atan(c*x))/
x^2 + (b*c^3*d^4*atan(c*x)*4i)/x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x**5,x)
```

```
[Out] Timed out
```

3.40 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx$

Optimal. Leaf size=117

$$-\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{16}{5}bc^5d^4\log(x)-\frac{16}{5}bc^5d^4\log(cx+i)+\frac{3ibc^4d^4}{x}+\frac{11bc^3d^4}{10x^2}-\frac{ibc^2d^4}{3x^3}-\frac{bcd^4}{20x^4}$$

```
[Out] -1/20*b*c*d^4/x^4-1/3*I*b*c^2*d^4/x^3+11/10*b*c^3*d^4/x^2+3*I*b*c^4*d^4/x-1
/5*d^4*(1+I*c*x)^5*(a+b*arctan(c*x))/x^5+16/5*b*c^5*d^4*ln(x)-16/5*b*c^5*d^
4*ln(I+c*x)
```

Rubi [A] time = 0.10, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {37, 4872, 12, 88}

$$-\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5x^5}+\frac{11bc^3d^4}{10x^2}-\frac{ibc^2d^4}{3x^3}+\frac{3ibc^4d^4}{x}+\frac{16}{5}bc^5d^4\log(x)-\frac{16}{5}bc^5d^4\log(cx+i)-\frac{bcd^4}{20x^4}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -(b*c*d^4)/(20*x^4) - ((I/3)*b*c^2*d^4)/x^3 + (11*b*c^3*d^4)/(10*x^2) + ((3
*I)*b*c^4*d^4)/x - (d^4*(1 + I*c*x)^5*(a + b*ArcTan[c*x]))/(5*x^5) + (16*b*
c^5*d^4*Log[x])/5 - (16*b*c^5*d^4*Log[I + c*x])/5
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 88

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x
_))^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*
x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && IntegersQ[m, n] && (Inte
gerQ[p] || (GtQ[m, 0] && GeQ[n, -1]))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx = -\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5x^5} - (bc)\int -\frac{id^4(i-cx)^4}{5x^5(i+cx)}\,dx$$
$$= -\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5x^5} + \frac{1}{5}\left(ibcd^4\right)\int \frac{(i-cx)^4}{x^5(i+cx)}\,dx$$
$$= -\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5x^5} + \frac{1}{5}\left(ibcd^4\right)\int\left(-\frac{i}{x^5}+\frac{5c}{x^4}+\frac{11ic^2}{x^3}-\frac{15c^3}{x^2} -$$
$$= -\frac{bcd^4}{20x^4} - \frac{ibc^2d^4}{3x^3} + \frac{11bc^3d^4}{10x^2} + \frac{3ibc^4d^4}{x} - \frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{5x^5} + \frac{16}{5}$$

Mathematica [C] time = 0.17, size = 191, normalized size = 1.63

$$-\frac{d^4\left(3\left(20ac^4x^4-40iac^3x^3-40ac^2x^2+20iacx+4a-64bc^5x^5\log(x)-22bc^3x^3+32bc^5x^5\log\left(c^2x^2+1\right)-40ib\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -1/60*(d^4*((20*I)*b*c^2*x^2*Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)] +
 3*(4*a + (20*I)*a*c*x + b*c*x - 40*a*c^2*x^2 - (40*I)*a*c^3*x^3 - 22*b*c^3
*x^3 + 20*a*c^4*x^4 + 4*b*(1 + (5*I)*c*x - 10*c^2*x^2 - (10*I)*c^3*x^3 + 5*
c^4*x^4)*ArcTan[c*x] - (40*I)*b*c^4*x^4*Hypergeometric2F1[-1/2, 1, 1/2, -(c
^2*x^2)] - 64*b*c^5*x^5*Log[x] + 32*b*c^5*x^5*Log[1 + c^2*x^2])))/x^5
```

fricas [B] time = 0.51, size = 201, normalized size = 1.72

$$\frac{192\,bc^5d^4x^5\log(x) - 186\,bc^5d^4x^5\log\left(\frac{cx+i}{c}\right) - 6\,bc^5d^4x^5\log\left(\frac{cx-i}{c}\right) - 60\,(a-3i\,b)c^4d^4x^4 + (120i\,a+66\,b)c^3d^4x^3 +}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] 1/60*(192*b*c^5*d^4*x^5*log(x) - 186*b*c^5*d^4*x^5*log((c*x + I)/c) - 6*b*c
^5*d^4*x^5*log((c*x - I)/c) - 60*(a - 3*I*b)*c^4*d^4*x^4 + (120*I*a + 66*b)
*c^3*d^4*x^3 + 20*(6*a - I*b)*c^2*d^4*x^2 + (-60*I*a - 3*b)*c*d^4*x - 12*a*
d^4 + (-30*I*b*c^4*d^4*x^4 - 60*b*c^3*d^4*x^3 + 60*I*b*c^2*d^4*x^2 + 30*b*c
*d^4*x - 6*I*b*d^4)*log(-(c*x + I)/(c*x - I)))/x^5
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.05, size = 230, normalized size = 1.97

$$\frac{2c^2d^4a}{x^3}-\frac{c^4d^4a}{x}+\frac{3ib\,c^4d^4}{x}-\frac{d^4a}{5x^5}+\frac{2ic^3d^4a}{x^2}+\frac{2c^2d^4b\arctan(cx)}{x^3}-\frac{c^4d^4b\arctan(cx)}{x}-\frac{ib\,c^2d^4}{3x^3}-\frac{d^4b\arctan(cx)}{5x^5}+3ic^5d^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^6,x)
```

```
[Out] 2*c^2*d^4*a/x^3-c^4*d^4*a/x+3*I*b*c^4*d^4/x-1/5*d^4*a/x^5+2*I*c^3*d^4*a/x^2
+2*c^2*d^4*b*arctan(c*x)/x^3-c^4*d^4*b*arctan(c*x)/x-1/3*I*b*c^2*d^4/x^3-1/
5*d^4*b*arctan(c*x)/x^5+3*I*c^5*d^4*b*arctan(c*x)-I*c*d^4*a/x^4+2*I*c^3*d^4
*b*arctan(c*x)/x^2-1/20*b*c*d^4/x^4+11/10*b*c^3*d^4/x^2+16/5*c^5*d^4*b*ln(c
*x)-8/5*c^5*d^4*b*ln(c^2*x^2+1)-I*c*d^4*b*arctan(c*x)/x^4
```

maxima [B] time = 0.43, size = 275, normalized size = 2.35

$$-\frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan\left(cx\right)}{x}\right)bc^4d^4+2i\left(\left(c\arctan\left(cx\right)+\frac{1}{x}\right)c+\frac{\arctan\left(cx\right)}{x^2}\right)bc^3d^4-\left(\left(c^2\,\mathrm{lo}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*c^4*d^4 + 2*I*((
c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*c^3*d^4 - ((c^2*log(c^2*x^2 + 1
) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*c^2*d^4 - a*c^4*d^4/x +
1/3*I*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*c
*d^4 - 1/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4
)*c + 4*arctan(c*x)/x^5)*b*d^4 + 2*I*a*c^3*d^4/x^2 + 2*a*c^2*d^4/x^3 - I*a*
c*d^4/x^4 - 1/5*a*d^4/x^5
```

mupad [B] time = 0.73, size = 186, normalized size = 1.59

$$\frac{d^4\,\left(192\,b\,c^5\,\ln(x)-96\,b\,c^5\,\ln\left(c^2\,x^2+1\right)+b\,c^5\,\mathrm{atan}\left(c\,x\right)\,180\mathrm{i}\right)}{60}-\frac{\frac{d^4\,\left(12\,a+12\,b\,\mathrm{atan}(c\,x)\right)}{60}+\frac{d^4\,x\,\left(a\,c\,60\mathrm{i}+3\,b\,c+b\,c\,\mathrm{atan}(c\,x)\,6\right.}{60}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x^6,x)
```

```
[Out] (d^4*(b*c^5*atan(c*x)*180i - 96*b*c^5*log(c^2*x^2 + 1) + 192*b*c^5*log(x)))
/60 - ((d^4*(12*a + 12*b*atan(c*x)))/60 + (d^4*x*(a*c*60i + 3*b*c + b*c*ata
n(c*x)*60i))/60 - (d^4*x^2*(120*a*c^2 - b*c^2*20i + 120*b*c^2*atan(c*x)))/6
0 + (d^4*x^4*(60*a*c^4 - b*c^4*180i + 60*b*c^4*atan(c*x)))/60 - (d^4*x^3*(a
*c^3*120i + 66*b*c^3 + b*c^3*atan(c*x)*120i))/60)/x^5
```

sympy [B] time = 71.85, size = 366, normalized size = 3.13

$$\frac{16bc^5d^4\log\left(10395b^2c^{11}d^8x\right)}{5}-\frac{bc^5d^4\log\left(10395b^2c^{11}d^8x-10395ib^2c^{10}d^8\right)}{10}-\frac{31bc^5d^4\log\left(10395b^2c^{11}d^8x+10\right.}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x**6,x)
```

```
[Out] 16*b*c**5*d**4*log(10395*b**2*c**11*d**8*x)/5 - b*c**5*d**4*log(10395*b**2*
c**11*d**8*x - 10395*I*b**2*c**10*d**8)/10 - 31*b*c**5*d**4*log(10395*b**2*
c**11*d**8*x + 10395*I*b**2*c**10*d**8)/10 + (-12*a*d**4 + x**4*(-60*a*c**4
*d**4 + 180*I*b*c**4*d**4) + x**3*(120*I*a*c**3*d**4 + 66*b*c**3*d**4) + x*
*2*(120*a*c**2*d**4 - 20*I*b*c**2*d**4) + x*(-60*I*a*c*d**4 - 3*b*c*d**4))/
(60*x**5) + (-5*I*b*c**4*d**4*x**4 - 10*b*c**3*d**4*x**3 + 10*I*b*c**2*d**4
*x**2 + 5*b*c*d**4*x - I*b*d**4)*log(-I*c*x + 1)/(10*x**5) + (5*I*b*c**4*d*
*4*x**4 + 10*b*c**3*d**4*x**3 - 10*I*b*c**2*d**4*x**2 - 5*b*c*d**4*x + I*b*
d**4)*log(I*c*x + 1)/(10*x**5)
```

3.41 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^7}\,dx$

Optimal. Leaf size=168

$$-\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{6x^6}+\frac{icd^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{30x^5}+\frac{32}{15}ibc^6d^4\log(x)-\frac{32}{15}ibc^6d^4\log(cx+i)-\frac{13bc^5d^4}{6x}$$

```
[Out] -1/30*b*c*d^4/x^5-1/5*I*b*c^2*d^4/x^4+5/9*b*c^3*d^4/x^3+16/15*I*b*c^4*d^4/x
^2-13/6*b*c^5*d^4/x-1/6*d^4*(1+I*c*x)^5*(a+b*arctan(c*x))/x^6+1/30*I*c*d^4*
(1+I*c*x)^5*(a+b*arctan(c*x))/x^5+32/15*I*b*c^6*d^4*ln(x)-32/15*I*b*c^6*d^4
*ln(I+c*x)
```

Rubi [A] time = 0.11, antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {45, 37, 4872, 12, 148}

$$\frac{icd^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{30x^5}-\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{6x^6}+\frac{16ibc^4d^4}{15x^2}+\frac{5bc^3d^4}{9x^3}-\frac{ibc^2d^4}{5x^4}-\frac{13bc^5d^4}{6x}+\frac{32}{15}ibc^6d^4\,\mathrm{lo}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -(b*c*d^4)/(30*x^5) - ((I/5)*b*c^2*d^4)/x^4 + (5*b*c^3*d^4)/(9*x^3) + (((16
*I)/15)*b*c^4*d^4)/x^2 - (13*b*c^5*d^4)/(6*x) - (d^4*(1 + I*c*x)^5*(a + b*A
rcTan[c*x]))/(6*x^6) + ((I/30)*c*d^4*(1 + I*c*x)^5*(a + b*ArcTan[c*x]))/x^5
 + ((32*I)/15)*b*c^6*d^4*Log[x] - ((32*I)/15)*b*c^6*d^4*Log[I + c*x]
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 148

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_)
)^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(
c + d*x)^n*(e + f*x)^p*(g + h*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h,
m}, x] && (IntegersQ[m, n, p] || (IGtQ[n, 0] && IGtQ[p, 0]))
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^7}\,dx = -\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{6x^6}+\frac{icd^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{30x^5}-(bc)$$

$$= -\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{6x^6}+\frac{icd^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{30x^5}-\frac{1}{30}$$

$$= -\frac{d^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{6x^6}+\frac{icd^4(1+icx)^5\left(a+b\tan^{-1}(cx)\right)}{30x^5}-\frac{1}{30}$$

$$= -\frac{bcd^4}{30x^5}-\frac{ibc^2d^4}{5x^4}+\frac{5bc^3d^4}{9x^3}+\frac{16ibc^4d^4}{15x^2}-\frac{13bc^5d^4}{6x}-\frac{d^4(1+icx)^5\left(a+b\,\mathrm{ta}\right.}{6x^6}$$

Mathematica [C] time = 0.13, size = 235, normalized size = 1.40

$$-\frac{d^4\left(15ac^4x^4-40iac^3x^3-45ac^2x^2+24iacx+5a-64ibc^6x^6\log(x)-32ibc^4x^4+15bc^4x^4\tan^{-1}(cx)-40ibc^3x\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -1/30*(d^4*(5*a + (24*I)*a*c*x - 45*a*c^2*x^2 + (6*I)*b*c^2*x^2 - (40*I)*a*
c^3*x^3 + 15*a*c^4*x^4 - (32*I)*b*c^4*x^4 + 5*b*ArcTan[c*x] + (24*I)*b*c*x*
ArcTan[c*x] - 45*b*c^2*x^2*ArcTan[c*x] - (40*I)*b*c^3*x^3*ArcTan[c*x] + 15*
b*c^4*x^4*ArcTan[c*x] + b*c*x*Hypergeometric2F1[-5/2, 1, -3/2, -(c^2*x^2)]
- 15*b*c^3*x^3*Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)] + 15*b*c^5*x^5*
Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)] - (64*I)*b*c^6*x^6*Log[x] + (32
*I)*b*c^6*x^6*Log[1 + c^2*x^2]))/x^6
```

fricas [A] time = 0.46, size = 215, normalized size = 1.28

$$\frac{384i\,bc^6d^4x^6\log(x)-387i\,bc^6d^4x^6\log\left(\frac{cx+i}{c}\right)+3i\,bc^6d^4x^6\log\left(\frac{cx-i}{c}\right)-390\,bc^5d^4x^5-6\,(15\,a-32i\,b)c^4d^4x^4+(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^7,x, algorithm="fricas")
```

```
[Out] 1/180*(384*I*b*c^6*d^4*x^6*log(x) - 387*I*b*c^6*d^4*x^6*log((c*x + I)/c) +
3*I*b*c^6*d^4*x^6*log((c*x - I)/c) - 390*b*c^5*d^4*x^5 - 6*(15*a - 32*I*b)*
c^4*d^4*x^4 + (240*I*a + 100*b)*c^3*d^4*x^3 + 18*(15*a - 2*I*b)*c^2*d^4*x^2
 + (-144*I*a - 6*b)*c*d^4*x - 30*a*d^4 + (-45*I*b*c^4*d^4*x^4 - 120*b*c^3*d
^4*x^3 + 135*I*b*c^2*d^4*x^2 + 72*b*c*d^4*x - 15*I*b*d^4)*log(-(c*x + I)/(c
*x - I)))/x^6
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^7,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 243, normalized size = 1.45

$$\frac{4ic^3d^4a}{3x^3}+\frac{3c^2d^4a}{2x^4}-\frac{4ic\,d^4b\arctan(cx)}{5x^5}-\frac{c^4d^4a}{2x^2}-\frac{d^4a}{6x^6}-\frac{4ic\,d^4a}{5x^5}+\frac{3c^2d^4b\arctan(cx)}{2x^4}+\frac{4ic^3d^4b\arctan(cx)}{3x^3}-\frac{c^4d^4b\arctan(cx)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^7,x)
```

```
[Out] 4/3*I*c^3*d^4*a/x^3+3/2*c^2*d^4*a/x^4-4/5*I*c*d^4*b*arctan(c*x)/x^5-1/2*c^4
*d^4*a/x^2-1/6*d^4*a/x^6-4/5*I*c*d^4*a/x^5+3/2*c^2*d^4*b*arctan(c*x)/x^4+4/
3*I*c^3*d^4*b*arctan(c*x)/x^3-1/2*c^4*d^4*b*arctan(c*x)/x^2-1/6*d^4*b*arcta
n(c*x)/x^6+16/15*I*b*c^4*d^4/x^2-16/15*I*c^6*d^4*b*ln(c^2*x^2+1)-1/5*I*b*c^
2*d^4/x^4-1/30*b*c*d^4/x^5+5/9*b*c^3*d^4/x^3-13/6*b*c^5*d^4/x+32/15*I*c^6*d
^4*b*ln(c*x)-13/6*c^6*d^4*b*arctan(c*x)
```

maxima [B] time = 0.42, size = 290, normalized size = 1.73

$$-\frac{1}{2}\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bc^4d^4-\frac{2}{3}i\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bc^3d^4$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^7,x, algorithm="maxima")
```

```
[Out] -1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*c^4*d^4 - 2/3*I*((c^2*lo
g(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*c^3*d^4 - 1
/2*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*c^2*
d^4 - 1/5*I*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4
)*c + 4*arctan(c*x)/x^5)*b*c*d^4 - 1/2*a*c^4*d^4/x^2 - 1/90*((15*c^5*arctan
(c*x) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arctan(c*x)/x^6)*b*d^4 + 4
/3*I*a*c^3*d^4/x^3 + 3/2*a*c^2*d^4/x^4 - 4/5*I*a*c*d^4/x^5 - 1/6*a*d^4/x^6
```

mupad [B] time = 0.90, size = 208, normalized size = 1.24

$$-\frac{d^4\left(195\,b\,c^5\,\mathrm{atan}\left(x\,\sqrt{c^2}\right)\,\sqrt{c^2}\,+b\,c^6\,\ln\left(c^2\,x^2+1\right)\,96\mathrm{i}-b\,c^6\,\ln(x)\,192\mathrm{i}\right)}{90}-\frac{\frac{d^4\,(15\,a+15\,b\,\mathrm{atan}(c\,x))}{90}+\frac{d^4\,x\,(a\,c\,72\mathrm{i}+3\,b\,c+b}{90}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x^7,x)
```

```
[Out] - (d^4*(b*c^6*log(c^2*x^2 + 1)*96i - b*c^6*log(x)*192i + 195*b*c^5*atan(x*(
c^2)^(1/2))*(c^2)^(1/2)))/90 - ((d^4*(15*a + 15*b*atan(c*x)))/90 + (d^4*x*(
a*c*72i + 3*b*c + b*c*atan(c*x)*72i))/90 + (d^4*x^4*(45*a*c^4 - b*c^4*96i +
 45*b*c^4*atan(c*x)))/90 - (d^4*x^2*(135*a*c^2 - b*c^2*18i + 135*b*c^2*atan
(c*x)))/90 - (d^4*x^3*(a*c^3*120i + 50*b*c^3 + b*c^3*atan(c*x)*120i))/90 +
(13*b*c^5*d^4*x^5)/6)/x^6
```

sympy [B] time = 138.24, size = 388, normalized size = 2.31

$$\frac{32ibc^6d^4\log\left(2121535b^2c^{13}d^8x\right)}{15}+\frac{ibc^6d^4\log\left(2121535b^2c^{13}d^8x-2121535ib^2c^{12}d^8\right)}{60}-\frac{43ibc^6d^4\log\left(2121535b^2c^{13}\right.}{20}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x**7,x)
```

```
[Out] 32*I*b*c**6*d**4*log(2121535*b**2*c**13*d**8*x)/15 + I*b*c**6*d**4*log(2121
535*b**2*c**13*d**8*x - 2121535*I*b**2*c**12*d**8)/60 - 43*I*b*c**6*d**4*lo
g(2121535*b**2*c**13*d**8*x + 2121535*I*b**2*c**12*d**8)/20 + (-15*I*b*c**4
*d**4*x**4 - 40*b*c**3*d**4*x**3 + 45*I*b*c**2*d**4*x**2 + 24*b*c*d**4*x -
5*I*b*d**4)*log(-I*c*x + 1)/(60*x**6) + (15*I*b*c**4*d**4*x**4 + 40*b*c**3*
d**4*x**3 - 45*I*b*c**2*d**4*x**2 - 24*b*c*d**4*x + 5*I*b*d**4)*log(I*c*x +
 1)/(60*x**6) + (-15*a*d**4 - 195*b*c**5*d**4*x**5 + x**4*(-45*a*c**4*d**4
+ 96*I*b*c**4*d**4) + x**3*(120*I*a*c**3*d**4 + 50*b*c**3*d**4) + x**2*(135
*a*c**2*d**4 - 18*I*b*c**2*d**4) + x*(-72*I*a*c*d**4 - 3*b*c*d**4))/(90*x**
6)
```

3.42 $\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^8}\,dx$

Optimal. Leaf size=243

$$-\frac{c^4d^4\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{ic^3d^4\left(a+b\tan^{-1}(cx)\right)}{x^4}+\frac{6c^2d^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{7x^7}-\frac{2icd^4\left(a+b\tan\right.}{3x^6}$$

```
[Out] -1/42*b*c*d^4/x^6-2/15*I*b*c^2*d^4/x^5+47/140*b*c^3*d^4/x^4+5/9*I*b*c^4*d^4
/x^3-88/105*b*c^5*d^4/x^2-5/3*I*b*c^6*d^4/x-1/7*d^4*(a+b*arctan(c*x))/x^7-2
/3*I*c*d^4*(a+b*arctan(c*x))/x^6+6/5*c^2*d^4*(a+b*arctan(c*x))/x^5+I*c^3*d^
4*(a+b*arctan(c*x))/x^4-1/3*c^4*d^4*(a+b*arctan(c*x))/x^3-176/105*b*c^7*d^4
*ln(x)+1/210*b*c^7*d^4*ln(I-c*x)+117/70*b*c^7*d^4*ln(I+c*x)
```

Rubi [A] time = 0.20, antiderivative size = 243, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {43, 4872, 12, 1802}

$$-\frac{c^4d^4\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{ic^3d^4\left(a+b\tan^{-1}(cx)\right)}{x^4}+\frac{6c^2d^4\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2icd^4\left(a+b\tan^{-1}(cx)\right)}{3x^6}-\frac{d^4\left(a+b\tan\right.}{7x^7}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^8,x]
```

```
[Out] -(b*c*d^4)/(42*x^6) - (((2*I)/15)*b*c^2*d^4)/x^5 + (47*b*c^3*d^4)/(140*x^4)
 + (((5*I)/9)*b*c^4*d^4)/x^3 - (88*b*c^5*d^4)/(105*x^2) - (((5*I)/3)*b*c^6*
d^4)/x - (d^4*(a + b*ArcTan[c*x]))/(7*x^7) - (((2*I)/3)*c*d^4*(a + b*ArcTan
[c*x]))/x^6 + (6*c^2*d^4*(a + b*ArcTan[c*x]))/(5*x^5) + (I*c^3*d^4*(a + b*A
rcTan[c*x]))/x^4 - (c^4*d^4*(a + b*ArcTan[c*x]))/(3*x^3) - (176*b*c^7*d^4*L
og[x])/105 + (b*c^7*d^4*Log[I - c*x])/210 + (117*b*c^7*d^4*Log[I + c*x])/70
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{x^8}\,dx = -\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{7x^7} - \frac{2icd^4\left(a+b\tan^{-1}(cx)\right)}{3x^6} + \frac{6c^2d^4\left(a+b\tan^{-1}(cx\right.}{5x^5}$$

$$= -\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{7x^7} - \frac{2icd^4\left(a+b\tan^{-1}(cx)\right)}{3x^6} + \frac{6c^2d^4\left(a+b\tan^{-1}(cx\right.}{5x^5}$$

$$= -\frac{d^4\left(a+b\tan^{-1}(cx)\right)}{7x^7} - \frac{2icd^4\left(a+b\tan^{-1}(cx)\right)}{3x^6} + \frac{6c^2d^4\left(a+b\tan^{-1}(cx\right.}{5x^5}$$

$$= -\frac{bcd^4}{42x^6} - \frac{2ibc^2d^4}{15x^5} + \frac{47bc^3d^4}{140x^4} + \frac{5ibc^4d^4}{9x^3} - \frac{88bc^5d^4}{105x^2} - \frac{5ibc^6d^4}{3x} - \frac{d^4\left(a+b\right.}{7}$$

Mathematica [C] time = 0.11, size = 293, normalized size = 1.21

$$-\frac{ac^4d^4}{3x^3}+\frac{iac^3d^4}{x^4}+\frac{6ac^2d^4}{5x^5}-\frac{2iacd^4}{3x^6}-\frac{ad^4}{7x^7}-\frac{176}{105}bc^7d^4\log(x)-\frac{88bc^5d^4}{105x^2}-\frac{bc^4d^4\tan^{-1}(cx)}{3x^3}+\frac{47bc^3d^4}{140x^4}+\frac{ibc^3d^4\tan^{-1}(c}{x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + I*c*d*x)^4*(a + b*ArcTan[c*x]))/x^8,x]
```

```
[Out] -1/7*(a*d^4)/x^7 - (((2*I)/3)*a*c*d^4)/x^6 - (b*c*d^4)/(42*x^6) + (6*a*c^2*
d^4)/(5*x^5) + (I*a*c^3*d^4)/x^4 + (47*b*c^3*d^4)/(140*x^4) - (a*c^4*d^4)/(
3*x^3) - (88*b*c^5*d^4)/(105*x^2) - (b*d^4*ArcTan[c*x])/(7*x^7) - (((2*I)/3
)*b*c*d^4*ArcTan[c*x])/x^6 + (6*b*c^2*d^4*ArcTan[c*x])/(5*x^5) + (I*b*c^3*d
^4*ArcTan[c*x])/x^4 - (b*c^4*d^4*ArcTan[c*x])/(3*x^3) - (((2*I)/15)*b*c^2*d
^4*Hypergeometric2F1[-5/2, 1, -3/2, -(c^2*x^2)])/x^5 + ((I/3)*b*c^4*d^4*Hyp
ergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)])/x^3 - (176*b*c^7*d^4*Log[x])/105
 + (88*b*c^7*d^4*Log[1 + c^2*x^2])/105
```

fricas [A] time = 0.54, size = 230, normalized size = 0.95

$$-\frac{2112\,bc^7d^4x^7\log(x) - 2106\,bc^7d^4x^7\log\left(\frac{cx+i}{c}\right) - 6\,bc^7d^4x^7\log\left(\frac{cx-i}{c}\right) + 2100i\,bc^6d^4x^6 + 1056\,bc^5d^4x^5 + 140\,(3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] -1/1260*(2112*b*c^7*d^4*x^7*log(x) - 2106*b*c^7*d^4*x^7*log((c*x + I)/c) -
6*b*c^7*d^4*x^7*log((c*x - I)/c) + 2100*I*b*c^6*d^4*x^6 + 1056*b*c^5*d^4*x^
5 + 140*(3*a - 5*I*b)*c^4*d^4*x^4 - (1260*I*a + 423*b)*c^3*d^4*x^3 - 168*(9
*a - I*b)*c^2*d^4*x^2 - (-840*I*a - 30*b)*c*d^4*x + 180*a*d^4 - (-210*I*b*c
^4*d^4*x^4 - 630*b*c^3*d^4*x^3 + 756*I*b*c^2*d^4*x^2 + 420*b*c*d^4*x - 90*I
*b*d^4)*log(-(c*x + I)/(c*x - I)))/x^7
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 255, normalized size = 1.05

$$-\frac{d^4a}{7x^7}-\frac{c^4d^4a}{3x^3}+\frac{ic^3d^4b\arctan(cx)}{x^4}+\frac{6c^2d^4a}{5x^5}-\frac{5ic^7d^4b\arctan(cx)}{3}-\frac{d^4b\arctan(cx)}{7x^7}-\frac{c^4d^4b\arctan(cx)}{3x^3}+\frac{ic^3d^4a}{x^4}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^8,x)
```

```
[Out] -1/7*d^4*a/x^7-1/3*c^4*d^4*a/x^3+I*c^3*d^4*b*arctan(c*x)/x^4+6/5*c^2*d^4*a/
x^5-5/3*I*c^7*d^4*b*arctan(c*x)-1/7*d^4*b*arctan(c*x)/x^7-1/3*c^4*d^4*b*arc
tan(c*x)/x^3+I*c^3*d^4*a/x^4+6/5*c^2*d^4*b*arctan(c*x)/x^5-2/3*I*c*d^4*b*ar
ctan(c*x)/x^6+5/9*I*b*c^4*d^4/x^3-2/3*I*c*d^4*a/x^6-2/15*I*b*c^2*d^4/x^5-1/
42*b*c*d^4/x^6+47/140*b*c^3*d^4/x^4-88/105*b*c^5*d^4/x^2-176/105*c^7*d^4*b*
ln(c*x)+88/105*c^7*d^4*b*ln(c^2*x^2+1)-5/3*I*b*c^6*d^4/x
```

maxima [A] time = 0.41, size = 329, normalized size = 1.35

$$\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bc^4d^4-\frac{1}{3}i\left(\left(3c^3\arctan(cx)+\frac{3c^2x^2-1}{x^3}\right)c-\frac{3\arctan}{x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^4*(a+b*arctan(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] 1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b
*c^4*d^4 - 1/3*I*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*
x)/x^4)*b*c^3*d^4 + 3/10*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2
*x^2 - 1)/x^4)*c + 4*arctan(c*x)/x^5)*b*c^2*d^4 - 2/45*I*((15*c^5*arctan(c*
x) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arctan(c*x)/x^6)*b*c*d^4 + 1/
84*((6*c^6*log(c^2*x^2 + 1) - 6*c^6*log(x^2) - (6*c^4*x^4 - 3*c^2*x^2 + 2)/
x^6)*c - 12*arctan(c*x)/x^7)*b*d^4 - 1/3*a*c^4*d^4/x^3 + I*a*c^3*d^4/x^4 +
6/5*a*c^2*d^4/x^5 - 2/3*I*a*c*d^4/x^6 - 1/7*a*d^4/x^7
```

mupad [B] time = 1.17, size = 317, normalized size = 1.30

$$\frac{88\,b\,c^7\,d^4\,\ln\left(c^2\,x^2+1\right)}{105}-\frac{\frac{a\,d^4}{7}+\frac{b\,d^4\,\mathrm{atan}(c\,x)}{7}+\frac{88\,b\,c^7\,d^4\,x^7}{105}+\frac{b\,c^8\,d^4\,x^8\,5\mathrm{i}}{3}+\frac{c\,d^4\,x\,(b+a\,28\mathrm{i})}{42}+\frac{c^6\,d^4\,x^6\,(3\,a+b\,10\mathrm{i})}{9}-\frac{c^4\,d^4\,x^4\,(39\,a+b\,1}{45}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + c*d*x*1i)^4)/x^8,x)
```

```
[Out] (88*b*c^7*d^4*log(c^2*x^2 + 1))/105 - ((a*d^4)/7 + (b*d^4*atan(c*x))/7 + (8
8*b*c^7*d^4*x^7)/105 + (b*c^8*d^4*x^8*5i)/3 + (c*d^4*x*(a*28i + b))/42 + (c
^6*d^4*x^6*(3*a + b*10i))/9 - (c^4*d^4*x^4*(39*a + b*19i))/45 - (c^2*d^4*x^
2*(111*a - b*14i))/105 - (c^3*d^4*x^3*(a*140i + 131*b))/420 - c^5*d^4*x^5*(
a*1i - (211*b)/420) - (37*b*c^2*d^4*x^2*atan(c*x))/35 - (b*c^3*d^4*x^3*atan
(c*x)*1i)/3 - (13*b*c^4*d^4*x^4*atan(c*x))/15 - b*c^5*d^4*x^5*atan(c*x)*1i
+ (b*c^6*d^4*x^6*atan(c*x))/3 + (b*c*d^4*x*atan(c*x)*2i)/3)/(x^7 + c^2*x^9)
 - (176*b*c^7*d^4*log(x))/105 - (b*c^10*d^4*atan((c^2*x)/(c^2)^(1/2))*5i)/(
3*(c^2)^(3/2))
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**4*(a+b*atan(c*x))/x**8,x)
```

```
[Out] Timed out
```

3.43 $\int \frac{x^3(a+b\tan^{-1}(cx))}{d+icdx}\,dx$

Optimal. Leaf size=196

$$\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d}-\frac{ix^3\left(a+b\tan^{-1}(cx)\right)}{3cd}+\frac{iax}{c^3d}+\frac{ib\mathrm{Li}_2\left(1-\frac{2}{icx+1}\right)}{2c^4d}+\frac{b\tan^{-1}(cx)}{2c^4d}$$

```
[Out] I*a*x/c^3/d-1/2*b*x/c^3/d+1/6*I*b*x^2/c^2/d+1/2*b*arctan(c*x)/c^4/d+I*b*x*a
rctan(c*x)/c^3/d+1/2*x^2*(a+b*arctan(c*x))/c^2/d-1/3*I*x^3*(a+b*arctan(c*x)
)/c/d+(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^4/d-2/3*I*b*ln(c^2*x^2+1)/c^4/d+1
/2*I*b*polylog(2,1-2/(1+I*c*x))/c^4/d
```

Rubi [A] time = 0.29, antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {4866, 4852, 266, 43, 321, 203, 4846, 260, 4854, 2402, 2315}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c^4d}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d}-\frac{ix^3\left(a+b\tan^{-1}(cx)\right)}{3cd}+\frac{iax}{c^3d}+\frac{ibx}{6c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + I*c*d*x),x]
```

```
[Out] (I*a*x)/(c^3*d) - (b*x)/(2*c^3*d) + ((I/6)*b*x^2)/(c^2*d) + (b*ArcTan[c*x])
/(2*c^4*d) + (I*b*x*ArcTan[c*x])/(c^3*d) + (x^2*(a + b*ArcTan[c*x]))/(2*c^2
*d) - ((I/3)*x^3*(a + b*ArcTan[c*x]))/(c*d) + ((a + b*ArcTan[c*x])*Log[2/(1
 + I*c*x)])/(c^4*d) - (((2*I)/3)*b*Log[1 + c^2*x^2])/(c^4*d) + ((I/2)*b*Pol
yLog[2, 1 - 2/(1 + I*c*x)])/(c^4*d)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
```

```
x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{d+icdx}\,dx = \frac{i\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{d+icdx}dx}{c} - \frac{i\int x^2\left(a+b\tan^{-1}(cx)\right)dx}{cd}$$

$$= -\frac{ix^3\left(a+b\tan^{-1}(cx)\right)}{3cd} - \frac{\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+icdx}dx}{c^2} + \frac{(ib)\int \frac{x^3}{1+c^2x^2}dx}{3d} + \frac{\int x\left(a+b\tan^{-1}\right.}{c^2d}$$

$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d} - \frac{ix^3\left(a+b\tan^{-1}(cx)\right)}{3cd} - \frac{i\int \frac{a+b\tan^{-1}(cx)}{d+icdx}dx}{c^3} + \frac{(ib)\,\mathrm{Subst}\left(\int\right.}{6}$$

$$= \frac{iax}{c^3d} - \frac{bx}{2c^3d} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d} - \frac{ix^3\left(a+b\tan^{-1}(cx)\right)}{3cd} + \frac{\left(a+b\tan^{-1}(cx)\right)\mathrm{lo}}{c^4d}$$

$$= \frac{iax}{c^3d} - \frac{bx}{2c^3d} + \frac{ibx^2}{6c^2d} + \frac{b\tan^{-1}(cx)}{2c^4d} + \frac{ibx\tan^{-1}(cx)}{c^3d} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d} - \frac{ix^3(}{}$$

$$= \frac{iax}{c^3d} - \frac{bx}{2c^3d} + \frac{ibx^2}{6c^2d} + \frac{b\tan^{-1}(cx)}{2c^4d} + \frac{ibx\tan^{-1}(cx)}{c^3d} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d} - \frac{ix^3(}{}$$

Mathematica [A] time = 0.48, size = 166, normalized size = 0.85

$$-\frac{i\left(\tan^{-1}(cx)\left(6a+b\left(2c^3x^3+3ic^2x^2-6cx+3i\right)+6ib\log\left(1+e^{2i\tan^{-1}(cx)}\right)\right)+2ac^3x^3+3iac^2x^2-3ia\log\left(c^2x\right.\right.}{6c^4d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + I*c*d*x),x]
```

```
[Out] ((-1/6*I)*(-b - 6*a*c*x - (3*I)*b*c*x + (3*I)*a*c^2*x^2 - b*c^2*x^2 + 2*a*c
^3*x^3 + 6*b*ArcTan[c*x]^2 + ArcTan[c*x]*(6*a + b*(3*I - 6*c*x + (3*I)*c^2*
x^2 + 2*c^3*x^3) + (6*I)*b*Log[1 + E^((2*I)*ArcTan[c*x])]) - (3*I)*a*Log[1
+ c^2*x^2] + 4*b*Log[1 + c^2*x^2] + 3*b*PolyLog[2, -E^((2*I)*ArcTan[c*x])])
)/(c^4*d)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^3\log\left(-\frac{cx+i}{cx-i}\right)-2i\,ax^3}{2\,cdx-2i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*log(-(c*x + I)/(c*x - I)) - 2*I*a*x^3)/(2*c*d*x - 2*I*d), x
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.10, size = 353, normalized size = 1.80

$$\frac{ibx\arctan(cx)}{c^3d} - \frac{ib\arctan(cx)\,x^3}{3cd} + \frac{a\,x^2}{2c^2d} - \frac{a\ln\left(c^2x^2+1\right)}{2c^4d} - \frac{5ib\ln\left(c^4x^4+10c^2x^2+9\right)}{48c^4d} + \frac{ib\,\mathrm{dilog}\left(-\frac{i(cx+i)}{2}\right)}{2c^4d} + \frac{ib\,x^2}{6c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(d+I*c*d*x),x)
```

```
[Out] I*b*x*arctan(c*x)/c^3/d-1/3*I/c*b/d*arctan(c*x)*x^3+1/2/c^2*a/d*x^2-1/2/c^4
*a/d*ln(c^2*x^2+1)-5/48*I/c^4*b/d*ln(c^4*x^4+10*c^2*x^2+9)+1/6*I*b*x^2/c^2/
d+I*a*x/c^3/d+1/2/c^2*b/d*arctan(c*x)*x^2-1/c^4*b/d*arctan(c*x)*ln(c*x-I)-I
/c^4*a/d*arctan(c*x)-11/24*I/c^4*b/d*ln(c^2*x^2+1)+1/2*I/c^4*b/d*ln(-1/2*I*
(I+c*x))*ln(c*x-I)-1/2*b*x/c^3/d+2/3*I/c^4*b/d+1/2*I/c^4*b/d*dilog(-1/2*I*(
I+c*x))-1/3*I/c*a/d*x^3-5/24/c^4*b/d*arctan(1/6*c^3*x^3+7/6*c*x)+5/24/c^4*b
/d*arctan(1/2*c*x)-5/12/c^4*b/d*arctan(1/2*c*x-1/2*I)-1/4*I/c^4*b/d*ln(c*x-
I)^2+11/12*b*arctan(c*x)/d/c^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}a\left(\frac{i\left(2c^2x^3+3icx^2-6x\right)}{c^3d}+\frac{6\log\left(icx+1\right)}{c^4d}\right)-\frac{-\frac{1}{2}\left(-12i\left(2\left(\frac{c^2x^3-3x}{c^7d}+\frac{3\arctan(cx)}{c^8d}\right)\arctan\left(cx\right)-\frac{c^2x^2+3\arctan(cx)}{c^8}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -1/6*a*(I*(2*c^2*x^3 + 3*I*c*x^2 - 6*x)/(c^3*d) + 6*log(I*c*x + 1)/(c^4*d))
 - 1/72*(432*I*c^8*d*integrate(1/12*x^4*arctan(c*x)/(c^5*d*x^2 + c^3*d), x)
 + 216*c^8*d*integrate(1/12*x^4*log(c^2*x^2 + 1)/(c^5*d*x^2 + c^3*d), x) -
432*c^7*d*integrate(1/12*x^3*arctan(c*x)/(c^5*d*x^2 + c^3*d), x) + 216*I*c^
7*d*integrate(1/12*x^3*log(c^2*x^2 + 1)/(c^5*d*x^2 + c^3*d), x) + 432*c^5*d
*integrate(1/12*x*arctan(c*x)/(c^5*d*x^2 + c^3*d), x) - 216*I*c^5*d*integra
te(1/12*x*log(c^2*x^2 + 1)/(c^5*d*x^2 + c^3*d), x) + 4*c^3*x^3 - 216*c^4*d*
integrate(1/12*log(c^2*x^2 + 1)/(c^5*d*x^2 + c^3*d), x) + 3*I*c^2*x^2 - 30*
c*x + (12*I*c^3*x^3 - 18*c^2*x^2 - 36*I*c*x + 30)*arctan(c*x) + 18*I*arctan
(c*x)^2 - (6*c^3*x^3 + 9*I*c^2*x^2 - 18*c*x + 3*I)*log(c^2*x^2 + 1) + 9*I*l
og(c^2*x^2 + 1)^2 + 18*I*log(12*c^5*d*x^2 + 12*c^3*d))*b/(c^4*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\ (a+b\,\mathrm{atan}\left(c\,x\right))}{d+c\,d\,x\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + c*d*x*1i),x)
```

```
[Out] int((x^3*(a + b*atan(c*x)))/(d + c*d*x*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{6ib\log\left(icx+1\right)}{c^2x^2+1}\,dx+\int \frac{12ac^4x^4}{c^2x^2+1}\,dx+\int \frac{6bcx}{c^2x^2+1}\,dx+\int \frac{bc^3x^3}{c^2x^2+1}\,dx+\int \frac{12iac^3x^3}{c^2x^2+1}\,dx+\int \frac{3ibc^2x^2}{c^2x^2+1}\,dx+\int \left(-\frac{2ibc^4x^4}{c^2x^2+1}\right)dx+\int\right.}{12c^3d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(6*I*b*log(I*c*x + 1)/(c**2*x**2 + 1), x) + Integral(12*a*c**4*
x**4/(c**2*x**2 + 1), x) + Integral(6*b*c*x/(c**2*x**2 + 1), x) + Integral(
b*c**3*x**3/(c**2*x**2 + 1), x) + Integral(12*I*a*c**3*x**3/(c**2*x**2 + 1)
, x) + Integral(3*I*b*c**2*x**2/(c**2*x**2 + 1), x) + Integral(-2*I*b*c**4*
x**4/(c**2*x**2 + 1), x) + Integral(-6*b*c*x*log(I*c*x + 1)/(c**2*x**2 + 1)
, x) + Integral(6*b*c**3*x**3*log(I*c*x + 1)/(c**2*x**2 + 1), x) + Integral
(-6*I*b*c**4*x**4*log(I*c*x + 1)/(c**2*x**2 + 1), x))/(12*c**3*d) + (2*b*c*
*3*x**3 + 3*I*b*c**2*x**2 - 6*b*c*x - 6*I*b*log(I*c*x + 1))*log(-I*c*x + 1)
/(12*c**4*d)
```

3.44 $\int \frac{x^2(a+b\tan^{-1}(cx))}{d+icdx}\,dx$

Optimal. Leaf size=156

$$-\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}-\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2cd}+\frac{ax}{c^2d}+\frac{b\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2c^3d}-\frac{ib\tan^{-1}(cx)}{2c^3d}+\frac{ibx}{2c^2d}+\frac{bx\tan^{-1}(c\ldots}{c^2d}$$

```
[Out] a*x/c^2/d+1/2*I*b*x/c^2/d-1/2*I*b*arctan(c*x)/c^3/d+b*x*arctan(c*x)/c^2/d-1
/2*I*x^2*(a+b*arctan(c*x))/c/d-I*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3/d-1/
2*b*ln(c^2*x^2+1)/c^3/d+1/2*b*polylog(2,1-2/(1+I*c*x))/c^3/d
```

Rubi [A] time = 0.18, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {4866, 4852, 321, 203, 4846, 260, 4854, 2402, 2315}

$$\frac{b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c^3d}-\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}-\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2cd}+\frac{ax}{c^2d}-\frac{b\log\left(c^2x^2+1\right)}{2c^3d}+\frac{ibx}{2c^2d}+\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + I*c*d*x),x]
```

```
[Out] (a*x)/(c^2*d) + ((I/2)*b*x)/(c^2*d) - ((I/2)*b*ArcTan[c*x])/(c^3*d) + (b*x*
ArcTan[c*x])/(c^2*d) - ((I/2)*x^2*(a + b*ArcTan[c*x]))/(c*d) - (I*(a + b*Ar
cTan[c*x])*Log[2/(1 + I*c*x)])/(c^3*d) - (b*Log[1 + c^2*x^2])/(2*c^3*d) + (
b*PolyLog[2, 1 - 2/(1 + I*c*x)])/(2*c^3*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{d+icdx}\,dx=\frac{i\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+icdx}\,dx}{c}-\frac{i\int x\left(a+b\tan^{-1}(cx)\right)\,dx}{cd}$$
$$=-\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{\int \frac{a+b\tan^{-1}(cx)}{d+icdx}\,dx}{c^2}+\frac{(ib)\int \frac{x^2}{1+c^2x^2}\,dx}{2d}+\frac{\int \left(a+b\tan^{-1}(cx)\right)\,d}{c^2d}$$
$$=\frac{ax}{c^2d}+\frac{ibx}{2c^2d}-\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^3d}-\frac{(ib)\int \frac{1}{1+c^2x^2}\,d}{2c^2d}$$
$$=\frac{ax}{c^2d}+\frac{ibx}{2c^2d}-\frac{ib\tan^{-1}(cx)}{2c^3d}+\frac{bx\tan^{-1}(cx)}{c^2d}-\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{i\left(a+b\tan^{-1}(c\right.}{c^3}$$
$$=\frac{ax}{c^2d}+\frac{ibx}{2c^2d}-\frac{ib\tan^{-1}(cx)}{2c^3d}+\frac{bx\tan^{-1}(cx)}{c^2d}-\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{i\left(a+b\tan^{-1}(c\right.}{c^3}$$

Mathematica [A] time = 0.20, size = 132, normalized size = 0.85

$$-\frac{i\tan^{-1}(cx)\left(-2ia+bc^2x^2+2ibcx+2b\log\left(1+e^{2i\tan^{-1}(cx)}\right)+b\right)+iac^2x^2-ia\log\left(c^2x^2+1\right)-2acx+b\log\left(c^2x\right.}{2c^3d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + I*c*d*x),x]
```

```
[Out] -1/2*(-2*a*c*x - I*b*c*x + I*a*c^2*x^2 + 2*b*ArcTan[c*x]^2 + I*ArcTan[c*x]*
((-2*I)*a + b + (2*I)*b*c*x + b*c^2*x^2 + 2*b*Log[1 + E^((2*I)*ArcTan[c*x])
]) - I*a*Log[1 + c^2*x^2] + b*Log[1 + c^2*x^2] + b*PolyLog[2, -E^((2*I)*Arc
Tan[c*x])])/(c^3*d)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\log\left(-\frac{cx+i}{cx-i}\right)-2i\,ax^2}{2\,cdx-2i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*log(-(c*x + I)/(c*x - I)) - 2*I*a*x^2)/(2*c*d*x - 2*I*d), x
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.08, size = 308, normalized size = 1.97

$$\frac{ax}{c^2d}-\frac{ib\arctan(cx)\,x^2}{2cd}+\frac{ib\arctan(cx)\ln(cx-i)}{c^3d}-\frac{a\arctan(cx)}{c^3d}+\frac{bx\arctan(cx)}{c^2d}+\frac{ib\arctan\left(\frac{1}{6}c^3x^3+\frac{7}{6}cx\right)}{8c^3d}-\frac{ia\,x}{2cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(d+I*c*d*x),x)
```

```
[Out] 1/c^2*a/d*x-1/2*I/c*b/d*arctan(c*x)*x^2+I/c^3*b/d*arctan(c*x)*ln(c*x-I)-1/c
^3*a/d*arctan(c*x)+b*x*arctan(c*x)/c^2/d+1/8*I/c^3*b/d*arctan(1/6*c^3*x^3+7
/6*c*x)-1/2*I/c*a/d*x^2+1/2/c^3*b/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/2/c^3*b/
d*dilog(-1/2*I*(I+c*x))-1/4/c^3*b/d*ln(c*x-I)^2+1/4*I/c^3*b/d*arctan(1/2*c*
x-1/2*I)+1/2/c^3*b/d-1/16/c^3*b/d*ln(c^4*x^4+10*c^2*x^2+9)-3/4*I/c^3*b/d*ar
ctan(c*x)+1/2*I/c^3*a/d*ln(c^2*x^2+1)-1/8*I/c^3*b/d*arctan(1/2*c*x)-3/8*b*l
n(c^2*x^2+1)/c^3/d+1/2*I*b*x/c^2/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}a\left(\frac{icx^2-2x}{c^2d}-\frac{2i\log(icx+1)}{c^3d}\right)-\frac{\frac{1}{2}\left(\left(2\left(\frac{x^2}{c^4d}-\frac{\log\left(c^2x^2+1\right)}{c^6d}\right)\log\left(c^2x^2+1\right)-\frac{2c^2x^2-\log\left(c^2x^2+1\right)^2-2\log\left(c^2x^2+1\right)}{c^6d}\right)c^6\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -1/2*a*((I*c*x^2 - 2*x)/(c^2*d) - 2*I*log(I*c*x + 1)/(c^3*d)) - 1/8*(32*I*c
^6*d*integrate(1/8*x^3*arctan(c*x)/(c^4*d*x^2 + c^2*d), x) + 16*c^6*d*integ
rate(1/8*x^3*log(c^2*x^2 + 1)/(c^4*d*x^2 + c^2*d), x) - 32*c^5*d*integrate(
1/8*x^2*arctan(c*x)/(c^4*d*x^2 + c^2*d), x) + 16*I*c^5*d*integrate(1/8*x^2*
log(c^2*x^2 + 1)/(c^4*d*x^2 + c^2*d), x) - 32*I*c^4*d*integrate(1/8*x*arcta
n(c*x)/(c^4*d*x^2 + c^2*d), x) - 16*c^4*d*integrate(1/8*x*log(c^2*x^2 + 1)/
(c^4*d*x^2 + c^2*d), x) + 16*I*c^3*d*integrate(1/8*log(c^2*x^2 + 1)/(c^4*d*
x^2 + c^2*d), x) + c^2*x^2 + 2*I*c*x + (2*I*c^2*x^2 - 4*c*x - 2*I)*arctan(c
*x) + 2*arctan(c*x)^2 - (c^2*x^2 + 2*I*c*x + 1)*log(c^2*x^2 + 1) + log(c^2*
x^2 + 1)^2 + 2*log(8*c^4*d*x^2 + 8*c^2*d))*b/(c^3*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\ (a+b\,\mathrm{atan}\,(c\,x))}{d+c\,d\,x\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + c*d*x*1i),x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + c*d*x*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{2b\log(icx+1)}{c^2x^2+1}\,dx + \int \frac{4ac^3x^3}{c^2x^2+1}\,dx + \int \frac{bc^2x^2}{c^2x^2+1}\,dx + \int \frac{4iac^2x^2}{c^2x^2+1}\,dx + \int \left(-\frac{2ibcx}{c^2x^2+1}\right)dx + \int \left(-\frac{ibc^3x^3}{c^2x^2+1}\right)dx + \int \frac{2bc^2x^2\log(icx}{c^2x^2+1}\right.}{4c^2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(2*b*log(I*c*x + 1)/(c**2*x**2 + 1), x) + Integral(4*a*c**3*x**
3/(c**2*x**2 + 1), x) + Integral(b*c**2*x**2/(c**2*x**2 + 1), x) + Integral
(4*I*a*c**2*x**2/(c**2*x**2 + 1), x) + Integral(-2*I*b*c*x/(c**2*x**2 + 1),
 x) + Integral(-I*b*c**3*x**3/(c**2*x**2 + 1), x) + Integral(2*b*c**2*x**2*
log(I*c*x + 1)/(c**2*x**2 + 1), x) + Integral(2*I*b*c*x*log(I*c*x + 1)/(c**
2*x**2 + 1), x) + Integral(-2*I*b*c**3*x**3*log(I*c*x + 1)/(c**2*x**2 + 1),
 x))/(4*c**2*d) + (b*c**2*x**2 + 2*I*b*c*x - 2*b*log(I*c*x + 1))*log(-I*c*x
 + 1)/(4*c**3*d)
```

3.45 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+icdx}\,dx$

Optimal. Leaf size=110

$$-\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d}-\frac{iax}{cd}-\frac{ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2c^2d}+\frac{ib\log\left(c^2x^2+1\right)}{2c^2d}-\frac{ibx\tan^{-1}(cx)}{cd}$$

```
[Out] -I*a*x/c/d-I*b*x*arctan(c*x)/c/d-(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^2/d+1/
2*I*b*ln(c^2*x^2+1)/c^2/d-1/2*I*b*polylog(2,1-2/(1+I*c*x))/c^2/d
```

Rubi [A] time = 0.10, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4866, 4846, 260, 4854, 2402, 2315}

$$-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c^2d}-\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d}-\frac{iax}{cd}+\frac{ib\log\left(c^2x^2+1\right)}{2c^2d}-\frac{ibx\tan^{-1}(cx)}{cd}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + I*c*d*x),x]
```

```
[Out] ((-I)*a*x)/(c*d) - (I*b*x*ArcTan[c*x])/(c*d) - ((a + b*ArcTan[c*x])*Log[2/(
1 + I*c*x)])/(c^2*d) + ((I/2)*b*Log[1 + c^2*x^2])/(c^2*d) - ((I/2)*b*PolyLo
g[2, 1 - 2/(1 + I*c*x)])/(c^2*d)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+icdx}\,dx = \frac{i\int \frac{a+b\tan^{-1}(cx)}{d+icdx}\,dx}{c} - \frac{i\int \left(a+b\tan^{-1}(cx)\right)dx}{cd}$$
$$= -\frac{iax}{cd} - \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d} - \frac{(ib)\int \tan^{-1}(cx)\,dx}{cd} + \frac{b\int \frac{\log\left(\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{cd}$$
$$= -\frac{iax}{cd} - \frac{ibx\tan^{-1}(cx)}{cd} - \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d} + \frac{(ib)\int \frac{x}{1+c^2x^2}\,dx}{d} - \frac{(ib)\,\text{Subst}\,(}{}$$
$$= -\frac{iax}{cd} - \frac{ibx\tan^{-1}(cx)}{cd} - \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d} + \frac{ib\log\left(1+c^2x^2\right)}{2c^2d} - \frac{ib\text{Li}_2\left(1-\right.}{2c^2}$$

Mathematica [A] time = 0.18, size = 108, normalized size = 0.98

$$\frac{2i\tan^{-1}(cx)\left(a-bcx+ib\log\left(1+e^{2i\tan^{-1}(cx)}\right)\right)+a\log\left(c^2x^2+1\right)-2iacx+ib\log\left(c^2x^2+1\right)+ib\text{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right.}{2c^2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + I*c*d*x),x]
```

```
[Out] ((-2*I)*a*c*x + (2*I)*b*ArcTan[c*x]^2 + (2*I)*ArcTan[c*x]*(a - b*c*x + I*b*
Log[1 + E^((2*I)*ArcTan[c*x])]) + a*Log[1 + c^2*x^2] + I*b*Log[1 + c^2*x^2]
 + I*b*PolyLog[2, -E^((2*I)*ArcTan[c*x])])/(2*c^2*d)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx\log\left(-\frac{cx+i}{cx-i}\right)-2i\,ax}{2\,cdx-2i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((b*x*log(-(c*x + I)/(c*x - I)) - 2*I*a*x)/(2*c*d*x - 2*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.07, size = 244, normalized size = 2.22

$$-\frac{iax}{dc}+\frac{a\ln\left(c^2x^2+1\right)}{2c^2d}+\frac{ia\arctan(cx)}{c^2d}-\frac{ibx\arctan(cx)}{dc}+\frac{b\arctan(cx)\ln(cx-i)}{c^2d}-\frac{ib\ln\left(-\frac{i(cx+i)}{2}\right)\ln(cx-i)}{2c^2d}-\frac{ib\,\text{dil}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(d+I*c*d*x),x)
```

```
[Out] -I*a*x/d/c+1/2/c^2*a/d*ln(c^2*x^2+1)+I/c^2*a/d*arctan(c*x)-I*b*x*arctan(c*x
)/d/c+1/c^2*b/d*arctan(c*x)*ln(c*x-I)-1/2*I/c^2*b/d*ln(-1/2*I*(I+c*x))*ln(c
*x-I)-1/2*I/c^2*b/d*dilog(-1/2*I*(I+c*x))+1/4*I/c^2*b/d*ln(c*x-I)^2+1/8*I/c
^2*b/d*ln(c^8*x^8+12*c^6*x^6+30*c^4*x^4+28*c^2*x^2+9)-1/4/c^2*b/d*arctan(1/
12*c^3*x^3+13/12*c*x)-1/4/c^2*b/d*arctan(1/4*c*x)+1/2/c^2*b/d*arctan(1/2*c*
x-1/2*I)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(-\frac{i\,x}{cd}+\frac{\log\left(i\,cx+1\right)}{c^2d}\right)-\frac{\left(2i\left(2\left(\frac{x}{c^3d}-\frac{\arctan(cx)}{c^4d}\right)\arctan\left(cx\right)+\frac{\arctan(cx)^2-\log\left(c^2x^2+1\right)}{c^4d}\right)c^4d+2\,c^4d\int\frac{x^2\log\left(c^2x^2+1\right)}{c^3dx^2+cd}\,d\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] a*(-I*x/(c*d) + log(I*c*x + 1)/(c^2*d)) - 1/8*(8*I*c^4*d*integrate(1/2*x^2*
arctan(c*x)/(c^3*d*x^2 + c*d), x) + 4*c^4*d*integrate(1/2*x^2*log(c^2*x^2 +
 1)/(c^3*d*x^2 + c*d), x) - 16*c^3*d*integrate(1/2*x*arctan(c*x)/(c^3*d*x^2
 + c*d), x) + 8*I*c^3*d*integrate(1/2*x*log(c^2*x^2 + 1)/(c^3*d*x^2 + c*d),
 x) + 4*c^2*d*integrate(1/2*log(c^2*x^2 + 1)/(c^3*d*x^2 + c*d), x) - 2*c*x*
log(c^2*x^2 + 1) + 4*c*x - 4*(-I*c*x + 1)*arctan(c*x) - 2*I*arctan(c*x)^2 -
 I*log(c^2*x^2 + 1)^2 - 2*I*log(2*c^3*d*x^2 + 2*c*d))*b/(c^2*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{d+c\,d\,x\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + c*d*x*1i),x)
```

```
[Out] int((x*(a + b*atan(c*x)))/(d + c*d*x*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int\left(-\frac{ib\log\left(icx+1\right)}{c^2x^2+1}\right)dx+\int\frac{2ac^2x^2}{c^2x^2+1}\,dx+\int\left(-\frac{bcx}{c^2x^2+1}\right)dx+\int\frac{2iacx}{c^2x^2+1}\,dx+\int\left(-\frac{ibc^2x^2}{c^2x^2+1}\right)dx+\int\frac{2bcx\log\left(icx+1\right)}{c^2x^2+1}\,dx+\cdots\right)}{2cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(-I*b*log(I*c*x + 1)/(c**2*x**2 + 1), x) + Integral(2*a*c**2*x*
*2/(c**2*x**2 + 1), x) + Integral(-b*c*x/(c**2*x**2 + 1), x) + Integral(2*I
*a*c*x/(c**2*x**2 + 1), x) + Integral(-I*b*c**2*x**2/(c**2*x**2 + 1), x) +
Integral(2*b*c*x*log(I*c*x + 1)/(c**2*x**2 + 1), x) + Integral(-I*b*c**2*x*
*2*log(I*c*x + 1)/(c**2*x**2 + 1), x))/(2*c*d) + (b*c*x + I*b*log(I*c*x + 1
))*log(-I*c*x + 1)/(2*c**2*d)
```

3.46 $\int \frac{a+b\tan^{-1}(cx)}{d+icdx}\,dx$

Optimal. Leaf size=59

$$\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{cd}-\frac{b\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2cd}$$

```
[Out] I*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c/d-1/2*b*polylog(2,1-2/(1+I*c*x))/c/d
```

Rubi [A] time = 0.05, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4854, 2402, 2315}

$$\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{cd}-\frac{b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + I*c*d*x),x]
```

```
[Out] (I*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c*d) - (b*PolyLog[2, 1 - 2/(1 +
 I*c*x)])/(2*c*d)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{d+icdx}\,dx &= \frac{i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{cd}-\frac{(ib)\int \frac{\log\left(\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{d}\\
&= \frac{i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{cd}-\frac{b\,\text{Subst}\left(\int \frac{\log(2x)}{1-2x}\,dx,x,\frac{1}{1+icx}\right)}{cd}\\
&= \frac{i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{cd}-\frac{b\text{Li}_2\left(1-\frac{2}{1+icx}\right)}{2cd}
\end{aligned}$$

Mathematica [A] time = 0.02, size = 60, normalized size = 1.02

$$\frac{2i\log\left(\frac{2d}{d+icdx}\right)\left(a+b\tan^{-1}(cx)\right)-b\text{Li}_2\left(\frac{cx+i}{cx-i}\right)}{2cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + I*c*d*x),x]
```

```
[Out] ((2*I)*(a + b*ArcTan[c*x])*Log[(2*d)/(d + I*c*d*x)] - b*PolyLog[2, (I + c*x
)/(-I + c*x)])/(2*c*d)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(-\frac{cx+i}{cx-i}\right)-2i\,a}{2\,cdx-2i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((b*log(-(c*x + I)/(c*x - I)) - 2*I*a)/(2*c*d*x - 2*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.04, size = 142, normalized size = 2.41

$$-\frac{ia\ln\left(c^2x^2+1\right)}{2cd}+\frac{a\arctan(cx)}{cd}-\frac{ib\ln(icx+1)\arctan(cx)}{cd}-\frac{b\ln\left(\frac{1}{2}-\frac{icx}{2}\right)\ln(icx+1)}{2cd}+\frac{b\ln\left(\frac{1}{2}-\frac{icx}{2}\right)\ln\left(\frac{icx}{2}+\right.}{2cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(d+I*c*d*x),x)
```

```
[Out] -1/2*I/c*a/d*ln(c^2*x^2+1)+1/c*a/d*arctan(c*x)-I/c*b/d*ln(1+I*c*x)*arctan(c
*x)-1/2/c*b/d*ln(1/2-1/2*I*c*x)*ln(1+I*c*x)+1/2/c*b/d*ln(1/2-1/2*I*c*x)*ln(
1/2*I*c*x+1/2)+1/2/c*b/d*dilog(1/2*I*c*x+1/2)+1/4/c*b/d*ln(1+I*c*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(8i\,c^2dsage_0x-4\,\arctan(cx)^2\right)b}{8\,cd}-\frac{i\,a\log(i\,cdx+d)}{cd}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -1/8*(8*I*c^2*d*integrate(x*arctan(c*x)/(c^2*d*x^2 + d), x) + 4*c^2*d*integ
rate(x*log(c^2*x^2 + 1)/(c^2*d*x^2 + d), x) - 4*arctan(c*x)^2 - log(c^2*x^2
 + 1)^2)*b/(c*d) - I*a*log(I*c*d*x + d)/(c*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\mathrm{atan}(c\,x)}{d+c\,d\,x\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + c*d*x*1i),x)
```

```
[Out] int((a + b*atan(c*x))/(d + c*d*x*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{b\log(-icx+1)\log(icx+1)}{2cd} - \frac{i\left(\int \frac{ia}{c^2x^2+1}\,dx + \int \frac{acx}{c^2x^2+1}\,dx + \int \left(-\frac{ibcx\log(icx+1)}{c^2x^2+1}\right)dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(d+I*c*d*x),x)
```

```
[Out] b*log(-I*c*x + 1)*log(I*c*x + 1)/(2*c*d) - I*(Integral(I*a/(c**2*x**2 + 1),
 x) + Integral(a*c*x/(c**2*x**2 + 1), x) + Integral(-I*b*c*x*log(I*c*x + 1)
/(c**2*x**2 + 1), x))/d
```

3.47 $\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)}\,dx$

Optimal. Leaf size=54

$$\frac{\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{ib\text{Li}_2\left(\frac{2}{icx+1}-1\right)}{2d}$$

```
[Out] (a+b*arctan(c*x))*ln(2-2/(1+I*c*x))/d+1/2*I*b*polylog(2,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 0.07, antiderivative size = 54, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.087, Rules used = {4868, 2447}

$$\frac{ib\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)}{2d}+\frac{\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + I*c*d*x)),x]
```

```
[Out] ((a + b*ArcTan[c*x])*Log[2 - 2/(1 + I*c*x)])/d + ((I/2)*b*PolyLog[2, -1 + 2
/(1 + I*c*x)])/d
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)}\,dx&=\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\right)}{d}-\frac{(bc)\int\frac{\log\left(2-\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{d}\\&=\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{ib\text{Li}_2\left(-1+\frac{2}{1+icx}\right)}{2d}\end{aligned}$$

Mathematica [A] time = 0.06, size = 102, normalized size = 1.89

$$\frac{\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{a\log(x)}{d}+\frac{ib\text{Li}_2(-icx)}{2d}-\frac{ib\text{Li}_2(icx)}{2d}+\frac{ib\text{Li}_2\left(-\frac{cx+i}{i-cx}\right)}{2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + I*c*d*x)),x]
```

```
[Out] (a*Log[x])/d + ((a + b*ArcTan[c*x])*Log[(2*I)/(I - c*x)])/d + ((I/2)*b*Poly
Log[2, (-I)*c*x])/d - ((I/2)*b*PolyLog[2, I*c*x])/d + ((I/2)*b*PolyLog[2, -
((I + c*x)/(I - c*x))])/d
```

fricas [A] time = 0.55, size = 43, normalized size = 0.80

$$\frac{-i\,b\mathrm{Li}_2\left(\frac{cx+i}{cx-i}+1\right)+2\,a\log(x)-2\,a\log\left(\frac{cx-i}{c}\right)}{2\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] 1/2*(-I*b*dilog((c*x + I)/(c*x - I) + 1) + 2*a*log(x) - 2*a*log((c*x - I)/c
))/d
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.06, size = 193, normalized size = 3.57

$$\frac{a\ln(cx)}{d}-\frac{a\ln\left(c^2x^2+1\right)}{2d}-\frac{ia\arctan(cx)}{d}-\frac{b\arctan(cx)\ln(cx-i)}{d}+\frac{b\ln(cx)\arctan(cx)}{d}+\frac{ib\ln(cx)\ln(icx+1)}{2d}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(d+I*c*d*x),x)
```

```
[Out] a/d*ln(c*x)-1/2*a/d*ln(c^2*x^2+1)-I*a/d*arctan(c*x)-b/d*arctan(c*x)*ln(c*x-
I)+b/d*ln(c*x)*arctan(c*x)+1/2*I*b/d*ln(c*x)*ln(1+I*c*x)-1/2*I*b/d*ln(c*x)*
ln(1-I*c*x)+1/2*I*b/d*dilog(1+I*c*x)-1/2*I*b/d*dilog(1-I*c*x)+1/2*I*b/d*ln(
-1/2*I*(I+c*x))*ln(c*x-I)+1/2*I*b/d*dilog(-1/2*I*(I+c*x))-1/4*I*b/d*ln(c*x-
I)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}b\left(\frac{i\arctan(cx)^2}{d}-2\int\frac{\arctan(cx)}{c^2dx^3+dx}\,dx\right)-a\left(\frac{\log(i\,cx+1)}{d}-\frac{\log(x)}{d}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -1/2*b*(I*arctan(c*x)^2/d - 2*integrate(arctan(c*x)/(c^2*d*x^3 + d*x), x))
- a*(log(I*c*x + 1)/d - log(x)/d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{a+b\,\mathrm{atan}(c\,x)}{x\,(d+c\,d\,x\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a}{cx^2-ix}\,dx + \int \frac{b\operatorname{atan}(cx)}{cx^2-ix}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a/(c*x**2 - I*x), x) + Integral(b*atan(c*x)/(c*x**2 - I*x), x)
)/d
```

3.48 $\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)}\,dx$

Optimal. Leaf size=100

$$-\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ic\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{bc\log\left(c^2x^2+1\right)}{2d}+\frac{bc\text{Li}_2\left(\frac{2}{icx+1}-1\right)}{2d}+\frac{bc\log(x)}{d}$$

```
[Out] (-a-b*arctan(c*x))/d/x+b*c*ln(x)/d-1/2*b*c*ln(c^2*x^2+1)/d-I*c*(a+b*arctan(
c*x))*ln(2-2/(1+I*c*x))/d+1/2*b*c*polylog(2,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 0.15, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4870, 4852, 266, 36, 29, 31, 4868, 2447}

$$\frac{bc\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)}{2d}-\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ic\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{bc\log\left(c^2x^2+1\right)}{2d}+\frac{bc\log(x)}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + I*c*d*x)),x]
```

```
[Out] -((a + b*ArcTan[c*x])/(d*x)) + (b*c*Log[x])/d - (b*c*Log[1 + c^2*x^2])/(2*d
) - (I*c*(a + b*ArcTan[c*x])*Log[2 - 2/(1 + I*c*x)])/d + (b*c*PolyLog[2, -1
 + 2/(1 + I*c*x)])/(2*d)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
```

```
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
 LtQ[m, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)}\,dx &= -\left((ic)\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)}\,dx\right)+\frac{\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d}\\
&= -\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ic\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{(bc)\int \frac{1}{x\left(1+c^2x^2\right)}\,dx}{d}+\frac{\left(ibc^2\right)\ldots}{\ldots}\\
&= -\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ic\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{bc\text{Li}_2\left(-1+\frac{2}{1+icx}\right)}{2d}+\frac{(bc)\,\text{Su}\ldots}{\ldots}\\
&= -\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ic\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{bc\text{Li}_2\left(-1+\frac{2}{1+icx}\right)}{2d}+\frac{(bc)\,\text{Su}\ldots}{\ldots}\\
&= -\frac{a+b\tan^{-1}(cx)}{dx}+\frac{bc\log(x)}{d}-\frac{bc\log\left(1+c^2x^2\right)}{2d}-\frac{ic\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\ldots\right.}{d}
\end{aligned}$$

Mathematica [A] time = 0.10, size = 149, normalized size = 1.49

$$-\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ic\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{iac\log(x)}{d}+\frac{bc\left(2\log(x)-\log\left(c^2x^2+1\right)\right)}{2d}+\frac{bc\text{Li}_2(-icx)}{2d}-\ldots$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + I*c*d*x)),x]
```

```
[Out] -((a + b*ArcTan[c*x])/(d*x)) - (I*a*c*Log[x])/d - (I*c*(a + b*ArcTan[c*x])*
Log[(2*I)/(I - c*x)])/d + (b*c*(2*Log[x] - Log[1 + c^2*x^2]))/(2*d) + (b*c*
PolyLog[2, (-I)*c*x])/(2*d) - (b*c*PolyLog[2, I*c*x])/(2*d) + (b*c*PolyLog[
2, -((I + c*x)/(I - c*x))])/(2*d)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(-\frac{cx+i}{cx-i}\right)-2i\,a}{2\,cdx^3-2i\,dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((b*log(-(c*x + I)/(c*x - I)) - 2*I*a)/(2*c*d*x^3 - 2*I*d*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.07, size = 252, normalized size = 2.52

$$-\frac{a}{dx}-\frac{ica\ln(cx)}{d}-\frac{icb\arctan(cx)\ln(cx)}{d}-\frac{ca\arctan(cx)}{d}-\frac{b\arctan(cx)}{dx}+\frac{ica\ln\left(c^2x^2+1\right)}{2d}+\frac{icb\arctan(cx)\ln(cx-}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(d+I*c*d*x),x)
```

```
[Out] -a/d/x-I*c*a/d*ln(c*x)-I*c*b/d*arctan(c*x)*ln(c*x)-c*a/d*arctan(c*x)-b/d*ar
ctan(c*x)/x+1/2*I*c*a/d*ln(c^2*x^2+1)+I*c*b/d*arctan(c*x)*ln(c*x-I)+1/2*c*b
/d*ln(c*x)*ln(1+I*c*x)-1/2*c*b/d*ln(c*x)*ln(1-I*c*x)+1/2*c*b/d*dilog(1+I*c*
x)-1/2*c*b/d*dilog(1-I*c*x)+1/2*c*b/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/2*c*b/
d*dilog(-1/2*I*(I+c*x))-1/4*c*b/d*ln(c*x-I)^2+c*b/d*ln(c*x)-1/2*b*c*ln(c^2*
x^2+1)/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(-i\,c\int\frac{\arctan(cx)}{c^2dx^3+dx}\,dx+\int\frac{\arctan(cx)}{c^2dx^4+dx^2}\,dx\right)b+a\left(\frac{i\,c\log(i\,cx+1)}{d}-\frac{i\,c\log(x)}{d}-\frac{1}{dx}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] (-I*c*integrate(arctan(c*x)/(c^2*d*x^3 + d*x), x) + integrate(arctan(c*x)/(
c^2*d*x^4 + d*x^2), x))*b + a*(I*c*log(I*c*x + 1)/d - I*c*log(x)/d - 1/(d*x
))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\mathrm{atan}(c\,x)}{x^2\,\left(d+c\,d\,x\,1\mathrm{i}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int\frac{a}{cx^3-ix^2}\,dx+\int\frac{b\,\mathrm{atan}(cx)}{cx^3-ix^2}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a/(c*x**3 - I*x**2), x) + Integral(b*atan(c*x)/(c*x**3 - I*x**
2), x))/d
```

3.49 $\int \frac{a+b\tan^{-1}(cx)}{x^3(d+icdx)}\,dx$

Optimal. Leaf size=161

$$-\frac{c^2\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{a+b\tan^{-1}(cx)}{2dx^2}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{ibc^2\text{Li}_2\left(\frac{2}{icx+1}-1\right)}{2d}+\frac{ibc^2\log\left(c^2x\right.}{2d}$$

```
[Out] -1/2*b*c/d/x-1/2*b*c^2*arctan(c*x)/d+1/2*(-a-b*arctan(c*x))/d/x^2+I*c*(a+b*
arctan(c*x))/d/x-I*b*c^2*ln(x)/d+1/2*I*b*c^2*ln(c^2*x^2+1)/d-c^2*(a+b*arcta
n(c*x))*ln(2-2/(1+I*c*x))/d-1/2*I*b*c^2*polylog(2,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 0.24, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4870, 4852, 325, 203, 266, 36, 29, 31, 4868, 2447}

$$-\frac{ibc^2\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)}{2d}-\frac{c^2\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{a+b\tan^{-1}(cx)}{2dx^2}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{dx}+\frac{ibc}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + I*c*d*x)),x]
```

```
[Out] -(b*c)/(2*d*x) - (b*c^2*ArcTan[c*x])/(2*d) - (a + b*ArcTan[c*x])/(2*d*x^2)
+ (I*c*(a + b*ArcTan[c*x]))/(d*x) - (I*b*c^2*Log[x])/d + ((I/2)*b*c^2*Log[1
 + c^2*x^2])/d - (c^2*(a + b*ArcTan[c*x])*Log[2 - 2/(1 + I*c*x)])/d - ((I/2
)*b*c^2*PolyLog[2, -1 + 2/(1 + I*c*x)])/d
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
```

```
b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
 LtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3(d+icdx)}\,dx = -\left((ic)\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)}\,dx\right)+\frac{\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{2dx^2}-c^2\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)}\,dx-\frac{(ic)\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d}+\frac{(bc)\int \frac{1}{x^2\left(1+c^2x^2\right)}\,dx}{2d}$$

$$= -\frac{bc}{2dx}-\frac{a+b\tan^{-1}(cx)}{2dx^2}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{c^2\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\right)}{d}-$$

$$= -\frac{bc}{2dx}-\frac{bc^2\tan^{-1}(cx)}{2d}-\frac{a+b\tan^{-1}(cx)}{2dx^2}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{c^2\left(a+b\tan^{-1}(cx)\right)\log}{d}$$

$$= -\frac{bc}{2dx}-\frac{bc^2\tan^{-1}(cx)}{2d}-\frac{a+b\tan^{-1}(cx)}{2dx^2}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{c^2\left(a+b\tan^{-1}(cx)\right)\log}{d}$$

$$= -\frac{bc}{2dx}-\frac{bc^2\tan^{-1}(cx)}{2d}-\frac{a+b\tan^{-1}(cx)}{2dx^2}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{ibc^2\log(x)}{d}+\frac{ibc^2\log(}{2}$$

Mathematica [C] time = 0.19, size = 178, normalized size = 1.11

$$-\frac{2c^2\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right)+\frac{a+b\tan^{-1}(cx)}{x^2}-\frac{2ic\left(a+b\tan^{-1}(cx)\right)}{x}+2ac^2\log(x)+\frac{bc\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)}{x}+ibc^2\text{Li}_2(-}{2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + I*c*d*x)),x]
```

```
[Out] -1/2*((a + b*ArcTan[c*x])/x^2 - ((2*I)*c*(a + b*ArcTan[c*x]))/x + (b*c*Hype
rgeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/x + 2*a*c^2*Log[x] + 2*c^2*(a + b*
ArcTan[c*x])*Log[(2*I)/(I - c*x)] + I*b*c^2*(2*Log[x] - Log[1 + c^2*x^2]) +
 I*b*c^2*PolyLog[2, (-I)*c*x] - I*b*c^2*PolyLog[2, I*c*x] + I*b*c^2*PolyLog
[2, (I + c*x)/(-I + c*x)])/d
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\log\left(-\frac{cx+i}{cx-i}\right)-2i\,a}{2\,cdx^4-2i\,dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((b*log(-(c*x + I)/(c*x - I)) - 2*I*a)/(2*c*d*x^4 - 2*I*d*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.07, size = 335, normalized size = 2.08

$$-\frac{a}{2d\,x^2}-\frac{ic^2b\,\text{dilog}\left(icx+1\right)}{2d}-\frac{c^2a\ln\left(cx\right)}{d}+\frac{c^2a\ln\left(c^2x^2+1\right)}{2d}+\frac{ic^2a\arctan\left(cx\right)}{d}-\frac{b\arctan\left(cx\right)}{2d\,x^2}+\frac{ic^2b\,\text{dilog}\left(-icx\right.}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(d+I*c*d*x),x)
```

```
[Out] -1/2*a/d/x^2+I*c^2*a/d*arctan(c*x)-c^2*a/d*ln(c*x)+1/2*c^2*a/d*ln(c^2*x^2+1
)+1/2*I*b*c^2*ln(c^2*x^2+1)/d-1/2*b/d*arctan(c*x)/x^2+I*c*b/d*arctan(c*x)/x
-c^2*b/d*ln(c*x)*arctan(c*x)+c^2*b/d*arctan(c*x)*ln(c*x-I)-1/2*I*c^2*b/d*di
log(-1/2*I*(I+c*x))-1/2*b*c/d/x-1/2*I*c^2*b/d*dilog(1+I*c*x)-1/2*b*c^2*arct
an(c*x)/d-1/2*I*c^2*b/d*ln(c*x)*ln(1+I*c*x)-I*c^2*b/d*ln(c*x)-1/2*I*c^2*b/d
*ln(-1/2*I*(I+c*x))*ln(c*x-I)+1/2*I*c^2*b/d*dilog(1-I*c*x)+1/4*I*c^2*b/d*ln
(c*x-I)^2+I*c*a/d/x+1/2*I*c^2*b/d*ln(c*x)*ln(1-I*c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\left(\frac{2\,c^2\log\left(i\,cx+1\right)}{d}-\frac{2\,c^2\log(x)}{d}+\frac{2i\,cx-1}{dx^2}\right)a+\left(-i\,c\int\frac{\arctan\left(cx\right)}{c^2dx^4+dx^2}\,dx+\int\frac{\arctan\left(cx\right)}{c^2dx^5+dx^3}\,dx\right)b$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] 1/2*(2*c^2*log(I*c*x + 1)/d - 2*c^2*log(x)/d + (2*I*c*x - 1)/(d*x^2))*a + (
-I*c*integrate(arctan(c*x)/(c^2*d*x^4 + d*x^2), x) + integrate(arctan(c*x)/
(c^2*d*x^5 + d*x^3), x))*b
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^3\,\left(d+c\,d\,x\,1\mathrm{i}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a}{cx^4-ix^3}\,dx+\int \frac{b\,\mathrm{atan}\,(cx)}{cx^4-ix^3}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a/(c*x**4 - I*x**3), x) + Integral(b*atan(c*x)/(c*x**4 - I*x**
3), x))/d
```

3.50 $\int \frac{a+b\tan^{-1}(cx)}{x^4(d+icdx)}\,dx$

Optimal. Leaf size=197

$$\frac{ic^3\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{c^2\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{a+b\tan^{-1}(cx)}{3dx^3}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{2dx^2}-\frac{bc^3\mathrm{Li}_2\left(\frac{2}{icx+1}\right.}{2d}$$

[Out] -1/6*b*c/d/x^2+1/2*I*b*c^2/d/x+1/2*I*b*c^3*arctan(c*x)/d+1/3*(-a-b*arctan(c*x))/d/x^3+1/2*I*c*(a+b*arctan(c*x))/d/x^2+c^2*(a+b*arctan(c*x))/d/x-4/3*b*c^3*ln(x)/d+2/3*b*c^3*ln(c^2*x^2+1)/d+I*c^3*(a+b*arctan(c*x))*ln(2-2/(1+I*c*x))/d-1/2*b*c^3*polylog(2,-1+2/(1+I*c*x))/d

Rubi [A] time = 0.34, antiderivative size = 197, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {4870, 4852, 266, 44, 325, 203, 36, 29, 31, 4868, 2447}

$$-\frac{bc^3\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)}{2d}+\frac{c^2\left(a+b\tan^{-1}(cx)\right)}{dx}+\frac{ic^3\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{2dx^2}$$

Antiderivative was successfully verified.

[In] Int[(a + b*ArcTan[c*x])/(x^4*(d + I*c*d*x)),x]

[Out] -(b*c)/(6*d*x^2) + ((I/2)*b*c^2)/(d*x) + ((I/2)*b*c^3*ArcTan[c*x])/d - (a + b*ArcTan[c*x])/(3*d*x^3) + ((I/2)*c*(a + b*ArcTan[c*x]))/(d*x^2) + (c^2*(a + b*ArcTan[c*x]))/(d*x) - (4*b*c^3*Log[x])/(3*d) + (2*b*c^3*Log[1 + c^2*x^2])/(3*d) + (I*c^3*(a + b*ArcTan[c*x])*Log[2 - 2/(1 + I*c*x)])/d - (b*c^3*PolyLog[2, -1 + 2/(1 + I*c*x)])/(2*d)

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
 LtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^4(d+icdx)}\,dx = -\left((ic)\int \frac{a+b\tan^{-1}(cx)}{x^3(d+icdx)}\,dx\right) + \frac{\int \frac{a+b\tan^{-1}(cx)}{x^4}\,dx}{d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3} - c^2\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)}\,dx - \frac{(ic)\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d} + \frac{(bc)\int \frac{1}{x^3(1+c^2x^2)}}{3d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2dx^2} + \left(ic^3\right)\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)}\,dx + \frac{(bc)\,\mathrm{Subst}\left(\int\right.}{}$$

$$= \frac{ibc^2}{2dx} - \frac{a+b\tan^{-1}(cx)}{3dx^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2dx^2} + \frac{c^2\left(a+b\tan^{-1}(cx)\right)}{dx} + \frac{ic^3\left(a+b\tan^{-1}\right.}{}$$

$$= -\frac{bc}{6dx^2} + \frac{ibc^2}{2dx} + \frac{ibc^3\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{3dx^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2dx^2} + \frac{c^2\left(a+b\,\mathrm{ta}\right.}{dx}$$

$$= -\frac{bc}{6dx^2} + \frac{ibc^2}{2dx} + \frac{ibc^3\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{3dx^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2dx^2} + \frac{c^2\left(a+b\,\mathrm{ta}\right.}{dx}$$

$$= -\frac{bc}{6dx^2} + \frac{ibc^2}{2dx} + \frac{ibc^3\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{3dx^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2dx^2} + \frac{c^2\left(a+b\,\mathrm{ta}\right.}{dx}$$

Mathematica [C] time = 0.14, size = 254, normalized size = 1.29

$$\frac{6iac^3x^3\log(x) + 6iac^3x^3\log\left(\frac{2i}{-cx+i}\right) + 6ac^2x^2 + 3iacx - 2a - 3bc^3x^3\mathrm{Li}_2(-icx) + 3bc^3x^3\mathrm{Li}_2(icx) - 3bc^3x^3\mathrm{Li}_2\left(\frac{c}{c}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^4*(d + I*c*d*x)),x]
```

```
[Out] (-2*a + (3*I)*a*c*x - b*c*x + 6*a*c^2*x^2 - 2*b*ArcTan[c*x] + (3*I)*b*c*x*A
rcTan[c*x] + 6*b*c^2*x^2*ArcTan[c*x] + (3*I)*b*c^2*x^2*Hypergeometric2F1[-1
/2, 1, 1/2, -(c^2*x^2)] + (6*I)*a*c^3*x^3*Log[x] - 8*b*c^3*x^3*Log[x] + (6*
I)*a*c^3*x^3*Log[(2*I)/(I - c*x)] + (6*I)*b*c^3*x^3*ArcTan[c*x]*Log[(2*I)/(
I - c*x)] + 4*b*c^3*x^3*Log[1 + c^2*x^2] - 3*b*c^3*x^3*PolyLog[2, (-I)*c*x]
 + 3*b*c^3*x^3*PolyLog[2, I*c*x] - 3*b*c^3*x^3*PolyLog[2, (I + c*x)/(-I + c
*x)])/(6*d*x^3)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\log\left(-\frac{cx+i}{cx-i}\right) - 2i\,a}{2\,cdx^5 - 2i\,dx^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((b*log(-(c*x + I)/(c*x - I)) - 2*I*a)/(2*c*d*x^5 - 2*I*d*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arctan(c*x))/x^4/(d+I*c*d*x),x, algorithm="giac")

[Out] sage0*x

maple [B] time = 0.08, size = 369, normalized size = 1.87

$$-\frac{a}{3d\,x^{3}}+\frac{ica}{2d\,x^{2}}+\frac{icb\arctan\left(cx\right)}{2d\,x^{2}}+\frac{c^{2}a}{dx}+\frac{ic^{3}b\arctan\left(cx\right)\ln\left(cx\right)}{d}+\frac{c^{3}a\arctan\left(cx\right)}{d}-\frac{b\arctan\left(cx\right)}{3d\,x^{3}}+\frac{ib\,c^{2}}{2dx}+\frac{ib\,c^{3}\arctan}{2d}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*arctan(c*x))/x^4/(d+I*c*d*x),x)

[Out] -1/3*a/d/x^3+1/2*I*c*a/d/x^2+1/2*I*c*b/d*arctan(c*x)/x^2+c^2*a/d/x+I*c^3*b/d*arctan(c*x)*ln(c*x)+c^3*a/d*arctan(c*x)-1/3*b/d*arctan(c*x)/x^3+1/2*I*b*c^2/d/x+1/2*I*b*c^3*arctan(c*x)/d+c^2*b/d*arctan(c*x)/x+I*c^3*a/d*ln(c*x)-1/2*c^3*b/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/2*c^3*b/d*dilog(-1/2*I*(I+c*x))+1/4*c^3*b/d*ln(c*x-I)^2-1/2*c^3*b/d*ln(c*x)*ln(1+I*c*x)+1/2*c^3*b/d*ln(c*x)*ln(1-I*c*x)-1/2*c^3*b/d*dilog(1+I*c*x)+1/2*c^3*b/d*dilog(1-I*c*x)-I*c^3*b/d*arctan(c*x)*ln(c*x-I)-1/6*b*c/d/x^2-4/3*c^3*b/d*ln(c*x)+2/3*b*c^3*ln(c^2*x^2+1)/d-1/2*I*c^3*a/d*ln(c^2*x^2+1)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}\left(\frac{6i\,c^{3}\log\left(i\,cx+1\right)}{d}-\frac{6i\,c^{3}\log(x)}{d}-\frac{6\,c^{2}x^{2}+3i\,cx-2}{dx^{3}}\right)a+\left(-i\,c\int\frac{\arctan\left(cx\right)}{c^{2}dx^{5}+dx^{3}}\,dx+\int\frac{\arctan\left(cx\right)}{c^{2}dx^{6}+dx^{4}}\,dx\right)b$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*arctan(c*x))/x^4/(d+I*c*d*x),x, algorithm="maxima")

[Out] -1/6*(6*I*c^3*log(I*c*x + 1)/d - 6*I*c^3*log(x)/d - (6*c^2*x^2 + 3*I*c*x - 2)/(d*x^3))*a + (-I*c*integrate(arctan(c*x)/(c^2*d*x^5 + d*x^3), x) + integrate(arctan(c*x)/(c^2*d*x^6 + d*x^4), x))*b

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^{4}\,\left(d+c\,d\,x\,1\mathrm{i}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a + b*atan(c*x))/(x^4*(d + c*d*x*1i)),x)

[Out] int((a + b*atan(c*x))/(x^4*(d + c*d*x*1i)), x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a+b*atan(c*x))/x**4/(d+I*c*d*x),x)

[Out] Timed out

3.51 $\int \frac{x^3(a+b\tan^{-1}(cx))}{(d+icdx)^2}\,dx$

Optimal. Leaf size=203

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(-cx+i)}-\frac{3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^2}-\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d^2}-\frac{2iax}{c^3d^2}-\frac{3ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2c^4d^2}+\frac{b}{2c^4d^2(-cx}$$

```
[Out] -2*I*a*x/c^3/d^2+1/2*b*x/c^3/d^2+1/2*b/c^4/d^2/(I-c*x)-b*arctan(c*x)/c^4/d^
2-2*I*b*x*arctan(c*x)/c^3/d^2-1/2*x^2*(a+b*arctan(c*x))/c^2/d^2+I*(a+b*arct
an(c*x))/c^4/d^2/(I-c*x)-3*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^4/d^2+I*b*ln
(c^2*x^2+1)/c^4/d^2-3/2*I*b*polylog(2,1-2/(1+I*c*x))/c^4/d^2
```

Rubi [A] time = 0.22, antiderivative size = 203, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4876, 4846, 260, 4852, 321, 203, 4862, 627, 44, 4854, 2402, 2315}

$$-\frac{3ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c^4d^2}-\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(-cx+i)}-\frac{3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^2}-\frac{2iax}{c^3d^2}+$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^2,x]
```

```
[Out] ((-2*I)*a*x)/(c^3*d^2) + (b*x)/(2*c^3*d^2) + b/(2*c^4*d^2*(I - c*x)) - (b*A
rcTan[c*x])/(c^4*d^2) - ((2*I)*b*x*ArcTan[c*x])/(c^3*d^2) - (x^2*(a + b*Arc
Tan[c*x]))/(2*c^2*d^2) + (I*(a + b*ArcTan[c*x]))/(c^4*d^2*(I - c*x)) - (3*(
a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^4*d^2) + (I*b*Log[1 + c^2*x^2])/(
c^4*d^2) - (((3*I)/2)*b*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^4*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^2}\,dx = \int\left(-\frac{2i\left(a+b\tan^{-1}(cx)\right)}{c^3d^2} - \frac{x\left(a+b\tan^{-1}(cx)\right)}{c^2d^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{c^3d^2(-i+cx)^2} + \frac{3\left(a+b\tan\right.}{c^3d^2(-}\right.$$

$$= \frac{i\int\frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{c^3d^2} - \frac{(2i)\int\left(a+b\tan^{-1}(cx)\right)dx}{c^3d^2} + \frac{3\int\frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{c^3d^2} - \frac{\int x\left(a+b\right.}{}$$

$$= -\frac{2iax}{c^3d^2} - \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(i-cx)} - \frac{3\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+i}\right.}{c^4d^2}$$

$$= -\frac{2iax}{c^3d^2} + \frac{bx}{2c^3d^2} - \frac{2ibx\tan^{-1}(cx)}{c^3d^2} - \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(i-cx)} - \frac{3}{}$$

$$= -\frac{2iax}{c^3d^2} + \frac{bx}{2c^3d^2} - \frac{b\tan^{-1}(cx)}{2c^4d^2} - \frac{2ibx\tan^{-1}(cx)}{c^3d^2} - \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2c^2d^2} + \frac{i\left(a+b\right.}{c^4d^2(}$$

$$= -\frac{2iax}{c^3d^2} + \frac{bx}{2c^3d^2} + \frac{b}{2c^4d^2(i-cx)} - \frac{b\tan^{-1}(cx)}{2c^4d^2} - \frac{2ibx\tan^{-1}(cx)}{c^3d^2} - \frac{x^2\left(a+b\tan^{-1}\right.}{2c^2d^2}$$

$$= -\frac{2iax}{c^3d^2} + \frac{bx}{2c^3d^2} + \frac{b}{2c^4d^2(i-cx)} - \frac{b\tan^{-1}(cx)}{c^4d^2} - \frac{2ibx\tan^{-1}(cx)}{c^3d^2} - \frac{x^2\left(a+b\tan^{-1}\right.}{2c^2d^2}$$

Mathematica [A] time = 1.04, size = 186, normalized size = 0.92

$$-\frac{2ac^2x^2 - 6a\log\left(c^2x^2+1\right) + 8iacx + \frac{4ia}{cx-i} - 12ia\tan^{-1}(cx) + b\left(-4i\log\left(c^2x^2+1\right) + 2\tan^{-1}(cx)\left(c^2x^2+4icx\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^2,x]
```

```
[Out] -1/4*((8*I)*a*c*x + 2*a*c^2*x^2 + ((4*I)*a)/(-I + c*x) - (12*I)*a*ArcTan[c*
x] - 6*a*Log[1 + c^2*x^2] + b*(-2*c*x - (12*I)*ArcTan[c*x]^2 + I*Cos[2*ArcT
an[c*x]] - (4*I)*Log[1 + c^2*x^2] - (6*I)*PolyLog[2, -E^((2*I)*ArcTan[c*x])
] + 2*ArcTan[c*x]*(1 + (4*I)*c*x + c^2*x^2 - Cos[2*ArcTan[c*x]] + 6*Log[1 +
 E^((2*I)*ArcTan[c*x])] + I*Sin[2*ArcTan[c*x]]) + Sin[2*ArcTan[c*x]]))/(c^4
*d^2)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,bx^3\log\left(-\frac{cx+i}{cx-i}\right) - 2\,ax^3}{2\left(c^2d^2x^2 - 2i\,cd^2x - d^2\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-I*b*x^3*log(-(c*x + I)/(c*x - I)) - 2*a*x^3)/(c^2*d^2*x^2 -
2*I*c*d^2*x - d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.07, size = 367, normalized size = 1.81

$$-\frac{2iax}{c^3d^2}-\frac{a\,x^2}{2c^2d^2}-\frac{3ib\,\mathrm{dilog}\left(-\frac{i(cx+i)}{2}\right)}{2c^4d^2}+\frac{3a\ln\left(c^2x^2+1\right)}{2c^4d^2}+\frac{3ia\arctan\left(cx\right)}{c^4d^2}-\frac{ib}{2c^4d^2}-\frac{b\arctan\left(cx\right)x^2}{2c^2d^2}-\frac{2ibx\arctan\left(cx\right)}{c^3d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x)
```

```
[Out] -3/2*I/c^4*b/d^2*dilog(-1/2*I*(I+c*x))-1/2/c^2*a/d^2*x^2-2*I*a*x/c^3/d^2+3/
2/c^4*a/d^2*ln(c^2*x^2+1)+3*I/c^4*a/d^2*arctan(c*x)-1/2*I/c^4*b/d^2-1/2/c^2
*b/d^2*arctan(c*x)*x^2-2*I*b*x*arctan(c*x)/c^3/d^2+3/c^4*b/d^2*arctan(c*x)*
ln(c*x-I)+3/4*I/c^4*b/d^2*ln(c*x-I)^2-I/c^4*b/d^2*arctan(c*x)/(c*x-I)+1/8*I
/c^4*b/d^2*ln(c^4*x^4+10*c^2*x^2+9)+1/2*b*x/c^3/d^2+3/4*I/c^4*b/d^2*ln(c^2*
x^2+1)-I/c^4*a/d^2/(c*x-I)-1/4/c^4*b/d^2*arctan(1/2*c*x)+1/4/c^4*b/d^2*arct
an(1/6*c^3*x^3+7/6*c*x)+1/2/c^4*b/d^2*arctan(1/2*c*x-1/2*I)-1/2/c^4*b/d^2/(
c*x-I)-3/2*I/c^4*b/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-3/2*b*arctan(c*x)/d^2/c
^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*I/(c^5*d^2*x - I*c^4*d^2) + (c*x^2 + 4*I*x)/(c^3*d^2) - 6*log(c*x
 - I)/(c^4*d^2)) - 1/128*(-16*I*c^3*x^3 + 80*c^2*x^2 + 16*c*x*(2*arctan2(1,
 c*x) - 6*I) + 192*(-I*c*x - 1)*arctan(c*x)^2 + 48*(-I*c*x - 1)*log(c^2*x^2
 + 1)^2 + 48*(c^5*d^2*x - I*c^4*d^2)*((c*(x/(c^7*d^2*x^2 + c^5*d^2) + arcta
n(c*x)/(c^6*d^2)) - 2*arctan(c*x)/(c^7*d^2*x^2 + c^5*d^2))*c + 16*integrate
(1/8*log(c^2*x^2 + 1)/(c^7*d^2*x^4 + 2*c^5*d^2*x^2 + c^3*d^2), x)) + (48*I*
c^5*d^2*x + 48*c^4*d^2)*(c*(c^2/(c^9*d^2*x^2 + c^7*d^2) + log(c^2*x^2 + 1)/
(c^7*d^2*x^2 + c^5*d^2)) + 32*integrate(1/8*arctan(c*x)/(c^7*d^2*x^4 + 2*c^
5*d^2*x^2 + c^3*d^2), x)) - 96*(c^6*d^2*x - I*c^5*d^2)*(c*(x/(c^7*d^2*x^2 +
 c^5*d^2) + arctan(c*x)/(c^6*d^2)) - 16*c*integrate(1/8*x^2*log(c^2*x^2 + 1
)/(c^7*d^2*x^4 + 2*c^5*d^2*x^2 + c^3*d^2), x) - 2*arctan(c*x)/(c^7*d^2*x^2
+ c^5*d^2)) - (-96*I*c^6*d^2*x - 96*c^5*d^2)*(32*c*integrate(1/8*x^2*arctan
(c*x)/(c^7*d^2*x^4 + 2*c^5*d^2*x^2 + c^3*d^2), x) - c^2/(c^9*d^2*x^2 + c^7*
d^2) - log(c^2*x^2 + 1)/(c^7*d^2*x^2 + c^5*d^2)) + 16*(2*c^3*x^3 + 6*I*c^2*
x^2 + 8*c*x + 4*I)*arctan(c*x) + 256*(c^9*d^2*x - I*c^8*d^2)*integrate(1/8*
(2*c*x^5*arctan(c*x) + x^4*log(c^2*x^2 + 1))/(c^7*d^2*x^4 + 2*c^5*d^2*x^2 +
 c^3*d^2), x) - 16*(16*I*c^9*d^2*x + 16*c^8*d^2)*integrate(1/8*(c*x^5*log(c
^2*x^2 + 1) - 2*x^4*arctan(c*x))/(c^7*d^2*x^4 + 2*c^5*d^2*x^2 + c^3*d^2), x
) - 16*(-16*I*c^8*d^2*x - 16*c^7*d^2)*integrate(1/8*(2*c*x^4*arctan(c*x) +
x^3*log(c^2*x^2 + 1))/(c^7*d^2*x^4 + 2*c^5*d^2*x^2 + c^3*d^2), x) + 256*(c^
8*d^2*x - I*c^7*d^2)*integrate(1/8*(c*x^4*log(c^2*x^2 + 1) - 2*x^3*arctan(c
*x))/(c^7*d^2*x^4 + 2*c^5*d^2*x^2 + c^3*d^2), x) - 768*(c^7*d^2*x - I*c^6*d
^2)*integrate(1/8*(2*c*x^3*arctan(c*x) + x^2*log(c^2*x^2 + 1))/(c^7*d^2*x^4
 + 2*c^5*d^2*x^2 + c^3*d^2), x) - 16*(-48*I*c^7*d^2*x - 48*c^6*d^2)*integra
te(1/8*(c*x^3*log(c^2*x^2 + 1) - 2*x^2*arctan(c*x))/(c^7*d^2*x^4 + 2*c^5*d^
2*x^2 + c^3*d^2), x) - 16*(-I*c^3*x^3 + 3*c^2*x^2 - I*c*x + 5)*log(c^2*x^2
+ 1) - 32*I*arctan2(1, c*x))*b/(c^5*d^2*x - I*c^4*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + c*d*x*1i)^2,x)
```

```
[Out] int((x^3*(a + b*atan(c*x)))/(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(d+I*c*d*x)**2,x)
```

```
[Out] Timed out
```

3.52 $\int \frac{x^2(a+b\tan^{-1}(cx))}{(d+icdx)^2}\,dx$

Optimal. Leaf size=167

$$\frac{a+b\tan^{-1}(cx)}{c^3d^2(-cx+i)}+\frac{2i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^2}-\frac{ax}{c^2d^2}-\frac{b\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{c^3d^2}-\frac{ib}{2c^3d^2(-cx+i)}+\frac{ib\tan^{-1}(cx)}{2c^3d^2}-\frac{bx\tan^{-1}}{c^2d^2}$$

```
[Out] -a*x/c^2/d^2-1/2*I*b/c^3/d^2/(I-c*x)+1/2*I*b*arctan(c*x)/c^3/d^2-b*x*arctan
(c*x)/c^2/d^2+(a+b*arctan(c*x))/c^3/d^2/(I-c*x)+2*I*(a+b*arctan(c*x))*ln(2/
(1+I*c*x))/c^3/d^2+1/2*b*ln(c^2*x^2+1)/c^3/d^2-b*polylog(2,1-2/(1+I*c*x))/c
^3/d^2
```

Rubi [A] time = 0.19, antiderivative size = 167, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4846, 260, 4862, 627, 44, 203, 4854, 2402, 2315}

$$-\frac{b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^3d^2}+\frac{a+b\tan^{-1}(cx)}{c^3d^2(-cx+i)}+\frac{2i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^2}-\frac{ax}{c^2d^2}+\frac{b\log\left(c^2x^2+1\right)}{2c^3d^2}-\frac{ib}{2c^3d^2(-cx}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^2,x]
```

```
[Out] -((a*x)/(c^2*d^2)) - ((I/2)*b)/(c^3*d^2*(I - c*x)) + ((I/2)*b*ArcTan[c*x])/
(c^3*d^2) - (b*x*ArcTan[c*x])/(c^2*d^2) + (a + b*ArcTan[c*x])/(c^3*d^2*(I -
 c*x)) + ((2*I)*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^3*d^2) + (b*Log[
1 + c^2*x^2])/(2*c^3*d^2) - (b*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^3*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^2}\,dx=\int\left(-\frac{a+b\tan^{-1}(cx)}{c^2d^2}+\frac{a+b\tan^{-1}(cx)}{c^2d^2(-i+cx)^2}-\frac{2i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(-i+cx)}\right)dx$$

$$=-\frac{(2i)\int\frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{c^2d^2}-\frac{\int\left(a+b\tan^{-1}(cx)\right)dx}{c^2d^2}+\frac{\int\frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{c^2d^2}$$

$$=-\frac{ax}{c^2d^2}+\frac{a+b\tan^{-1}(cx)}{c^3d^2(i-cx)}+\frac{2i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^3d^2}-\frac{(2ib)\int\frac{\log\left(\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{c^2d^2}$$

$$=-\frac{ax}{c^2d^2}-\frac{bx\tan^{-1}(cx)}{c^2d^2}+\frac{a+b\tan^{-1}(cx)}{c^3d^2(i-cx)}+\frac{2i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^3d^2}-\frac{(2b)\ldots}{\ldots}$$

$$=-\frac{ax}{c^2d^2}-\frac{bx\tan^{-1}(cx)}{c^2d^2}+\frac{a+b\tan^{-1}(cx)}{c^3d^2(i-cx)}+\frac{2i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^3d^2}+\frac{b\,\mathrm{lo}\ldots}{\ldots}$$

$$=-\frac{ax}{c^2d^2}-\frac{ib}{2c^3d^2(i-cx)}-\frac{bx\tan^{-1}(cx)}{c^2d^2}+\frac{a+b\tan^{-1}(cx)}{c^3d^2(i-cx)}+\frac{2i\left(a+b\tan^{-1}(cx)\right)\mathrm{lo}\ldots}{c^3d^2}$$

$$=-\frac{ax}{c^2d^2}-\frac{ib}{2c^3d^2(i-cx)}+\frac{ib\tan^{-1}(cx)}{2c^3d^2}-\frac{bx\tan^{-1}(cx)}{c^2d^2}+\frac{a+b\tan^{-1}(cx)}{c^3d^2(i-cx)}+\frac{2i\left(a+\ldots\right.}{\ldots}$$

Mathematica [A] time = 0.81, size = 153, normalized size = 0.92

$$-\frac{4ia\log\left(c^2x^2+1\right)+4acx+\frac{4a}{cx-i}-8a\tan^{-1}(cx)+b\left(-2\log\left(c^2x^2+1\right)-4\text{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right)-8\tan^{-1}(cx)^2-i\sin\ldots\right.}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^2,x]
```

```
[Out] -1/4*(4*a*c*x + (4*a)/(-I + c*x) - 8*a*ArcTan[c*x] + (4*I)*a*Log[1 + c^2*x^
2] + b*(-8*ArcTan[c*x]^2 + Cos[2*ArcTan[c*x]] - 2*Log[1 + c^2*x^2] - 4*Poly
Log[2, -E^((2*I)*ArcTan[c*x])] - I*Sin[2*ArcTan[c*x]] + 2*ArcTan[c*x]*(2*c*
x + I*Cos[2*ArcTan[c*x]] - (4*I)*Log[1 + E^((2*I)*ArcTan[c*x])] + Sin[2*Arc
Tan[c*x]])))/(c^3*d^2)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,bx^2\log\left(-\frac{cx+i}{cx-i}\right)-2\,ax^2}{2\left(c^2d^2x^2-2i\,cd^2x-d^2\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-I*b*x^2*log(-(c*x + I)/(c*x - I)) - 2*a*x^2)/(c^2*d^2*x^2 -
2*I*c*d^2*x - d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.08, size = 316, normalized size = 1.89

$$-\frac{ax}{c^2d^2}-\frac{a}{c^3d^2\left(cx-i\right)}+\frac{2a\arctan\left(cx\right)}{c^3d^2}-\frac{ib\arctan\left(\frac{1}{6}c^3x^3+\frac{7}{6}cx\right)}{8c^3d^2}-\frac{bx\arctan\left(cx\right)}{c^2d^2}-\frac{b\arctan\left(cx\right)}{c^3d^2\left(cx-i\right)}-\frac{2ib\arctan\left(cx\right)\ln\left(\ldots\right.}{c^3d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x)
```

```
[Out] -a*x/c^2/d^2-1/c^3*a/d^2/(c*x-I)+2/c^3*a/d^2*arctan(c*x)-1/8*I/c^3*b/d^2*ar
ctan(1/6*c^3*x^3+7/6*c*x)-b*x*arctan(c*x)/c^2/d^2-1/c^3*b/d^2*arctan(c*x)/(
c*x-I)-2*I/c^3*b/d^2*arctan(c*x)*ln(c*x-I)-1/c^3*b/d^2*ln(c*x-I)*ln(-1/2*I*
(I+c*x))-1/c^3*b/d^2*dilog(-1/2*I*(I+c*x))+1/2/c^3*b/d^2*ln(c*x-I)^2+1/16/c
^3*b/d^2*ln(c^4*x^4+10*c^2*x^2+9)+1/8*I/c^3*b/d^2*arctan(1/2*c*x)-1/4*I/c^3
*b/d^2*arctan(1/2*c*x-1/2*I)+1/2*I/c^3*b/d^2/(c*x-I)-I/c^3*a/d^2*ln(c^2*x^2
+1)+3/8*b*ln(c^2*x^2+1)/c^3/d^2+3/4*I/c^3*b/d^2*arctan(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] -a*(1/(c^4*d^2*x - I*c^3*d^2) + x/(c^2*d^2) + 2*I*log(c*x - I)/(c^3*d^2)) -
 1/32*(-16*I*c^2*x^2 - 8*(4*c*x - 4*I)*arctan(c*x)^2 - 8*(c*x - I)*log(c^2*
x^2 + 1)^2 - (8*I*c^4*d^2*x + 8*c^3*d^2)*((c*(x/(c^6*d^2*x^2 + c^4*d^2) + a
rctan(c*x)/(c^5*d^2)) - 2*arctan(c*x)/(c^6*d^2*x^2 + c^4*d^2))*c + 8*integr
ate(1/4*log(c^2*x^2 + 1)/(c^6*d^2*x^4 + 2*c^4*d^2*x^2 + c^2*d^2), x)) + 8*(
c^4*d^2*x - I*c^3*d^2)*(c*(c^2/(c^8*d^2*x^2 + c^6*d^2) + log(c^2*x^2 + 1)/(
c^6*d^2*x^2 + c^4*d^2)) + 16*integrate(1/4*arctan(c*x)/(c^6*d^2*x^4 + 2*c^4
*d^2*x^2 + c^2*d^2), x)) + (16*I*c^5*d^2*x + 16*c^4*d^2)*(c*(x/(c^6*d^2*x^2
 + c^4*d^2) + arctan(c*x)/(c^5*d^2)) - 8*c*integrate(1/4*x^2*log(c^2*x^2 +
1)/(c^6*d^2*x^4 + 2*c^4*d^2*x^2 + c^2*d^2), x) - 2*arctan(c*x)/(c^6*d^2*x^2
 + c^4*d^2)) + 16*(c^5*d^2*x - I*c^4*d^2)*(16*c*integrate(1/4*x^2*arctan(c*
x)/(c^6*d^2*x^4 + 2*c^4*d^2*x^2 + c^2*d^2), x) - c^2/(c^8*d^2*x^2 + c^6*d^2
) - log(c^2*x^2 + 1)/(c^6*d^2*x^2 + c^4*d^2)) - 16*c*x + 16*(c^2*x^2 - I*c*
x + 1)*arctan(c*x) + 32*(c^7*d^2*x - I*c^6*d^2)*integrate(1/4*(2*c*x^4*arct
an(c*x) + x^3*log(c^2*x^2 + 1))/(c^6*d^2*x^4 + 2*c^4*d^2*x^2 + c^2*d^2), x)
 - 8*(4*I*c^7*d^2*x + 4*c^6*d^2)*integrate(1/4*(c*x^4*log(c^2*x^2 + 1) - 2*
x^3*arctan(c*x))/(c^6*d^2*x^4 + 2*c^4*d^2*x^2 + c^2*d^2), x) - 8*(-12*I*c^6
*d^2*x - 12*c^5*d^2)*integrate(1/4*(2*c*x^3*arctan(c*x) + x^2*log(c^2*x^2 +
 1))/(c^6*d^2*x^4 + 2*c^4*d^2*x^2 + c^2*d^2), x) + 96*(c^6*d^2*x - I*c^5*d^
2)*integrate(1/4*(c*x^3*log(c^2*x^2 + 1) - 2*x^2*arctan(c*x))/(c^6*d^2*x^4
+ 2*c^4*d^2*x^2 + c^2*d^2), x) - 8*(-I*c^2*x^2 - 2*I)*log(c^2*x^2 + 1))*b/(
c^4*d^2*x - I*c^3*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + c*d*x*1i)^2,x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(d+I*c*d*x)**2,x)
```

```
[Out] Timed out
```

3.53 $\int \frac{x(a+b\tan^{-1}(cx))}{(d+icdx)^2}\,dx$

Optimal. Leaf size=122

$$-\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(-cx+i)}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d^2}+\frac{ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2c^2d^2}-\frac{b}{2c^2d^2(-cx+i)}+\frac{b\tan^{-1}(cx)}{2c^2d^2}$$

```
[Out] -1/2*b/c^2/d^2/(I-c*x)+1/2*b*arctan(c*x)/c^2/d^2-I*(a+b*arctan(c*x))/c^2/d^
2/(I-c*x)+(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^2/d^2+1/2*I*b*polylog(2,1-2/(
1+I*c*x))/c^2/d^2
```

Rubi [A] time = 0.15, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4876, 4862, 627, 44, 203, 4854, 2402, 2315}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c^2d^2}-\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(-cx+i)}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d^2}-\frac{b}{2c^2d^2(-cx+i)}+\frac{b\tan^{-1}(cx)}{2c^2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^2,x]
```

```
[Out] -b/(2*c^2*d^2*(I - c*x)) + (b*ArcTan[c*x])/(2*c^2*d^2) - (I*(a + b*ArcTan[c
*x]))/(c^2*d^2*(I - c*x)) + ((a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^2*d
^2) + ((I/2)*b*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^2*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^2}\,dx = \int \left(-\frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(-i+cx)^2}-\frac{a+b\tan^{-1}(cx)}{cd^2(-i+cx)}\right)dx$$

$$= -\frac{i\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{cd^2}-\frac{\int \frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{cd^2}$$

$$= -\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d^2}-\frac{(ib)\int \frac{1}{(-i+cx)\left(1+c^2x^2\right)}\,dx}{cd^2}-\frac{b}{}$$

$$= -\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d^2}+\frac{(ib)\operatorname{Subst}\left(\int \frac{\log(2x)}{1-2x}\,dx,x,\right.}{c^2d^2}$$

$$= -\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d^2}+\frac{ib\operatorname{Li}_2\left(1-\frac{2}{1+icx}\right)}{2c^2d^2}-\frac{(ib)\int\left(\right.}{}$$

$$= -\frac{b}{2c^2d^2(i-cx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d^2}+\frac{ib\operatorname{Li}_2\left(1-\right.}{2c^2d^2}$$

$$= -\frac{b}{2c^2d^2(i-cx)}+\frac{b\tan^{-1}(cx)}{2c^2d^2}-\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d^2}$$

Mathematica [A] time = 0.10, size = 128, normalized size = 1.05

$$-\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(-cx+i)}+\frac{\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d^2}+\frac{ib\operatorname{Li}_2\left(-\frac{cx+i}{i-cx}\right)}{2c^2d^2}-\frac{b\left(-\frac{\tan^{-1}(cx)}{c}+\frac{1}{c(-cx+i)}\right)}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^2,x]
```

```
[Out] ((-I)*(a + b*ArcTan[c*x]))/(c^2*d^2*(I - c*x)) - (b*(1/(c*(I - c*x)) - ArcT
an[c*x]/c))/(2*c*d^2) + ((a + b*ArcTan[c*x])*Log[(2*I)/(I - c*x)])/(c^2*d^2
) + ((I/2)*b*PolyLog[2, -((I + c*x)/(I - c*x))])/(c^2*d^2)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,bx\log\left(-\frac{cx+i}{cx-i}\right)-2\,ax}{2\left(c^2d^2x^2-2i\,cd^2x-d^2\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-I*b*x*log(-(c*x + I)/(c*x - I)) - 2*a*x)/(c^2*d^2*x^2 - 2*I*
c*d^2*x - d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.06, size = 293, normalized size = 2.40

$$\frac{ia}{c^2d^2\left(cx-i\right)}-\frac{a\ln\left(c^2x^2+1\right)}{2c^2d^2}-\frac{ia\arctan\left(cx\right)}{c^2d^2}+\frac{ib\arctan\left(cx\right)}{c^2d^2\left(cx-i\right)}-\frac{b\arctan\left(cx\right)\ln\left(cx-i\right)}{c^2d^2}+\frac{ib\ln\left(c^4x^4+10c^2x^2+9\right)}{16c^2d^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x)
```

```
[Out] I/c^2*a/d^2/(c*x-I)-1/2/c^2*a/d^2*ln(c^2*x^2+1)-I/c^2*a/d^2*arctan(c*x)+I/c
^2*b/d^2*arctan(c*x)/(c*x-I)-1/c^2*b/d^2*arctan(c*x)*ln(c*x-I)+1/16*I/c^2*b
/d^2*ln(c^4*x^4+10*c^2*x^2+9)-1/8/c^2*b/d^2*arctan(1/2*c*x)+1/8/c^2*b/d^2*a
rctan(1/6*c^3*x^3+7/6*c*x)+1/4/c^2*b/d^2*arctan(1/2*c*x-1/2*I)+1/2/c^2*b/d^
2/(c*x-I)-1/8*I/c^2*b/d^2*ln(c^2*x^2+1)+1/4*b*arctan(c*x)/c^2/d^2+1/2*I/c^2
*b/d^2*ln(-1/2*I*(I+c*x))*ln(c*x-I)+1/2*I/c^2*b/d^2*dilog(-1/2*I*(I+c*x))-1
/4*I/c^2*b/d^2*ln(c*x-I)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] a*(I/(c^3*d^2*x - I*c^2*d^2) - log(c*x - I)/(c^2*d^2)) - 1/64*(32*(I*c*x +
1)*arctan(c*x)^2 + 32*c*x*arctan2(1, c*x) - 8*(-I*c*x - 1)*log(c^2*x^2 + 1)
^2 - 8*(c^3*d^2*x - I*c^2*d^2)*((c*(x/(c^5*d^2*x^2 + c^3*d^2) + arctan(c*x)
/(c^4*d^2)) - 2*arctan(c*x)/(c^5*d^2*x^2 + c^3*d^2))*c + 8*integrate(1/4*lo
g(c^2*x^2 + 1)/(c^5*d^2*x^4 + 2*c^3*d^2*x^2 + c*d^2), x)) + (-8*I*c^3*d^2*x
 - 8*c^2*d^2)*(c*(c^2/(c^7*d^2*x^2 + c^5*d^2) + log(c^2*x^2 + 1)/(c^5*d^2*x
^2 + c^3*d^2)) + 16*integrate(1/4*arctan(c*x)/(c^5*d^2*x^4 + 2*c^3*d^2*x^2
+ c*d^2), x)) + 8*(c^4*d^2*x - I*c^3*d^2)*(c*(x/(c^5*d^2*x^2 + c^3*d^2) + a
rctan(c*x)/(c^4*d^2)) - 8*c*integrate(1/4*x^2*log(c^2*x^2 + 1)/(c^5*d^2*x^4
 + 2*c^3*d^2*x^2 + c*d^2), x) - 2*arctan(c*x)/(c^5*d^2*x^2 + c^3*d^2)) - (8
*I*c^4*d^2*x + 8*c^3*d^2)*(16*c*integrate(1/4*x^2*arctan(c*x)/(c^5*d^2*x^4
+ 2*c^3*d^2*x^2 + c*d^2), x) - c^2/(c^7*d^2*x^2 + c^5*d^2) - log(c^2*x^2 +
1)/(c^5*d^2*x^2 + c^3*d^2)) + 128*(c^5*d^2*x - I*c^4*d^2)*integrate(1/4*(2*
```

```
c*x^3*arctan(c*x) + x^2*log(c^2*x^2 + 1))/(c^5*d^2*x^4 + 2*c^3*d^2*x^2 + c*
d^2), x) - 8*(16*I*c^5*d^2*x + 16*c^4*d^2)*integrate(1/4*(c*x^3*log(c^2*x^2
 + 1) - 2*x^2*arctan(c*x))/(c^5*d^2*x^4 + 2*c^3*d^2*x^2 + c*d^2), x) - 32*I
*arctan(c*x) - 32*I*arctan2(1, c*x) + 16*log(c^2*x^2 + 1))*b/(c^3*d^2*x - I
*c^2*d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + c*d*x*1i)^2,x)
```

```
[Out] int((x*(a + b*atan(c*x)))/(d + c*d*x*1i)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(bcx\log\left(icx+1\right)-ib\log\left(icx+1\right)-ib\right)\log\left(-icx+1\right)}{2ic^3d^2x+2c^2d^2}-\frac{\int\frac{ib}{c^3x^3-ic^2x^2+cx-i}\,dx+\int\frac{ib\log\left(icx+1\right)}{c^3x^3-ic^2x^2+cx-i}\,dx+\int\frac{2ac^2x^2}{c^3x^3-ic^2x^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(d+I*c*d*x)**2,x)
```

```
[Out] (b*c*x*log(I*c*x + 1) - I*b*log(I*c*x + 1) - I*b)*log(-I*c*x + 1)/(2*I*c**3
*d**2*x + 2*c**2*d**2) - (Integral(I*b/(c**3*x**3 - I*c**2*x**2 + c*x - I),
 x) + Integral(I*b*log(I*c*x + 1)/(c**3*x**3 - I*c**2*x**2 + c*x - I), x) +
 Integral(2*a*c**2*x**2/(c**3*x**3 - I*c**2*x**2 + c*x - I), x) + Integral(
-b*c*x/(c**3*x**3 - I*c**2*x**2 + c*x - I), x) + Integral(2*I*a*c*x/(c**3*x
**3 - I*c**2*x**2 + c*x - I), x) + Integral(-b*c*x*log(I*c*x + 1)/(c**3*x**
3 - I*c**2*x**2 + c*x - I), x) + Integral(-2*I*b*c**2*x**2*log(I*c*x + 1)/(
c**3*x**3 - I*c**2*x**2 + c*x - I), x))/(2*c*d**2)
```

3.54 $\int \frac{a+b\tan^{-1}(cx)}{(d+icdx)^2}\,dx$

Optimal. Leaf size=69

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(1+icx)}+\frac{ib}{2cd^2(-cx+i)}-\frac{ib\tan^{-1}(cx)}{2cd^2}$$

```
[Out] 1/2*I*b/c/d^2/(I-c*x)-1/2*I*b*arctan(c*x)/c/d^2+I*(a+b*arctan(c*x))/c/d^2/(
1+I*c*x)
```

Rubi [A] time = 0.05, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4862, 627, 44, 203}

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(1+icx)}+\frac{ib}{2cd^2(-cx+i)}-\frac{ib\tan^{-1}(cx)}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + I*c*d*x)^2,x]
```

```
[Out] ((I/2)*b)/(c*d^2*(I - c*x)) - ((I/2)*b*ArcTan[c*x])/(c*d^2) + (I*(a + b*Arc
Tan[c*x]))/(c*d^2*(1 + I*c*x))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\tan^{-1}(cx)}{(d+icdx)^2}\,dx &= \frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(1+icx)} - \frac{(ib)\int \frac{1}{(d+icdx)\left(1+c^2x^2\right)}\,dx}{d} \\ &= \frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(1+icx)} - \frac{(ib)\int \frac{1}{\left(\frac{1}{d}-\frac{icx}{d}\right)(d+icdx)^2}\,dx}{d} \\ &= \frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(1+icx)} - \frac{(ib)\int \left(-\frac{1}{2d(-i+cx)^2}+\frac{1}{2d\left(1+c^2x^2\right)}\right)dx}{d} \\ &= \frac{ib}{2cd^2(i-cx)} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(1+icx)} - \frac{(ib)\int \frac{1}{1+c^2x^2}\,dx}{2d^2} \\ &= \frac{ib}{2cd^2(i-cx)} - \frac{ib\tan^{-1}(cx)}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{cd^2(1+icx)}\end{aligned}$$

Mathematica [A] time = 0.04, size = 42, normalized size = 0.61

$$\frac{2a+(b-ibcx)\tan^{-1}(cx)-ib}{2cd^2(cx-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + I*c*d*x)^2,x]
```

```
[Out] (2*a - I*b + (b - I*b*c*x)*ArcTan[c*x])/(2*c*d^2*(-I + c*x))
```

fricas [A] time = 0.49, size = 50, normalized size = 0.72

$$\frac{(bcx+i\,b)\log\left(-\frac{cx+i}{cx-i}\right)+4\,a-2i\,b}{4\,c^2d^2x-4i\,cd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] ((b*c*x + I*b)*log(-(c*x + I)/(c*x - I)) + 4*a - 2*I*b)/(4*c^2*d^2*x - 4*I*
c*d^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 76, normalized size = 1.10

$$\frac{ia}{c\,d^2\,(icx+1)}+\frac{ib\arctan(cx)}{c\,d^2\,(icx+1)}-\frac{ib\arctan(cx)}{2c\,d^2}-\frac{ib}{2c\,d^2\,(cx-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(d+I*c*d*x)^2,x)
```

```
[Out] I/c*a/d^2/(1+I*c*x)+I/c*b/d^2/(1+I*c*x)*arctan(c*x)-1/2*I*b*arctan(c*x)/c/d
^2-1/2*I/c*b/d^2/(c*x-I)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + c*d*x*1i)^2,x)
```

```
[Out] int((a + b*atan(c*x))/(d + c*d*x*1i)^2, x)
```

sympy [B] time = 1.94, size = 116, normalized size = 1.68

$$\frac{ib\log\left(-icx+1\right)}{2c^2d^2x-2icd^2}-\frac{ib\log\left(icx+1\right)}{2c^2d^2x-2icd^2}-\frac{b\left(\frac{\log\left(bx-\frac{ib}{c}\right)}{4}-\frac{\log\left(bx+\frac{ib}{c}\right)}{4}\right)}{cd^2}-\frac{-2a+ib}{2c^2d^2x-2icd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(d+I*c*d*x)**2,x)
```

```
[Out] I*b*log(-I*c*x + 1)/(2*c**2*d**2*x - 2*I*c*d**2) - I*b*log(I*c*x + 1)/(2*c*
*2*d**2*x - 2*I*c*d**2) - b*(log(b*x - I*b/c)/4 - log(b*x + I*b/c)/4)/(c*d*
*2) - (-2*a + I*b)/(2*c**2*d**2*x - 2*I*c*d**2)
```

3.55 $\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)^2}\,dx$

Optimal. Leaf size=150

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{a\log(x)}{d^2}+\frac{ib\text{Li}_2(-icx)}{2d^2}-\frac{ib\text{Li}_2(icx)}{2d^2}+\frac{ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2d^2}+\frac{}{2d^2(-}$$

```
[Out] 1/2*b/d^2/(I-c*x)-1/2*b*arctan(c*x)/d^2+I*(a+b*arctan(c*x))/d^2/(I-c*x)+a*l
n(x)/d^2+(a+b*arctan(c*x))*ln(2/(1+I*c*x))/d^2+1/2*I*b*polylog(2,-I*c*x)/d^
2-1/2*I*b*polylog(2,I*c*x)/d^2+1/2*I*b*polylog(2,1-2/(1+I*c*x))/d^2
```

Rubi [A] time = 0.19, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4848, 2391, 4862, 627, 44, 203, 4854, 2402, 2315}

$$\frac{ib\text{PolyLog}(2,-icx)}{2d^2}-\frac{ib\text{PolyLog}(2,icx)}{2d^2}+\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2d^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + I*c*d*x)^2),x]
```

```
[Out] b/(2*d^2*(I - c*x)) - (b*ArcTan[c*x])/(2*d^2) + (I*(a + b*ArcTan[c*x]))/(d^
2*(I - c*x)) + (a*Log[x])/d^2 + ((a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/d^
2 + ((I/2)*b*PolyLog[2, (-I)*c*x])/d^2 - ((I/2)*b*PolyLog[2, I*c*x])/d^2 +
((I/2)*b*PolyLog[2, 1 - 2/(1 + I*c*x)])/d^2
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)^2}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^2x}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{d^2(-i+cx)^2}-\frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(-i+cx)}\right)dx$$

$$=\frac{\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^2}+\frac{(ic)\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{d^2}-\frac{c\int \frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{d^2}$$

$$=\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)}+\frac{a\log(x)}{d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^2}+\frac{(ib)\int \frac{\log(1-icx)}{x}\,dx}{2d^2}-\frac{(ib)}{}$$

$$=\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)}+\frac{a\log(x)}{d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^2}+\frac{ib\text{Li}_2(-icx)}{2d^2}-\frac{ib\text{Li}_2(icx)}{2d^2}$$

$$=\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)}+\frac{a\log(x)}{d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^2}+\frac{ib\text{Li}_2(-icx)}{2d^2}-\frac{ib\text{Li}_2(icx)}{2d^2}$$

$$=\frac{b}{2d^2(i-cx)}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)}+\frac{a\log(x)}{d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^2}+\frac{ib\text{Li}_2(-icx)}{2d^2}$$

$$=\frac{b}{2d^2(i-cx)}-\frac{b\tan^{-1}(cx)}{2d^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)}+\frac{a\log(x)}{d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^2}$$

Mathematica [A] time = 0.16, size = 128, normalized size = 0.85

$$\frac{-\frac{2i(a+b\tan^{-1}(cx))}{cx-i}+2\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right)+2a\log(x)+ib\text{Li}_2(-icx)-ib\text{Li}_2(icx)+ib\text{Li}_2\left(\frac{cx+i}{cx-i}\right)+b\left(-\text{ta}\right.}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + I*c*d*x)^2),x]
```

```
[Out] (b*((I - c*x)^(-1) - ArcTan[c*x]) - ((2*I)*(a + b*ArcTan[c*x]))/(-I + c*x)
+ 2*a*Log[x] + 2*(a + b*ArcTan[c*x])*Log[(2*I)/(I - c*x)] + I*b*PolyLog[2,
(-I)*c*x] - I*b*PolyLog[2, I*c*x] + I*b*PolyLog[2, (I + c*x)/(-I + c*x)])/(
2*d^2)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,b\log\left(-\frac{cx+i}{cx-i}\right)-2\,a}{2\left(c^2d^2x^3-2i\,cd^2x^2-d^2x\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-I*b*log(-(c*x + I)/(c*x - I)) - 2*a)/(c^2*d^2*x^3 - 2*I*c*d^
2*x^2 - d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.08, size = 251, normalized size = 1.67

$$\frac{a\ln(cx)}{d^2}-\frac{ib\arctan(cx)}{d^2(cx-i)}-\frac{a\ln\left(c^2x^2+1\right)}{2d^2}+\frac{ib\,\text{dilog}\left(-\frac{i(cx+i)}{2}\right)}{2d^2}+\frac{b\ln(cx)\arctan(cx)}{d^2}+\frac{ib\,\text{dilog}(icx+1)}{2d^2}-\frac{b\,\text{arcta}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(d+I*c*d*x)^2,x)
```

```
[Out] a/d^2*ln(c*x)-I*b/d^2*arctan(c*x)/(c*x-I)-1/2*a/d^2*ln(c^2*x^2+1)+1/2*I*b/d
^2*dilog(1+I*c*x)+b/d^2*ln(c*x)*arctan(c*x)+1/2*I*b/d^2*ln(-1/2*I*(I+c*x))*
ln(c*x-I)-b/d^2*arctan(c*x)*ln(c*x-I)+1/2*I*b/d^2*ln(c*x)*ln(1+I*c*x)-I*a/d
^2*arctan(c*x)-1/4*I*b/d^2*ln(c*x-I)^2-1/2*I*b/d^2*ln(c*x)*ln(1-I*c*x)-1/2*
b*arctan(c*x)/d^2-1/2*b/d^2/(c*x-I)+1/2*I*b/d^2*dilog(-1/2*I*(I+c*x))-1/2*I
*b/d^2*dilog(1-I*c*x)-I*a/d^2/(c*x-I)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(-2i\,c\int\frac{\arctan(cx)}{c^4d^2x^4+2\,c^2d^2x^2+d^2}\,dx-\int\frac{\left(c^2x^2-1\right)\arctan(cx)}{c^4d^2x^5+2\,c^2d^2x^3+d^2x}\,dx\right)b+a\left(-\frac{i}{cd^2x-i\,d^2}-\frac{\log(cx-i)}{d^2}+\frac{\log(x}{d^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] (-2*I*c*integrate(arctan(c*x)/(c^4*d^2*x^4 + 2*c^2*d^2*x^2 + d^2), x) - int
egrate((c^2*x^2 - 1)*arctan(c*x)/(c^4*d^2*x^5 + 2*c^2*d^2*x^3 + d^2*x), x))
*b + a*(-I/(c*d^2*x - I*d^2) - log(c*x - I)/d^2 + log(x)/d^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + c*d*x*1i)^2),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + c*d*x*1i)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(d+I*c*d*x)**2,x)
```

```
[Out] Timed out
```

3.56 $\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)^2}\,dx$

Optimal. Leaf size=194

$$\frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}-\frac{a+b\tan^{-1}(cx)}{d^2x}-\frac{2ic\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{2iac\log(x)}{d^2}-\frac{bc\log\left(c^2x^2+1\right)}{2d^2}+\frac{bc\mathrm{Li}_2(}{d^2}$$

```
[Out] -1/2*I*b*c/d^2/(I-c*x)+1/2*I*b*c*arctan(c*x)/d^2+(-a-b*arctan(c*x))/d^2/x+c
*(a+b*arctan(c*x))/d^2/(I-c*x)-2*I*a*c*ln(x)/d^2+b*c*ln(x)/d^2-2*I*c*(a+b*a
rctan(c*x))*ln(2/(1+I*c*x))/d^2-1/2*b*c*ln(c^2*x^2+1)/d^2+b*c*polylog(2,-I*
c*x)/d^2-b*c*polylog(2,I*c*x)/d^2+b*c*polylog(2,1-2/(1+I*c*x))/d^2
```

Rubi [A] time = 0.24, antiderivative size = 194, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.652, Rules used = {4876, 4852, 266, 36, 29, 31, 4848, 2391, 4862, 627, 44, 203, 4854, 2402, 2315}

$$\frac{bc\text{PolyLog}(2,-icx)}{d^2}-\frac{bc\text{PolyLog}(2,icx)}{d^2}+\frac{bc\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{d^2}+\frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}-\frac{a+b\tan^{-1}(cx)}{d^2x}-\frac{2ic}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + I*c*d*x)^2),x]
```

```
[Out] ((-I/2)*b*c)/(d^2*(I - c*x)) + ((I/2)*b*c*ArcTan[c*x])/d^2 - (a + b*ArcTan[
c*x])/(d^2*x) + (c*(a + b*ArcTan[c*x]))/(d^2*(I - c*x)) - ((2*I)*a*c*Log[x]
)/d^2 + (b*c*Log[x])/d^2 - ((2*I)*c*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])
/d^2 - (b*c*Log[1 + c^2*x^2])/(2*d^2) + (b*c*PolyLog[2, (-I)*c*x])/d^2 - (b
*c*PolyLog[2, I*c*x])/d^2 + (b*c*PolyLog[2, 1 - 2/(1 + I*c*x)])/d^2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)^2}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^2x^2} - \frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x} + \frac{c^2\left(a+b\tan^{-1}(cx)\right)}{d^2(-i+cx)^2} + \frac{2ic^2\left(a+b\tan^{-1}\right.}{d^2(-i+cx)}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d^2} - \frac{(2ic)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^2} + \frac{\left(2ic^2\right)\int \frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{d^2} + \frac{c^2\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} + \frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2iac\log(x)}{d^2} - \frac{2ic\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+ic}\right.}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} + \frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2iac\log(x)}{d^2} - \frac{2ic\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+ic}\right.}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} + \frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2iac\log(x)}{d^2} - \frac{2ic\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+ic}\right.}{d^2}$$

$$= -\frac{ibc}{2d^2(i-cx)} - \frac{a+b\tan^{-1}(cx)}{d^2x} + \frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2iac\log(x)}{d^2} + \frac{bc\log(x)}{d^2} - \frac{2ic}{}$$

$$= -\frac{ibc}{2d^2(i-cx)} + \frac{ibc\tan^{-1}(cx)}{2d^2} - \frac{a+b\tan^{-1}(cx)}{d^2x} + \frac{c\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2iac\log(x)}{d^2} +$$

Mathematica [A] time = 0.31, size = 165, normalized size = 0.85

$$-\frac{\frac{2\left(a+b\tan^{-1}(cx)\right)}{x} + \frac{2c\left(a+b\tan^{-1}(cx)\right)}{cx-i} + 4ic\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right) + 4iac\log(x) + bc\left(\log\left(c^2x^2+1\right) - 2\log(x\right.}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + I*c*d*x)^2),x]
```

```
[Out] -1/2*(I*b*c*((I - c*x)^(-1) - ArcTan[c*x]) + (2*(a + b*ArcTan[c*x]))/x + (2
*c*(a + b*ArcTan[c*x]))/(-I + c*x) + (4*I)*a*c*Log[x] + (4*I)*c*(a + b*ArcT
an[c*x])*Log[(2*I)/(I - c*x)] + b*c*(-2*Log[x] + Log[1 + c^2*x^2]) - 2*b*c*
PolyLog[2, (-I)*c*x] + 2*b*c*PolyLog[2, I*c*x] - 2*b*c*PolyLog[2, (I + c*x)
/(-I + c*x)])/d^2
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,b\log\left(-\frac{cx+i}{cx-i}\right) - 2\,a}{2\left(c^2d^2x^4 - 2i\,cd^2x^3 - d^2x^2\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-I*b*log(-(c*x + I)/(c*x - I)) - 2*a)/(c^2*d^2*x^4 - 2*I*c*d^
2*x^3 - d^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.08, size = 340, normalized size = 1.75

$$-\frac{a}{d^2x}+\frac{ica\ln\left(c^2x^2+1\right)}{d^2}-\frac{ca}{d^2\left(cx-i\right)}-\frac{2ca\arctan\left(cx\right)}{d^2}+\frac{icb}{2d^2\left(cx-i\right)}-\frac{b\arctan\left(cx\right)}{d^2x}+\frac{ibc\arctan\left(cx\right)}{2d^2}-\frac{cb\arctan\left(cx\right)}{d^2\left(cx-i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^2,x)
```

```
[Out] -a/d^2/x+I*c*a/d^2*ln(c^2*x^2+1)-c*a/d^2/(c*x-I)-2*c*a/d^2*arctan(c*x)+1/2*
I*c*b/d^2/(c*x-I)-b/d^2*arctan(c*x)/x+1/2*I*b*c*arctan(c*x)/d^2-c*b/d^2*arc
tan(c*x)/(c*x-I)-2*I*c*a/d^2*ln(c*x)-c*b/d^2*dilog(-I*(I+c*x))-c*b/d^2*ln(c
*x)*ln(-I*(I+c*x))+c*b/d^2*ln(-I*(-c*x+I))*ln(c*x)-c*b/d^2*ln(-I*(-c*x+I))*
ln(-I*c*x)-c*b/d^2*dilog(-I*c*x)+c*b/d^2*dilog(-1/2*I*(I+c*x))+c*b/d^2*ln(c
*x-I)*ln(-1/2*I*(I+c*x))-1/2*c*b/d^2*ln(c*x-I)^2+c*b/d^2*ln(c*x)-1/2*b*c*ln
(c^2*x^2+1)/d^2+2*I*c*b/d^2*arctan(c*x)*ln(c*x-I)-2*I*c*b/d^2*arctan(c*x)*l
n(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(-2ic\int\frac{\arctan\left(cx\right)}{c^4d^2x^5+2\,c^2d^2x^3+d^2x}\,dx-\int\frac{\left(c^2x^2-1\right)\arctan\left(cx\right)}{c^4d^2x^6+2\,c^2d^2x^4+d^2x^2}\,dx\right)b-a\left(\frac{c}{cd^2x-i\,d^2}-\frac{2i\,c\log\left(cx-i\right)}{d^2}+\frac{2i\,c\,l}{c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] (-2*I*c*integrate(arctan(c*x)/(c^4*d^2*x^5 + 2*c^2*d^2*x^3 + d^2*x), x) - i
ntegrate((c^2*x^2 - 1)*arctan(c*x)/(c^4*d^2*x^6 + 2*c^2*d^2*x^4 + d^2*x^2),
 x))*b - a*(c/(c*d^2*x - I*d^2) - 2*I*c*log(c*x - I)/d^2 + 2*I*c*log(x)/d^2
 + 1/(d^2*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^2\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + c*d*x*1i)^2),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + c*d*x*1i)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(d+I*c*d*x)**2,x)
```

```
[Out] Timed out
```

3.57 $\int \frac{a+b\tan^{-1}(cx)}{x^3(d+icdx)^2}\,dx$

Optimal. Leaf size=244

$$-\frac{ic^2\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}-\frac{3c^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{a+b\tan^{-1}(cx)}{2d^2x^2}+\frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x}-\frac{3ac^2\log(x)}{d^2}$$

```
[Out] -1/2*b*c/d^2/x-1/2*b*c^2/d^2/(I-c*x)+1/2*(-a-b*arctan(c*x))/d^2/x^2+2*I*c*(
a+b*arctan(c*x))/d^2/x-I*c^2*(a+b*arctan(c*x))/d^2/(I-c*x)-3*a*c^2*ln(x)/d^
2-2*I*b*c^2*ln(x)/d^2-3*c^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/d^2+I*b*c^2*l
n(c^2*x^2+1)/d^2-3/2*I*b*c^2*polylog(2,-I*c*x)/d^2+3/2*I*b*c^2*polylog(2,I*
c*x)/d^2-3/2*I*b*c^2*polylog(2,1-2/(1+I*c*x))/d^2
```

Rubi [A] time = 0.27, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 16, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.696, Rules used = {4876, 4852, 325, 203, 266, 36, 29, 31, 4848, 2391, 4862, 627, 44, 4854, 2402, 2315}

$$-\frac{3ibc^2\text{PolyLog}(2,-icx)}{2d^2}+\frac{3ibc^2\text{PolyLog}(2,icx)}{2d^2}-\frac{3ibc^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2d^2}-\frac{ic^2\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}-\frac{3c^2\log\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + I*c*d*x)^2),x]
```

```
[Out] -(b*c)/(2*d^2*x) - (b*c^2)/(2*d^2*(I - c*x)) - (a + b*ArcTan[c*x])/(2*d^2*x
^2) + ((2*I)*c*(a + b*ArcTan[c*x]))/(d^2*x) - (I*c^2*(a + b*ArcTan[c*x]))/(
d^2*(I - c*x)) - (3*a*c^2*Log[x])/d^2 - ((2*I)*b*c^2*Log[x])/d^2 - (3*c^2*(
a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/d^2 + (I*b*c^2*Log[1 + c^2*x^2])/d^2
 - (((3*I)/2)*b*c^2*PolyLog[2, (-I)*c*x])/d^2 + (((3*I)/2)*b*c^2*PolyLog[2,
 I*c*x])/d^2 - (((3*I)/2)*b*c^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/d^2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
```

```
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
```

```
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3(d+icdx)^2}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^2x^3} - \frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x^2} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{ic^3\left(a+b\tan^{-1}\right.}{d^2(-i+cx)^2}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d^2} - \frac{(2ic)\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d^2} - \frac{\left(3c^2\right)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^2} - \frac{\left(ic^3\right)\int \frac{a+b\tan^{-1}(cx}{(-i+cx)^2}}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{2d^2x^2} + \frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{ic^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{3ac^2\log(x)}{d^2} - \frac{3c^2}{}$$

$$= -\frac{bc}{2d^2x} - \frac{a+b\tan^{-1}(cx)}{2d^2x^2} + \frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{ic^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{3ac^2\log(x}{d^2}$$

$$= -\frac{bc}{2d^2x} - \frac{bc^2\tan^{-1}(cx)}{2d^2} - \frac{a+b\tan^{-1}(cx)}{2d^2x^2} + \frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{ic^2\left(a+b\tan^{-1}(c\right.}{d^2(i-cx)}$$

$$= -\frac{bc}{2d^2x} - \frac{bc^2}{2d^2(i-cx)} - \frac{bc^2\tan^{-1}(cx)}{2d^2} - \frac{a+b\tan^{-1}(cx)}{2d^2x^2} + \frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{ic^2\left(\right.}{}$$

$$= -\frac{bc}{2d^2x} - \frac{bc^2}{2d^2(i-cx)} - \frac{a+b\tan^{-1}(cx)}{2d^2x^2} + \frac{2ic\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{ic^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)}$$

Mathematica [C] time = 0.37, size = 222, normalized size = 0.91

$$-\frac{-\frac{2ic^2\left(a+b\tan^{-1}(cx)\right)}{cx-i} + 6c^2\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right) + \frac{a+b\tan^{-1}(cx)}{x^2} - \frac{4ic\left(a+b\tan^{-1}(cx)\right)}{x} + 6ac^2\log(x) + \frac{bc\,{}_2F_1\left(-\frac{1}{2},\right.}{x}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + I*c*d*x)^2),x]
```

```
[Out] -1/2*(-(b*c^2*((-I + c*x)^(-1) + ArcTan[c*x])) + (a + b*ArcTan[c*x])/x^2 -
((4*I)*c*(a + b*ArcTan[c*x]))/x - ((2*I)*c^2*(a + b*ArcTan[c*x]))/(-I + c*x
) + (b*c*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/x + 6*a*c^2*Log[x] +
6*c^2*(a + b*ArcTan[c*x])*Log[(2*I)/(I - c*x)] + (2*I)*b*c^2*(2*Log[x] - Lo
g[1 + c^2*x^2]) + (3*I)*b*c^2*PolyLog[2, (-I)*c*x] - (3*I)*b*c^2*PolyLog[2,
 I*c*x] + (3*I)*b*c^2*PolyLog[2, (I + c*x)/(-I + c*x)])/d^2
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,b\log\left(-\frac{cx+i}{cx-i}\right)-2\,a}{2\left(c^2d^2x^5-2i\,cd^2x^4-d^2x^3\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/2*(-I*b*log(-(c*x + I)/(c*x - I)) - 2*a)/(c^2*d^2*x^5 - 2*I*c*d^
2*x^4 - d^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.08, size = 380, normalized size = 1.56

$$-\frac{a}{2d^2x^2}-\frac{3ic^2b\,\mathrm{dilog}\left(-\frac{i(cx+i)}{2}\right)}{2d^2}-\frac{3c^2a\ln(cx)}{d^2}+\frac{ib\,c^2\ln\left(c^2x^2+1\right)}{d^2}+\frac{3c^2a\ln\left(c^2x^2+1\right)}{2d^2}-\frac{3ic^2b\ln(cx)\ln(icx+1)}{2d^2}-\frac{b\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^2,x)
```

```
[Out] -1/2*a/d^2/x^2+I*b*c^2*ln(c^2*x^2+1)/d^2-3*c^2*a/d^2*ln(c*x)-3/2*I*c^2*b/d^
2*ln(c*x)*ln(1+I*c*x)+3/2*c^2*a/d^2*ln(c^2*x^2+1)-2*I*c^2*b/d^2*ln(c*x)-1/2
*b/d^2*arctan(c*x)/x^2+2*I*c*a/d^2/x-3*c^2*b/d^2*ln(c*x)*arctan(c*x)+3/2*I*
c^2*b/d^2*ln(c*x)*ln(1-I*c*x)+3*c^2*b/d^2*arctan(c*x)*ln(c*x-I)+2*I*c*b/d^2
*arctan(c*x)/x+3/4*I*c^2*b/d^2*ln(c*x-I)^2-3/2*I*c^2*b/d^2*ln(c*x-I)*ln(-1/
2*I*(I+c*x))+3/2*I*c^2*b/d^2*dilog(1-I*c*x)+I*c^2*b/d^2*arctan(c*x)/(c*x-I)
-3/2*I*c^2*b/d^2*dilog(1+I*c*x)-3/2*I*c^2*b/d^2*dilog(-1/2*I*(I+c*x))-1/2*b
*c/d^2/x+3*I*c^2*a/d^2*arctan(c*x)+I*c^2*a/d^2/(c*x-I)+1/2*c^2*b/d^2/(c*x-I
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(-2i\,c\int\frac{\arctan(cx)}{c^4d^2x^6+2\,c^2d^2x^4+d^2x^2}\,dx-\int\frac{\left(c^2x^2-1\right)\arctan(cx)}{c^4d^2x^7+2\,c^2d^2x^5+d^2x^3}\,dx\right)b-\frac{1}{2}\,a\left(-\frac{2i\,c^2}{cd^2x-i\,d^2}-\frac{6\,c^2\log(cx-i)}{d^2}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] (-2*I*c*integrate(arctan(c*x)/(c^4*d^2*x^6 + 2*c^2*d^2*x^4 + d^2*x^2), x) -
 integrate((c^2*x^2 - 1)*arctan(c*x)/(c^4*d^2*x^7 + 2*c^2*d^2*x^5 + d^2*x^3
), x))*b - 1/2*a*(-2*I*c^2/(c*d^2*x - I*d^2) - 6*c^2*log(c*x - I)/d^2 + 6*c
^2*log(x)/d^2 - (4*I*c*x - 1)/(d^2*x^2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^3\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + c*d*x*1i)^2),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + c*d*x*1i)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a}{c^2x^5-2icx^4-x^3}\,dx+\int \frac{b\operatorname{atan}(cx)}{c^2x^5-2icx^4-x^3}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(d+I*c*d*x)**2,x)
```

```
[Out] -(Integral(a/(c**2*x**5 - 2*I*c*x**4 - x**3), x) + Integral(b*atan(c*x)/(c*
*2*x**5 - 2*I*c*x**4 - x**3), x))/d**2
```

3.58 $\int \frac{x^4\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx$

Optimal. Leaf size=256

$$\frac{4\left(a+b\tan^{-1}(cx)\right)}{c^5d^3(-cx+i)}-\frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^5d^3(-cx+i)^2}+\frac{6i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^5d^3}+\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3}-\frac{3ax}{c^4d^3}-\frac{3b\mathrm{Li}_2\left(1-\right.}{c^5d^3}$$

```
[Out] -3*a*x/c^4/d^3-1/2*I*b*x/c^4/d^3-1/8*b/c^5/d^3/(I-c*x)^2-15/8*I*b/c^5/d^3/(
I-c*x)+19/8*I*b*arctan(c*x)/c^5/d^3-3*b*x*arctan(c*x)/c^4/d^3+1/2*I*x^2*(a+
b*arctan(c*x))/c^3/d^3-1/2*I*(a+b*arctan(c*x))/c^5/d^3/(I-c*x)^2+4*(a+b*arc
tan(c*x))/c^5/d^3/(I-c*x)+6*I*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^5/d^3+3/2
*b*ln(c^2*x^2+1)/c^5/d^3-3*b*polylog(2,1-2/(1+I*c*x))/c^5/d^3
```

Rubi [A] time = 0.28, antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4876, 4846, 260, 4852, 321, 203, 4862, 627, 44, 4854, 2402, 2315}

$$-\frac{3b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^5d^3}+\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3}+\frac{4\left(a+b\tan^{-1}(cx)\right)}{c^5d^3(-cx+i)}-\frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^5d^3(-cx+i)^2}+\frac{6i\log\left(\frac{2}{1+icx}\right)\left(a+b\right.}{c^5d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] (-3*a*x)/(c^4*d^3) - ((I/2)*b*x)/(c^4*d^3) - b/(8*c^5*d^3*(I - c*x)^2) - ((
(15*I)/8)*b)/(c^5*d^3*(I - c*x)) + (((19*I)/8)*b*ArcTan[c*x])/(c^5*d^3) - (
3*b*x*ArcTan[c*x])/(c^4*d^3) + ((I/2)*x^2*(a + b*ArcTan[c*x]))/(c^3*d^3) -
((I/2)*(a + b*ArcTan[c*x]))/(c^5*d^3*(I - c*x)^2) + (4*(a + b*ArcTan[c*x]))
/(c^5*d^3*(I - c*x)) + ((6*I)*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^5*
d^3) + (3*b*Log[1 + c^2*x^2])/(2*c^5*d^3) - (3*b*PolyLog[2, 1 - 2/(1 + I*c*
x)])/(c^5*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x^4\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx = \int\left(-\frac{3\left(a+b\tan^{-1}(cx)\right)}{c^4d^3}+\frac{ix\left(a+b\tan^{-1}(cx)\right)}{c^3d^3}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^4d^3(-i+cx)^3}+\frac{4\left(a+b\tan\right.}{c^4d^3(-i+}\right.$$

$$=\frac{i\int\frac{a+b\tan^{-1}(cx)}{(-i+cx)^3}\,dx}{c^4d^3}-\frac{(6i)\int\frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{c^4d^3}-\frac{3\int\left(a+b\tan^{-1}(cx)\right)dx}{c^4d^3}+\frac{4\int\frac{a+b\tan^{-1}(c}{(-i+cx)^2}}{c^4d^3}$$

$$=-\frac{3ax}{c^4d^3}+\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3}-\frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^5d^3(i-cx)^2}+\frac{4\left(a+b\tan^{-1}(cx)\right)}{c^5d^3(i-cx)}+\frac{6i\left(a+\right.}{}$$

$$=-\frac{3ax}{c^4d^3}-\frac{ibx}{2c^4d^3}-\frac{3bx\tan^{-1}(cx)}{c^4d^3}+\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3}-\frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^5d^3(i-cx)^2}+\frac{4\left(a\right.}{c}$$

$$=-\frac{3ax}{c^4d^3}-\frac{ibx}{2c^4d^3}+\frac{ib\tan^{-1}(cx)}{2c^5d^3}-\frac{3bx\tan^{-1}(cx)}{c^4d^3}+\frac{ix^2\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3}-\frac{i\left(a+b\tan\right.}{2c^5d^3(i-}$$

$$=-\frac{3ax}{c^4d^3}-\frac{ibx}{2c^4d^3}-\frac{b}{8c^5d^3(i-cx)^2}-\frac{15ib}{8c^5d^3(i-cx)}+\frac{ib\tan^{-1}(cx)}{2c^5d^3}-\frac{3bx\tan^{-1}(cx)}{c^4d^3}+\frac{i}{}$$

$$=-\frac{3ax}{c^4d^3}-\frac{ibx}{2c^4d^3}-\frac{b}{8c^5d^3(i-cx)^2}-\frac{15ib}{8c^5d^3(i-cx)}+\frac{19ib\tan^{-1}(cx)}{8c^5d^3}-\frac{3bx\tan^{-1}(cx)}{c^4d^3}+$$

Mathematica [A] time = 1.06, size = 235, normalized size = 0.92

$$\frac{16iac^2x^2-96ia\log\left(c^2x^2+1\right)-96acx-\frac{128a}{cx-i}-\frac{16ia}{(cx-i)^2}+192a\tan^{-1}(cx)+b\left(48\log\left(c^2x^2+1\right)+4i\tan^{-1}(cx)\left(4c^2\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] (-96*a*c*x + (16*I)*a*c^2*x^2 - ((16*I)*a)/(-I + c*x)^2 - (128*a)/(-I + c*x
) + 192*a*ArcTan[c*x] - (96*I)*a*Log[1 + c^2*x^2] + b*((-16*I)*c*x + 192*Ar
cTan[c*x]^2 - 28*Cos[2*ArcTan[c*x]] + Cos[4*ArcTan[c*x]] + 48*Log[1 + c^2*x
^2] + 96*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + (28*I)*Sin[2*ArcTan[c*x]] + (
4*I)*ArcTan[c*x]*(4 + (24*I)*c*x + 4*c^2*x^2 - 14*Cos[2*ArcTan[c*x]] + Cos[
4*ArcTan[c*x]] + 48*Log[1 + E^((2*I)*ArcTan[c*x])] + (14*I)*Sin[2*ArcTan[c*
x]] - I*Sin[4*ArcTan[c*x]]) - I*Sin[4*ArcTan[c*x]]))/(32*c^5*d^3)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(-\frac{bx^4\log\left(-\frac{cx+i}{cx-i}\right)-2i\,ax^4}{2\,c^3d^3x^3-6i\,c^2d^3x^2-6\,cd^3x+2i\,d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^4*log(-(c*x + I)/(c*x - I)) - 2*I*a*x^4)/(2*c^3*d^3*x^3 - 6*
I*c^2*d^3*x^2 - 6*c*d^3*x + 2*I*d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.07, size = 423, normalized size = 1.65

$$-\frac{3ax}{c^4d^3}-\frac{3ia\ln\left(c^2x^2+1\right)}{c^5d^3}-\frac{4a}{c^5d^3\left(cx-i\right)}-\frac{ib\arctan\left(cx\right)}{2c^5d^3\left(cx-i\right)^2}+\frac{6a\arctan\left(cx\right)}{c^5d^3}+\frac{ia\,x^2}{2c^3d^3}-\frac{3bx\arctan\left(cx\right)}{c^4d^3}+\frac{5ib\arctan\left(\right.}{32c^5d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x)
```

```
[Out] -3*a*x/c^4/d^3-3*I/c^5*a/d^3*ln(c^2*x^2+1)-4/c^5*a/d^3/(c*x-I)-1/2*I/c^5*b/
d^3*arctan(c*x)/(c*x-I)^2+6/c^5*a/d^3*arctan(c*x)+1/2*I/c^3*a/d^3*x^2-3*b*x
*arctan(c*x)/c^4/d^3+5/32*I/c^5*b/d^3*arctan(1/2*c*x)-4/c^5*b/d^3*arctan(c*
x)/(c*x-I)+15/8*I/c^5*b/d^3/(c*x-I)-5/32*I/c^5*b/d^3*arctan(1/6*c^3*x^3+7/6
*c*x)-1/2/c^5*b/d^3-5/16*I/c^5*b/d^3*arctan(1/2*c*x-1/2*I)+5/64/c^5*b/d^3*l
n(c^4*x^4+10*c^2*x^2+9)-1/2*I*b*x/c^4/d^3-1/2*I/c^5*a/d^3/(c*x-I)^2+1/2*I/c
^3*b/d^3*arctan(c*x)*x^2-6*I/c^5*b/d^3*arctan(c*x)*ln(c*x-I)-1/8/c^5*b/d^3/
(c*x-I)^2+43/32*b*ln(c^2*x^2+1)/c^5/d^3+43/16*I/c^5*b/d^3*arctan(c*x)+3/2/c
^5*b/d^3*ln(c*x-I)^2-3/c^5*b/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))-3/c^5*b/d^3*d
ilog(-1/2*I*(I+c*x))
```

maxima [A] time = 0.45, size = 356, normalized size = 1.39

$$\frac{8i\,ac^4x^4-8\left(4\,a+i\,b\right)c^3x^3+\left(b(5i\ \arctan\left(1,cx\right)-16\right)+88i\,a)c^2x^2+\left(b(10\ \arctan\left(1,cx\right)+38i\right)-16\,a)cx+\left(2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] (8*I*a*c^4*x^4 - 8*(4*a + I*b)*c^3*x^3 + (b*(5*I*arctan2(1, c*x) - 16) + 88
*I*a)*c^2*x^2 + (b*(10*arctan2(1, c*x) + 38*I) - 16*a)*c*x + (24*b*c^2*x^2
- 48*I*b*c*x - 24*b)*arctan(c*x)^2 + (6*b*c^2*x^2 - 12*I*b*c*x - 6*b)*log(c
^2*x^2 + 1)^2 + (-24*I*b*c^2*x^2 - 48*b*c*x + 24*I*b)*arctan(c*x)*log(1/4*c
^2*x^2 + 1/4) + b*(-5*I*arctan2(1, c*x) + 28) + (8*I*b*c^4*x^4 - 32*b*c^3*x
^3 + (96*a + 131*I*b)*c^2*x^2 + (-192*I*a + 70*b)*c*x - 96*a + 13*I*b)*arct
an(c*x) - (48*b*c^2*x^2 - 96*I*b*c*x - 48*b)*dilog(1/2*I*c*x + 1/2) + ((-48
*I*a + 24*b)*c^2*x^2 - 48*(2*a + I*b)*c*x - (12*b*c^2*x^2 - 24*I*b*c*x - 12
*b)*log(1/4*c^2*x^2 + 1/4) + 48*I*a - 24*b)*log(c^2*x^2 + 1) + 56*I*a)/(16*
c^7*d^3*x^2 - 32*I*c^6*d^3*x - 16*c^5*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*atan(c*x)))/(d + c*d*x*1i)^3,x)
```

```
[Out] int((x^4*(a + b*atan(c*x)))/(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*atan(c*x))/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.59 $\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx$

Optimal. Leaf size=225

$$-\frac{3i\left(a+b\tan^{-1}(cx)\right)}{c^4d^3(-cx+i)}-\frac{a+b\tan^{-1}(cx)}{2c^4d^3(-cx+i)^2}+\frac{3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^3}+\frac{iax}{c^3d^3}+\frac{3ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2c^4d^3}-\frac{11b}{8c^4d^3(-cx+i)}$$

```
[Out] I*a*x/c^3/d^3+1/8*I*b/c^4/d^3/(I-c*x)^2-11/8*b/c^4/d^3/(I-c*x)+11/8*b*arcta
n(c*x)/c^4/d^3+I*b*x*arctan(c*x)/c^3/d^3+1/2*(-a-b*arctan(c*x))/c^4/d^3/(I-
c*x)^2-3*I*(a+b*arctan(c*x))/c^4/d^3/(I-c*x)+3*(a+b*arctan(c*x))*ln(2/(1+I*
c*x))/c^4/d^3-1/2*I*b*ln(c^2*x^2+1)/c^4/d^3+3/2*I*b*polylog(2,1-2/(1+I*c*x)
)/c^4/d^3
```

Rubi [A] time = 0.24, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4846, 260, 4862, 627, 44, 203, 4854, 2402, 2315}

$$\frac{3ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c^4d^3}-\frac{3i\left(a+b\tan^{-1}(cx)\right)}{c^4d^3(-cx+i)}-\frac{a+b\tan^{-1}(cx)}{2c^4d^3(-cx+i)^2}+\frac{3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^3}+\frac{iax}{c^3d^3}-\frac{ib\log(\ldots}{2c\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] (I*a*x)/(c^3*d^3) + ((I/8)*b)/(c^4*d^3*(I - c*x)^2) - (11*b)/(8*c^4*d^3*(I
- c*x)) + (11*b*ArcTan[c*x])/(8*c^4*d^3) + (I*b*x*ArcTan[c*x])/(c^3*d^3) -
(a + b*ArcTan[c*x])/(2*c^4*d^3*(I - c*x)^2) - ((3*I)*(a + b*ArcTan[c*x]))/(
c^4*d^3*(I - c*x)) + (3*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^4*d^3) -
 ((I/2)*b*Log[1 + c^2*x^2])/(c^4*d^3) + (((3*I)/2)*b*PolyLog[2, 1 - 2/(1 +
I*c*x)])/(c^4*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx = \int\left(\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^3d^3}+\frac{a+b\tan^{-1}(cx)}{c^3d^3(-i+cx)^3}-\frac{3i\left(a+b\tan^{-1}(cx)\right)}{c^3d^3(-i+cx)^2}-\frac{3\left(a+b\tan^{-1}(cx\right.}{c^3d^3(-i+cx)}\right.$$

$$=\frac{i\int\left(a+b\tan^{-1}(cx)\right)dx}{c^3d^3}-\frac{(3i)\int\frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}dx}{c^3d^3}+\frac{\int\frac{a+b\tan^{-1}(cx)}{(-i+cx)^3}dx}{c^3d^3}-\frac{3\int\frac{a+b\tan^{-1}(cx)}{-i+cx}}{c^3d^3}$$

$$=\frac{iax}{c^3d^3}-\frac{a+b\tan^{-1}(cx)}{2c^4d^3(i-cx)^2}-\frac{3i\left(a+b\tan^{-1}(cx)\right)}{c^4d^3(i-cx)}+\frac{3\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^4d^3}+\frac{(i}{}$$

$$=\frac{iax}{c^3d^3}+\frac{ibx\tan^{-1}(cx)}{c^3d^3}-\frac{a+b\tan^{-1}(cx)}{2c^4d^3(i-cx)^2}-\frac{3i\left(a+b\tan^{-1}(cx)\right)}{c^4d^3(i-cx)}+\frac{3\left(a+b\tan^{-1}(cx)\right)}{c^4d^3}$$

$$=\frac{iax}{c^3d^3}+\frac{ibx\tan^{-1}(cx)}{c^3d^3}-\frac{a+b\tan^{-1}(cx)}{2c^4d^3(i-cx)^2}-\frac{3i\left(a+b\tan^{-1}(cx)\right)}{c^4d^3(i-cx)}+\frac{3\left(a+b\tan^{-1}(cx)\right)}{c^4d^3}$$

$$=\frac{iax}{c^3d^3}+\frac{ib}{8c^4d^3(i-cx)^2}-\frac{11b}{8c^4d^3(i-cx)}+\frac{ibx\tan^{-1}(cx)}{c^3d^3}-\frac{a+b\tan^{-1}(cx)}{2c^4d^3(i-cx)^2}-\frac{3i\left(a+b\right.}{c^4d^3(}$$

$$=\frac{iax}{c^3d^3}+\frac{ib}{8c^4d^3(i-cx)^2}-\frac{11b}{8c^4d^3(i-cx)}+\frac{11b\tan^{-1}(cx)}{8c^4d^3}+\frac{ibx\tan^{-1}(cx)}{c^3d^3}-\frac{a+b\tan^{-}}{2c^4d^3(i-}$$

Mathematica [A] time = 0.86, size = 216, normalized size = 0.96

$$\frac{-48a\log\left(c^2x^2+1\right)+32iacx+\frac{96ia}{cx-i}-\frac{16a}{(cx-i)^2}-96ia\tan^{-1}(cx)+ib\left(-16\log\left(c^2x^2+1\right)-48\text{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right)-96\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] ((32*I)*a*c*x - (16*a)/(-I + c*x)^2 + ((96*I)*a)/(-I + c*x) - (96*I)*a*ArcT
an[c*x] - 48*a*Log[1 + c^2*x^2] + I*b*(-96*ArcTan[c*x]^2 + 20*Cos[2*ArcTan[
c*x]] - Cos[4*ArcTan[c*x]] - 16*Log[1 + c^2*x^2] - 48*PolyLog[2, -E^((2*I)*
ArcTan[c*x])] - (20*I)*Sin[2*ArcTan[c*x]] + 4*ArcTan[c*x]*(8*c*x + (10*I)*C
os[2*ArcTan[c*x]] - I*Cos[4*ArcTan[c*x]] - (24*I)*Log[1 + E^((2*I)*ArcTan[c
*x])] + 10*Sin[2*ArcTan[c*x]] - Sin[4*ArcTan[c*x]]) + I*Sin[4*ArcTan[c*x]])
)/(32*c^4*d^3)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{bx^3\log\left(-\frac{cx+i}{cx-i}\right)-2i\,ax^3}{2\,c^3d^3x^3-6i\,c^2d^3x^2-6\,cd^3x+2i\,d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^3*log(-(c*x + I)/(c*x - I)) - 2*I*a*x^3)/(2*c^3*d^3*x^3 - 6*
I*c^2*d^3*x^2 - 6*c*d^3*x + 2*I*d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.07, size = 375, normalized size = 1.67

$$-\frac{3ia\arctan(cx)}{c^4d^3}+\frac{3ib\arctan(cx)}{c^4d^3(cx-i)}-\frac{3a\ln\left(c^2x^2+1\right)}{2c^4d^3}+\frac{ibx\arctan(cx)}{c^3d^3}-\frac{a}{2c^4d^3(cx-i)^2}+\frac{3ib\ln(cx-i)\ln\left(-\frac{i(cx+i}{2}\right.}{2c^4d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x)
```

```
[Out] -3*I/c^4*a/d^3*arctan(c*x)+3*I/c^4*b/d^3*arctan(c*x)/(c*x-I)-3/2/c^4*a/d^3*
ln(c^2*x^2+1)+I*b*x*arctan(c*x)/c^3/d^3-1/2/c^4*a/d^3/(c*x-I)^2+3/2*I/c^4*b
/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))+I*a*x/c^3/d^3-3/c^4*b/d^3*arctan(c*x)*ln(
c*x-I)-1/2/c^4*b/d^3*arctan(c*x)/(c*x-I)^2+3/64*I/c^4*b/d^3*ln(c^4*x^4+10*c
^2*x^2+9)+3/32/c^4*b/d^3*arctan(1/6*c^3*x^3+7/6*c*x)-3/32/c^4*b/d^3*arctan(
1/2*c*x)+3/16/c^4*b/d^3*arctan(1/2*c*x-1/2*I)-19/32*I/c^4*b/d^3*ln(c^2*x^2+
1)-3/4*I/c^4*b/d^3*ln(c*x-I)^2+19/16*b*arctan(c*x)/c^4/d^3+11/8/c^4*b/d^3/(
c*x-I)+3*I/c^4*a/d^3/(c*x-I)+1/8*I/c^4*b/d^3/(c*x-I)^2+3/2*I/c^4*b/d^3*dilo
g(-1/2*I*(I+c*x))
```

maxima [A] time = 0.43, size = 327, normalized size = 1.45

$$-\frac{-16i\,ac^3x^3-32\,ac^2x^2+(-32i\,a-22\,b)cx+\left(12i\,bc^2x^2+24\,bcx-12i\,b\right)\arctan(cx)^2+\left(3i\,bc^2x^2+6\,bcx-3i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -(-16*I*a*c^3*x^3 - 32*a*c^2*x^2 + (-32*I*a - 22*b)*c*x + (12*I*b*c^2*x^2 +
 24*b*c*x - 12*I*b)*arctan(c*x)^2 + (3*I*b*c^2*x^2 + 6*b*c*x - 3*I*b)*log(c
^2*x^2 + 1)^2 + (12*b*c^2*x^2 - 24*I*b*c*x - 12*b)*arctan(c*x)*log(1/4*c^2*
x^2 + 1/4) + (-16*I*b*c^3*x^3 + (48*I*a - 51*b)*c^2*x^2 + 6*(16*a + I*b)*c*
x - 48*I*a - 21*b)*arctan(c*x) + (3*b*c^2*x^2 - 6*I*b*c*x - 3*b)*arctan2(c*
x, -1) + (-24*I*b*c^2*x^2 - 48*b*c*x + 24*I*b)*dilog(1/2*I*c*x + 1/2) + (8*
(3*a + I*b)*c^2*x^2 + (-48*I*a + 16*b)*c*x + (-6*I*b*c^2*x^2 - 12*b*c*x + 6
*I*b)*log(1/4*c^2*x^2 + 1/4) - 24*a - 8*I*b)*log(c^2*x^2 + 1) - 40*a + 20*I
*b)/(16*c^6*d^3*x^2 - 32*I*c^5*d^3*x - 16*c^4*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + c*d*x*1i)^3,x)
```

```
[Out] int((x^3*(a + b*atan(c*x)))/(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.60 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx$

Optimal. Leaf size=176

$$-\frac{2\left(a+b\tan^{-1}(cx)\right)}{c^3d^3(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(-cx+i)^2}-\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^3}+\frac{b\text{Li}_2\left(1-\frac{2}{icx+1}\right)}{2c^3d^3}+\frac{7ib}{8c^3d^3(-cx+i)}+\frac{}{8c^3d}$$

```
[Out] 1/8*b/c^3/d^3/(I-c*x)^2+7/8*I*b/c^3/d^3/(I-c*x)-7/8*I*b*arctan(c*x)/c^3/d^3
+1/2*I*(a+b*arctan(c*x))/c^3/d^3/(I-c*x)^2-2*(a+b*arctan(c*x))/c^3/d^3/(I-c
*x)-I*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3/d^3+1/2*b*polylog(2,1-2/(1+I*c*
x))/c^3/d^3
```

Rubi [A] time = 0.22, antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4876, 4862, 627, 44, 203, 4854, 2402, 2315}

$$\frac{b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c^3d^3}-\frac{2\left(a+b\tan^{-1}(cx)\right)}{c^3d^3(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(-cx+i)^2}-\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^3}+\frac{7ib}{8c^3d^3(-cx+i)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] b/(8*c^3*d^3*(I - c*x)^2) + (((7*I)/8)*b)/(c^3*d^3*(I - c*x)) - (((7*I)/8)*
b*ArcTan[c*x])/(c^3*d^3) + ((I/2)*(a + b*ArcTan[c*x]))/(c^3*d^3*(I - c*x)^2
) - (2*(a + b*ArcTan[c*x]))/(c^3*d^3*(I - c*x)) - (I*(a + b*ArcTan[c*x])*Lo
g[2/(1 + I*c*x)])/(c^3*d^3) + (b*PolyLog[2, 1 - 2/(1 + I*c*x)])/(2*c^3*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
```

```
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx = \int \left(-\frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^3(-i+cx)^3} - \frac{2\left(a+b\tan^{-1}(cx)\right)}{c^2d^3(-i+cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{c^2d^3(-i+cx)}\right) dx$$

$$= -\frac{i\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^3}\,dx}{c^2d^3} + \frac{i\int \frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{c^2d^3} - \frac{2\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{c^2d^3}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(i-cx)^2} - \frac{2\left(a+b\tan^{-1}(cx)\right)}{c^3d^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^3d^3} - \frac{(ib)\,\int}{}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(i-cx)^2} - \frac{2\left(a+b\tan^{-1}(cx)\right)}{c^3d^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^3d^3} + \frac{b\,\mathrm{Su}}{}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(i-cx)^2} - \frac{2\left(a+b\tan^{-1}(cx)\right)}{c^3d^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^3d^3} + \frac{b\mathrm{Li}_2}{}$$

$$= \frac{b}{8c^3d^3(i-cx)^2} + \frac{7ib}{8c^3d^3(i-cx)} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(i-cx)^2} - \frac{2\left(a+b\tan^{-1}(cx)\right)}{c^3d^3(i-cx)} - \frac{i\left(a\right.}{}$$

$$= \frac{b}{8c^3d^3(i-cx)^2} + \frac{7ib}{8c^3d^3(i-cx)} - \frac{7ib\tan^{-1}(cx)}{8c^3d^3} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(i-cx)^2} - \frac{2\left(a+b\,\mathrm{ta}\right.}{c^3d^3(i}$$

Mathematica [A] time = 0.17, size = 187, normalized size = 1.06

$$-\frac{i\left(8ac^2x^2\log\left(\frac{2i}{-cx+i}\right) + 16iacx - 16iacx\log\left(\frac{2i}{-cx+i}\right) - 8a\log\left(\frac{2i}{-cx+i}\right) + 12a + b\left(7c^2x^2 + 2icx + 8(cx-i)^2\log\left(\right.\right.\right.}{8c^3d^3(cx-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] ((-1/8*I)*(12*a - (6*I)*b + (16*I)*a*c*x + 7*b*c*x - 8*a*Log[(2*I)/(I - c*x
)] - (16*I)*a*c*x*Log[(2*I)/(I - c*x)] + 8*a*c^2*x^2*Log[(2*I)/(I - c*x)] +
 b*ArcTan[c*x]*(5 + (2*I)*c*x + 7*c^2*x^2 + 8*(-I + c*x)^2*Log[(2*I)/(I - c
*x)]) + (4*I)*b*(-I + c*x)^2*PolyLog[2, (I + c*x)/(-I + c*x)]))/(c^3*d^3*(-
I + c*x)^2)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{bx^2\log\left(-\frac{cx+i}{cx-i}\right)-2i\,ax^2}{2\,c^3d^3x^3-6i\,c^2d^3x^2-6\,cd^3x+2i\,d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*x^2*log(-(c*x + I)/(c*x - I)) - 2*I*a*x^2)/(2*c^3*d^3*x^3 - 6*
I*c^2*d^3*x^2 - 6*c*d^3*x + 2*I*d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.07, size = 349, normalized size = 1.98

$$\frac{2a}{c^3d^3\,(cx-i)}+\frac{ia\ln\left(c^2x^2+1\right)}{2c^3d^3}-\frac{a\arctan\,(cx)}{c^3d^3}-\frac{7ib\arctan\left(\frac{1}{6}c^3x^3+\frac{7}{6}cx\right)}{32c^3d^3}+\frac{2b\arctan\,(cx)}{c^3d^3\,(cx-i)}-\frac{7ib\arctan\left(\frac{cx}{2}-\frac{i}{2}\right)}{16c^3d^3}-7i$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x)
```

```
[Out] 2/c^3*a/d^3/(c*x-I)+1/2*I/c^3*a/d^3*ln(c^2*x^2+1)-1/c^3*a/d^3*arctan(c*x)-7
/32*I/c^3*b/d^3*arctan(1/6*c^3*x^3+7/6*c*x)+2/c^3*b/d^3*arctan(c*x)/(c*x-I)
-7/16*I/c^3*b/d^3*arctan(1/2*c*x-1/2*I)-7/16*I/c^3*b/d^3*arctan(c*x)+7/64/c
^3*b/d^3*ln(c^4*x^4+10*c^2*x^2+9)-7/8*I/c^3*b/d^3/(c*x-I)+I/c^3*b/d^3*arcta
n(c*x)*ln(c*x-I)+1/2*I/c^3*b/d^3*arctan(c*x)/(c*x-I)^2+1/2*I/c^3*a/d^3/(c*x
-I)^2+1/8/c^3*b/d^3/(c*x-I)^2-7/32/c^3*b/d^3*ln(c^2*x^2+1)+7/32*I/c^3*b/d^3
*arctan(1/2*c*x)+1/2/c^3*b/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/2/c^3*b/d^3*d
ilog(-1/2*I*(I+c*x))-1/4/c^3*b/d^3*ln(c*x-I)^2
```

maxima [A] time = 0.39, size = 293, normalized size = 1.66

$$-\frac{-7i\,bc^2x^2\arctan\,(1,cx)-(b(14\,\arctan\,(1,cx)-14i)+32\,a)cx+\left(4\,bc^2x^2-8i\,bcx-4\,b\right)\arctan\,(cx)^2+\left(bc^2x^2-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -(-7*I*b*c^2*x^2*arctan2(1, c*x) - (b*(14*arctan2(1, c*x) - 14*I) + 32*a)*c
*x + (4*b*c^2*x^2 - 8*I*b*c*x - 4*b)*arctan(c*x)^2 + (b*c^2*x^2 - 2*I*b*c*x
 - b)*log(c^2*x^2 + 1)^2 + (-4*I*b*c^2*x^2 - 8*b*c*x + 4*I*b)*arctan(c*x)*l
og(1/4*c^2*x^2 + 1/4) + b*(7*I*arctan2(1, c*x) + 12) + ((16*a + 7*I*b)*c^2*
x^2 + (-32*I*a - 18*b)*c*x - 16*a + 17*I*b)*arctan(c*x) - (8*b*c^2*x^2 - 16
```

```
*I*b*c*x - 8*b)*dilog(1/2*I*c*x + 1/2) + (-8*I*a*c^2*x^2 - 16*a*c*x - (2*b*
c^2*x^2 - 4*I*b*c*x - 2*b)*log(1/4*c^2*x^2 + 1/4) + 8*I*a)*log(c^2*x^2 + 1)
 + 24*I*a)/(16*c^5*d^3*x^2 - 32*I*c^4*d^3*x - 16*c^3*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + c*d*x*1i)^3,x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.61 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx$

Optimal. Leaf size=88

$$\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(1+icx)^2}+\frac{3b}{8c^2d^3(-cx+i)}-\frac{ib}{8c^2d^3(-cx+i)^2}+\frac{b\tan^{-1}(cx)}{8c^2d^3}$$

```
[Out] -1/8*I*b/c^2/d^3/(I-c*x)^2+3/8*b/c^2/d^3/(I-c*x)+1/8*b*arctan(c*x)/c^2/d^3+
1/2*x^2*(a+b*arctan(c*x))/d^3/(1+I*c*x)^2
```

Rubi [A] time = 0.08, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {37, 4872, 12, 88, 203}

$$\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(1+icx)^2}+\frac{3b}{8c^2d^3(-cx+i)}-\frac{ib}{8c^2d^3(-cx+i)^2}+\frac{b\tan^{-1}(cx)}{8c^2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] ((-I/8)*b)/(c^2*d^3*(I - c*x)^2) + (3*b)/(8*c^2*d^3*(I - c*x)) + (b*ArcTan[
c*x])/(8*c^2*d^3) + (x^2*(a + b*ArcTan[c*x]))/(2*d^3*(1 + I*c*x)^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 88

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x
_))^(p_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n*(e + f*
x)^p, x], x] /; FreeQ[{a, b, c, d, e, f, p}, x] && IntegersQ[m, n] && (Inte
gerQ[p] || (GtQ[m, 0] && GeQ[n, -1]))
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 4872

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_))^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dist[a
+ b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2), x
], x], x]] /; FreeQ[{a, b, c, d, e, f, q}, x] && NeQ[q, -1] && IntegerQ[2*m
] && ((IGtQ[m, 0] && IGtQ[q, 0]) || (ILtQ[m + q + 1, 0] && LtQ[m*q, 0]))
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{(d+icdx)^3}\,dx = \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(1+icx)^2} - (bc)\int \frac{x^2}{2d^3(i-cx)^3(i+cx)}\,dx$$
$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(1+icx)^2} - \frac{(bc)\int \frac{x^2}{(i-cx)^3(i+cx)}\,dx}{2d^3}$$
$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(1+icx)^2} - \frac{(bc)\int \left(-\frac{i}{2c^2(-i+cx)^3} - \frac{3}{4c^2(-i+cx)^2} - \frac{1}{4c^2\left(1+c^2x^2\right)}\right)dx}{2d^3}$$
$$= -\frac{ib}{8c^2d^3(i-cx)^2} + \frac{3b}{8c^2d^3(i-cx)} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(1+icx)^2} + \frac{b\int \frac{1}{1+c^2x^2}\,dx}{8cd^3}$$
$$= -\frac{ib}{8c^2d^3(i-cx)^2} + \frac{3b}{8c^2d^3(i-cx)} + \frac{b\tan^{-1}(cx)}{8c^2d^3} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(1+icx)^2}$$

Mathematica [A] time = 0.09, size = 63, normalized size = 0.72

$$\frac{a(-4-8icx) - b\left(3c^2x^2+2icx+1\right)\tan^{-1}(cx) + b(-3cx+2i)}{8c^2d^3(cx-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + I*c*d*x)^3,x]
```

```
[Out] (b*(2*I - 3*c*x) + a*(-4 - (8*I)*c*x) - b*(1 + (2*I)*c*x + 3*c^2*x^2)*ArcTa
n[c*x])/(8*c^2*d^3*(-I + c*x)^2)
```

fricas [A] time = 0.61, size = 83, normalized size = 0.94

$$\frac{(-16i\,a-6\,b)cx + \left(-3i\,bc^2x^2+2\,bcx-i\,b\right)\log\left(-\frac{cx+i}{cx-i}\right) - 8\,a + 4i\,b}{16\left(c^4d^3x^2 - 2i\,c^3d^3x - c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] 1/16*((-16*I*a - 6*b)*c*x + (-3*I*b*c^2*x^2 + 2*b*c*x - I*b)*log(-(c*x + I)
/(c*x - I)) - 8*a + 4*I*b)/(c^4*d^3*x^2 - 2*I*c^3*d^3*x - c^2*d^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 128, normalized size = 1.45

$$-\frac{ia}{c^2d^3(cx-i)} + \frac{a}{2c^2d^3(cx-i)^2} - \frac{ib\arctan(cx)}{c^2d^3(cx-i)} + \frac{b\arctan(cx)}{2c^2d^3(cx-i)^2} - \frac{3b\arctan(cx)}{8c^2d^3} - \frac{ib}{8c^2d^3(cx-i)^2} - \frac{3b}{8c^2d^3(cx-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x)
```

```
[Out] -I/c^2*a/d^3/(c*x-I)+1/2/c^2*a/d^3/(c*x-I)^2-I/c^2*b/d^3*arctan(c*x)/(c*x-I
)+1/2/c^2*b/d^3*arctan(c*x)/(c*x-I)^2-3/8*b*arctan(c*x)/c^2/d^3-1/8*I/c^2*b
/d^3/(c*x-I)^2-3/8/c^2*b/d^3/(c*x-I)
```

maxima [A] time = 0.34, size = 71, normalized size = 0.81

$$-\frac{(8i\,a+3\,b)cx+\left(3\,bc^2x^2+2i\,bcx+b\right)\arctan\left(cx\right)+4\,a-2i\,b}{8\,c^4d^3x^2-16i\,c^3d^3x-8\,c^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -((8*I*a + 3*b)*c*x + (3*b*c^2*x^2 + 2*I*b*c*x + b)*arctan(c*x) + 4*a - 2*I
*b)/(8*c^4*d^3*x^2 - 16*I*c^3*d^3*x - 8*c^2*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + c*d*x*1i)^3,x)
```

```
[Out] int((x*(a + b*atan(c*x)))/(d + c*d*x*1i)^3, x)
```

sympy [B] time = 10.22, size = 194, normalized size = 2.20

$$\frac{b\left(\frac{3i\log\left(x-\frac{i}{c}\right)}{16}-\frac{3i\log\left(x+\frac{i}{c}\right)}{16}\right)}{c^2d^3}+\frac{(-2ibcx-b)\log\left(icx+1\right)}{4ic^4d^3x^2+8c^3d^3x-4ic^2d^3}+\frac{(-2ibcx-b)\log\left(-icx+1\right)}{-4ic^4d^3x^2-8c^3d^3x+4ic^2d^3}+\frac{4a-2ib+x\left(8iac+3b\right.}{-8c^4d^3x^2+16ic^3d^3x+8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(d+I*c*d*x)**3,x)
```

```
[Out] b*(3*I*log(x - I/c)/16 - 3*I*log(x + I/c)/16)/(c**2*d**3) + (-2*I*b*c*x - b
)*log(I*c*x + 1)/(4*I*c**4*d**3*x**2 + 8*c**3*d**3*x - 4*I*c**2*d**3) + (-2
*I*b*c*x - b)*log(-I*c*x + 1)/(-4*I*c**4*d**3*x**2 - 8*c**3*d**3*x + 4*I*c*
*2*d**3) + (4*a - 2*I*b + x*(8*I*a*c + 3*b*c))/(-8*c**4*d**3*x**2 + 16*I*c*
*3*d**3*x + 8*c**2*d**3)
```

3.62 $\int \frac{a+b\tan^{-1}(cx)}{(d+icdx)^3}\,dx$

Optimal. Leaf size=92

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{2cd^3(1+icx)^2}+\frac{ib}{8cd^3(-cx+i)}-\frac{b}{8cd^3(-cx+i)^2}-\frac{ib\tan^{-1}(cx)}{8cd^3}$$

```
[Out] -1/8*b/c/d^3/(I-c*x)^2+1/8*I*b/c/d^3/(I-c*x)-1/8*I*b*arctan(c*x)/c/d^3+1/2*
I*(a+b*arctan(c*x))/c/d^3/(1+I*c*x)^2
```

Rubi [A] time = 0.05, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4862, 627, 44, 203}

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{2cd^3(1+icx)^2}+\frac{ib}{8cd^3(-cx+i)}-\frac{b}{8cd^3(-cx+i)^2}-\frac{ib\tan^{-1}(cx)}{8cd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + I*c*d*x)^3,x]
```

```
[Out] -b/(8*c*d^3*(I - c*x)^2) + ((I/8)*b)/(c*d^3*(I - c*x)) - ((I/8)*b*ArcTan[c*
x])/(c*d^3) + ((I/2)*(a + b*ArcTan[c*x]))/(c*d^3*(1 + I*c*x)^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{(d+icdx)^3}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)}{2cd^3(1+icx)^2} - \frac{(ib)\int \frac{1}{(d+icdx)^2\left(1+c^2x^2\right)}\,dx}{2d}$$
$$= \frac{i\left(a+b\tan^{-1}(cx)\right)}{2cd^3(1+icx)^2} - \frac{(ib)\int \frac{1}{\left(\frac{1}{d}-\frac{icx}{d}\right)(d+icdx)^3}\,dx}{2d}$$
$$= \frac{i\left(a+b\tan^{-1}(cx)\right)}{2cd^3(1+icx)^2} - \frac{(ib)\int \left(\frac{i}{2d^2(-i+cx)^3} - \frac{1}{4d^2(-i+cx)^2} + \frac{1}{4d^2\left(1+c^2x^2\right)}\right)dx}{2d}$$
$$= -\frac{b}{8cd^3(i-cx)^2} + \frac{ib}{8cd^3(i-cx)} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{2cd^3(1+icx)^2} - \frac{(ib)\int \frac{1}{1+c^2x^2}\,dx}{8d^3}$$
$$= -\frac{b}{8cd^3(i-cx)^2} + \frac{ib}{8cd^3(i-cx)} - \frac{ib\tan^{-1}(cx)}{8cd^3} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{2cd^3(1+icx)^2}$$

Mathematica [A] time = 0.04, size = 55, normalized size = 0.60

$$-\frac{i\left(4a+b\left(c^2x^2-2icx+3\right)\tan^{-1}(cx)+b(cx-2i)\right)}{8cd^3(cx-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + I*c*d*x)^3,x]
```

```
[Out] ((-1/8*I)*(4*a + b*(-2*I + c*x) + b*(3 - (2*I)*c*x + c^2*x^2)*ArcTan[c*x]))
/(c*d^3*(-I + c*x)^2)
```

fricas [A] time = 0.47, size = 75, normalized size = 0.82

$$\frac{-2i\,bcx+\left(bc^2x^2-2i\,bcx+3\,b\right)\log\left(-\frac{cx+i}{cx-i}\right)-8i\,a-4\,b}{16\left(c^3d^3x^2-2i\,c^2d^3x-cd^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(-2*I*b*c*x + (b*c^2*x^2 - 2*I*b*c*x + 3*b)*log(-(c*x + I)/(c*x - I))
- 8*I*a - 4*b)/(c^3*d^3*x^2 - 2*I*c^2*d^3*x - c*d^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 93, normalized size = 1.01

$$\frac{ia}{2c\,d^3\,(icx+1)^2} + \frac{ib\arctan(cx)}{2c\,d^3\,(icx+1)^2} - \frac{ib\arctan(cx)}{8c\,d^3} - \frac{b}{8c\,d^3\,(cx-i)^2} - \frac{ib}{8c\,d^3\,(cx-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(d+I*c*d*x)^3,x)
```

```
[Out] 1/2*I/c*a/d^3/(1+I*c*x)^2+1/2*I/c*b/d^3/(1+I*c*x)^2*arctan(c*x)-1/8*I*b*arc
tan(c*x)/c/d^3-1/8/c*b/d^3/(c*x-I)^2-1/8*I/c*b/d^3/(c*x-I)
```

maxima [A] time = 0.35, size = 66, normalized size = 0.72

$$-\frac{i\,bcx+\left(i\,bc^2x^2+2\,bcx+3i\,b\right)\arctan\left(cx\right)+4i\,a+2\,b}{8\,c^3d^3x^2-16i\,c^2d^3x-8\,cd^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -(I*b*c*x + (I*b*c^2*x^2 + 2*b*c*x + 3*I*b)*arctan(c*x) + 4*I*a + 2*b)/(8*c
^3*d^3*x^2 - 16*I*c^2*d^3*x - 8*c*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + c*d*x*1i)^3,x)
```

```
[Out] int((a + b*atan(c*x))/(d + c*d*x*1i)^3, x)
```

sympy [B] time = 3.69, size = 158, normalized size = 1.72

$$\frac{b\log\left(-icx+1\right)}{4c^3d^3x^2-8ic^2d^3x-4cd^3}-\frac{b\log\left(icx+1\right)}{4c^3d^3x^2-8ic^2d^3x-4cd^3}-\frac{b\left(\frac{\log\left(bx-\frac{ib}{c}\right)}{16}-\frac{\log\left(bx+\frac{ib}{c}\right)}{16}\right)}{cd^3}-\frac{-4ia-ibcx-2b}{-8c^3d^3x^2+16ic^2d^3x+8cd^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(d+I*c*d*x)**3,x)
```

```
[Out] b*log(-I*c*x + 1)/(4*c**3*d**3*x**2 - 8*I*c**2*d**3*x - 4*c*d**3) - b*log(I
*c*x + 1)/(4*c**3*d**3*x**2 - 8*I*c**2*d**3*x - 4*c*d**3) - b*(log(b*x - I*
b/c)/16 - log(b*x + I*b/c)/16)/(c*d**3) - (-4*I*a - I*b*c*x - 2*b)/(-8*c**3
*d**3*x**2 + 16*I*c**2*d**3*x + 8*c*d**3)
```

3.63 $\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)^3}\,dx$

Optimal. Leaf size=195

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^3(-cx+i)}-\frac{a+b\tan^{-1}(cx)}{2d^3(-cx+i)^2}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}+\frac{a\log(x)}{d^3}+\frac{ib\text{Li}_2(-icx)}{2d^3}-\frac{ib\text{Li}_2(icx)}{2d^3}+\frac{ib\text{Li}_2\left(1-\right.}{2d^3}$$

```
[Out] 1/8*I*b/d^3/(I-c*x)^2+5/8*b/d^3/(I-c*x)-5/8*b*arctan(c*x)/d^3+1/2*(-a-b*arc
tan(c*x))/d^3/(I-c*x)^2+I*(a+b*arctan(c*x))/d^3/(I-c*x)+a*ln(x)/d^3+(a+b*ar
ctan(c*x))*ln(2/(1+I*c*x))/d^3+1/2*I*b*polylog(2,-I*c*x)/d^3-1/2*I*b*polylo
g(2,I*c*x)/d^3+1/2*I*b*polylog(2,1-2/(1+I*c*x))/d^3
```

Rubi [A] time = 0.24, antiderivative size = 195, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4848, 2391, 4862, 627, 44, 203, 4854, 2402, 2315}

$$\frac{ib\text{PolyLog}(2,-icx)}{2d^3}-\frac{ib\text{PolyLog}(2,icx)}{2d^3}+\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2d^3}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{d^3(-cx+i)}-\frac{a+b\tan^{-1}(cx)}{2d^3(-cx+i)^2}+\frac{\log\left(\frac{2}{1+\right.}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + I*c*d*x)^3),x]
```

```
[Out] ((I/8)*b)/(d^3*(I - c*x)^2) + (5*b)/(8*d^3*(I - c*x)) - (5*b*ArcTan[c*x])/(
8*d^3) - (a + b*ArcTan[c*x])/(2*d^3*(I - c*x)^2) + (I*(a + b*ArcTan[c*x]))/
(d^3*(I - c*x)) + (a*Log[x])/d^3 + ((a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])
/d^3 + ((I/2)*b*PolyLog[2, (-I)*c*x])/d^3 - ((I/2)*b*PolyLog[2, I*c*x])/d^3
 + ((I/2)*b*PolyLog[2, 1 - 2/(1 + I*c*x)])/d^3
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x(d+icdx)^3}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^3x} + \frac{c\left(a+b\tan^{-1}(cx)\right)}{d^3(-i+cx)^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{d^3(-i+cx)^2} - \frac{c\left(a+b\tan^{-1}(cx)\right)}{d^3(-i+cx)}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^3} + \frac{(ic)\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{d^3} + \frac{c\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^3}\,dx}{d^3} - \frac{c\int \frac{a+b\tan^{-1}(cx)}{-i+cx}\,dx}{d^3}$$

$$= -\frac{a+b\tan^{-1}(cx)}{2d^3(i-cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} + \frac{a\log(x)}{d^3} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^3} + \cdots$$

$$= -\frac{a+b\tan^{-1}(cx)}{2d^3(i-cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} + \frac{a\log(x)}{d^3} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^3} + \cdots$$

$$= -\frac{a+b\tan^{-1}(cx)}{2d^3(i-cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} + \frac{a\log(x)}{d^3} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{d^3} + \cdots$$

$$= \frac{ib}{8d^3(i-cx)^2} + \frac{5b}{8d^3(i-cx)} - \frac{a+b\tan^{-1}(cx)}{2d^3(i-cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} + \frac{a\log(x)}{d^3} + \cdots$$

$$= \frac{ib}{8d^3(i-cx)^2} + \frac{5b}{8d^3(i-cx)} - \frac{5b\tan^{-1}(cx)}{8d^3} - \frac{a+b\tan^{-1}(cx)}{2d^3(i-cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} + \cdots$$

Mathematica [A] time = 0.24, size = 162, normalized size = 0.83

$$-\frac{\frac{8i(a+b\tan^{-1}(cx))}{cx-i}-\frac{4(a+b\tan^{-1}(cx))}{(cx-i)^2}+8\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right)+8a\log(x)+4ib\text{Li}_2(-icx)-4ib\text{Li}_2(icx)+4ib\text{L}}{8d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + I*c*d*x)^3),x]
```

```
[Out] ((5*b)/(I - c*x) + (I*b)/(-I + c*x)^2 - 5*b*ArcTan[c*x] - (4*(a + b*ArcTan[
c*x]))/(-I + c*x)^2 - ((8*I)*(a + b*ArcTan[c*x]))/(-I + c*x) + 8*a*Log[x] +
 8*(a + b*ArcTan[c*x])*Log[(2*I)/(I - c*x)] + (4*I)*b*PolyLog[2, (-I)*c*x]
- (4*I)*b*PolyLog[2, I*c*x] + (4*I)*b*PolyLog[2, (I + c*x)/(-I + c*x)])/(8*
d^3)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b\log\left(-\frac{cx+i}{cx-i}\right)-2i\,a}{2\,c^3d^3x^4-6i\,c^2d^3x^3-6\,cd^3x^2+2i\,d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*log(-(c*x + I)/(c*x - I)) - 2*I*a)/(2*c^3*d^3*x^4 - 6*I*c^2*d^
3*x^3 - 6*c*d^3*x^2 + 2*I*d^3*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.07, size = 327, normalized size = 1.68

$$\frac{a\ln(cx)}{d^3}-\frac{a}{2d^3(cx-i)^2}-\frac{ia}{d^3(cx-i)}-\frac{a\ln\left(c^2x^2+1\right)}{2d^3}+\frac{ib\ln(cx-i)\ln\left(-\frac{i(cx+i)}{2}\right)}{2d^3}+\frac{b\ln(cx)\arctan(cx)}{d^3}-\frac{b\arctan(cx}{2d^3(cx-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(d+I*c*d*x)^3,x)
```

```
[Out] a/d^3*ln(c*x)-1/2*a/d^3/(c*x-I)^2-I*a/d^3/(c*x-I)-1/2*a/d^3*ln(c^2*x^2+1)+1
/2*I*b/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))+b/d^3*ln(c*x)*arctan(c*x)-1/2*b/d^3
*arctan(c*x)/(c*x-I)^2+1/8*I*b/d^3/(c*x-I)^2-b/d^3*arctan(c*x)*ln(c*x-I)-5/
8*b*arctan(c*x)/d^3-I*b/d^3*arctan(c*x)/(c*x-I)-5/8*b/d^3/(c*x-I)-1/4*I*b/d
^3*ln(c*x-I)^2-1/2*I*b/d^3*ln(c*x)*ln(-I*(I+c*x))-1/2*I*b/d^3*dilog(-I*c*x)
+1/2*I*b/d^3*dilog(-1/2*I*(I+c*x))+1/2*I*b/d^3*ln(c*x)*ln(-I*(-c*x+I))-I*a/
d^3*arctan(c*x)-1/2*I*b/d^3*dilog(-I*(I+c*x))-1/2*I*b/d^3*ln(-I*c*x)*ln(-I*
(-c*x+I))
```

maxima [B] time = 0.42, size = 399, normalized size = 2.05

$$-\frac{(16i\,a+10\,b)cx+\left(4i\,bc^2x^2+8\,bcx-4i\,b\right)\arctan(cx)^2+\left(i\,bc^2x^2+2\,bcx-i\,b\right)\log\left(c^2x^2+1\right)^2+\left(4\,bc^2x^2-8i\,b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -((16*I*a + 10*b)*c*x + (4*I*b*c^2*x^2 + 8*b*c*x - 4*I*b)*arctan(c*x)^2 + (
I*b*c^2*x^2 + 2*b*c*x - I*b)*log(c^2*x^2 + 1)^2 + (4*b*c^2*x^2 - 8*I*b*c*x
- 4*b)*arctan(c*x)*log(1/4*c^2*x^2 + 1/4) - (16*b*c^2*x^2 - 32*I*b*c*x - 16
*b)*arctan(c*x)*log(c*x) + ((16*I*a + 5*b)*c^2*x^2 + 2*(16*a + 3*I*b)*c*x -
 16*I*a + 19*b)*arctan(c*x) - (5*b*c^2*x^2 - 10*I*b*c*x - 5*b)*arctan2(c*x,
 -1) + (8*I*b*c^2*x^2 + 16*b*c*x - 8*I*b)*dilog(I*c*x + 1) + (-8*I*b*c^2*x^
2 - 16*b*c*x + 8*I*b)*dilog(1/2*I*c*x + 1/2) + (-8*I*b*c^2*x^2 - 16*b*c*x +
 8*I*b)*dilog(-I*c*x + 1) + (4*(pi*b + 2*a)*c^2*x^2 + (-8*I*pi*b - 16*I*a)*
c*x - 4*pi*b + (-2*I*b*c^2*x^2 - 4*b*c*x + 2*I*b)*log(1/4*c^2*x^2 + 1/4) -
8*a)*log(c^2*x^2 + 1) - 16*(a*c^2*x^2 - 2*I*a*c*x - a)*log(x) + 24*a - 12*I
*b)/(16*c^2*d^3*x^2 - 32*I*c*d^3*x - 16*d^3)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + c*d*x*1i)^3),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + c*d*x*1i)^3), x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.64 $\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)^3}\,dx$

Optimal. Leaf size=250

$$\frac{2c\left(a+b\tan^{-1}(cx)\right)}{d^3(-cx+i)}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{2d^3(-cx+i)^2}-\frac{a+b\tan^{-1}(cx)}{d^3x}-\frac{3ic\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}-\frac{3iac\log(x)}{d^3}-\frac{bc\log}{}$$

```
[Out] 1/8*b*c/d^3/(I-c*x)^2-9/8*I*b*c/d^3/(I-c*x)+9/8*I*b*c*arctan(c*x)/d^3+(-a-b
*arctan(c*x))/d^3/x+1/2*I*c*(a+b*arctan(c*x))/d^3/(I-c*x)^2+2*c*(a+b*arctan
(c*x))/d^3/(I-c*x)-3*I*a*c*ln(x)/d^3+b*c*ln(x)/d^3-3*I*c*(a+b*arctan(c*x))*
ln(2/(1+I*c*x))/d^3-1/2*b*c*ln(c^2*x^2+1)/d^3+3/2*b*c*polylog(2,-I*c*x)/d^3
-3/2*b*c*polylog(2,I*c*x)/d^3+3/2*b*c*polylog(2,1-2/(1+I*c*x))/d^3
```

Rubi [A] time = 0.29, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 15, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.652, Rules used = {4876, 4852, 266, 36, 29, 31, 4848, 2391, 4862, 627, 44, 203, 4854, 2402, 2315}

$$\frac{3bc\text{PolyLog}(2,-icx)}{2d^3}-\frac{3bc\text{PolyLog}(2,icx)}{2d^3}+\frac{3bc\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2d^3}+\frac{2c\left(a+b\tan^{-1}(cx)\right)}{d^3(-cx+i)}+\frac{ic\left(a+b\tan^{-1}(cx)\right)}{2d^3(-cx+i)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + I*c*d*x)^3),x]
```

```
[Out] (b*c)/(8*d^3*(I - c*x)^2) - (((9*I)/8)*b*c)/(d^3*(I - c*x)) + (((9*I)/8)*b*
c*ArcTan[c*x])/d^3 - (a + b*ArcTan[c*x])/(d^3*x) + ((I/2)*c*(a + b*ArcTan[c
*x]))/(d^3*(I - c*x)^2) + (2*c*(a + b*ArcTan[c*x]))/(d^3*(I - c*x)) - ((3*I
)*a*c*Log[x])/d^3 + (b*c*Log[x])/d^3 - ((3*I)*c*(a + b*ArcTan[c*x])*Log[2/(
1 + I*c*x)])/d^3 - (b*c*Log[1 + c^2*x^2])/(2*d^3) + (3*b*c*PolyLog[2, (-I)*
c*x])/(2*d^3) - (3*b*c*PolyLog[2, I*c*x])/(2*d^3) + (3*b*c*PolyLog[2, 1 - 2
/(1 + I*c*x)])/(2*d^3)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
```

```
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2(d+icdx)^3}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^3x^2} - \frac{3ic\left(a+b\tan^{-1}(cx)\right)}{d^3x} - \frac{ic^2\left(a+b\tan^{-1}(cx)\right)}{d^3(-i+cx)^3} + \frac{2c^2\left(a+b\tan^{-1}(cx\right.}{d^3(-i+cx)^2}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d^3} - \frac{(3ic)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^3} - \frac{\left(ic^2\right)\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^3}\,dx}{d^3} + \frac{\left(3ic^2\right)\int \frac{a+b\tan^{-1}(cx)}{-i+cx}}{d^3}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2d^3(i-cx)^2} + \frac{2c\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} - \frac{3iac\log(x)}{d^3} - \frac{3ic\left(a+b\right.}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2d^3(i-cx)^2} + \frac{2c\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} - \frac{3iac\log(x)}{d^3} - \frac{3ic\left(a+b\right.}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2d^3(i-cx)^2} + \frac{2c\left(a+b\tan^{-1}(cx)\right)}{d^3(i-cx)} - \frac{3iac\log(x)}{d^3} - \frac{3ic\left(a+b\right.}{}$$

$$= \frac{bc}{8d^3(i-cx)^2} - \frac{9ibc}{8d^3(i-cx)} - \frac{a+b\tan^{-1}(cx)}{d^3x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2d^3(i-cx)^2} + \frac{2c\left(a+b\tan^{-1}(cx\right.}{d^3(i-cx)}$$

$$= \frac{bc}{8d^3(i-cx)^2} - \frac{9ibc}{8d^3(i-cx)} + \frac{9ibc\tan^{-1}(cx)}{8d^3} - \frac{a+b\tan^{-1}(cx)}{d^3x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)}{2d^3(i-cx)^2} + \frac{2}{}$$

Mathematica [A] time = 0.33, size = 227, normalized size = 0.91

$$-\frac{8\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{16c\left(a+b\tan^{-1}(cx)\right)}{cx-i} + \frac{4ic\left(a+b\tan^{-1}(cx)\right)}{(cx-i)^2} - 24ic\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right) - 24iac\log(x) + 4bc\left(2\log\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + I*c*d*x)^3),x]
```

```
[Out] ((-8*I)*b*c*((I - c*x)^(-1) - ArcTan[c*x]) - (8*(a + b*ArcTan[c*x]))/x + ((
4*I)*c*(a + b*ArcTan[c*x]))/(-I + c*x)^2 - (16*c*(a + b*ArcTan[c*x]))/(-I +
 c*x) + (b*c*(2 + I*c*x + I*(-I + c*x)^2*ArcTan[c*x]))/(-I + c*x)^2 - (24*I
)*a*c*Log[x] - (24*I)*c*(a + b*ArcTan[c*x])*Log[(2*I)/(I - c*x)] + 4*b*c*(2
*Log[x] - Log[1 + c^2*x^2]) + 12*b*c*PolyLog[2, (-I)*c*x] - 12*b*c*PolyLog[
2, I*c*x] + 12*b*c*PolyLog[2, (I + c*x)/(-I + c*x)])/(8*d^3)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b\log\left(-\frac{cx+i}{cx-i}\right) - 2i\,a}{2\,c^3d^3x^5 - 6i\,c^2d^3x^4 - 6\,cd^3x^3 + 2i\,d^3x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*log(-(c*x + I)/(c*x - I)) - 2*I*a)/(2*c^3*d^3*x^5 - 6*I*c^2*d^
3*x^4 - 6*c*d^3*x^3 + 2*I*d^3*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.08, size = 394, normalized size = 1.58

$$-\frac{a}{d^3x}-\frac{3icb\arctan(cx)\ln(cx)}{d^3}+\frac{icb\arctan(cx)}{2d^3(cx-i)^2}+\frac{9ibc\arctan(cx)}{8d^3}-\frac{3ca\arctan(cx)}{d^3}-\frac{2ca}{d^3(cx-i)}-\frac{b\arctan(cx)}{d^3x}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^3,x)
```

```
[Out] -a/d^3/x-3*I*c*b/d^3*arctan(c*x)*ln(c*x)+1/2*I*c*b/d^3*arctan(c*x)/(c*x-I)^
2+9/8*I*b*c*arctan(c*x)/d^3-3*c*a/d^3*arctan(c*x)-2*c*a/d^3/(c*x-I)-b/d^3*a
rctan(c*x)/x+3*I*c*b/d^3*arctan(c*x)*ln(c*x-I)+9/8*I*c*b/d^3/(c*x-I)+3/2*I*
c*a/d^3*ln(c^2*x^2+1)-2*c*b/d^3*arctan(c*x)/(c*x-I)+c*b/d^3*ln(c*x)-1/2*b*c
*ln(c^2*x^2+1)/d^3+1/2*I*c*a/d^3/(c*x-I)^2-3*I*c*a/d^3*ln(c*x)+1/8*c*b/d^3/
(c*x-I)^2-3/2*c*b/d^3*dilog(-I*(I+c*x))-3/2*c*b/d^3*ln(c*x)*ln(-I*(I+c*x))+
3/2*c*b/d^3*ln(-I*(-c*x+I))*ln(c*x)-3/2*c*b/d^3*ln(-I*(-c*x+I))*ln(-I*c*x)-
3/2*c*b/d^3*dilog(-I*c*x)+3/2*c*b/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))+3/2*c*b/
d^3*dilog(-1/2*I*(I+c*x))-3/4*c*b/d^3*ln(c*x-I)^2
```

maxima [B] time = 0.43, size = 519, normalized size = 2.08

$$-\frac{17i\,bc^3x^3\arctan(1,cx)+(b(34\arctan(1,cx)-18i)+48\,a)c^2x^2+(b(-17i\arctan(1,cx)-20)-72i\,a)cx+(}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -1/16*(17*I*b*c^3*x^3*arctan2(1, c*x) + (b*(34*arctan2(1, c*x) - 18*I) + 48
*a)*c^2*x^2 + (b*(-17*I*arctan2(1, c*x) - 20) - 72*I*a)*c*x + (12*b*c^3*x^3
 - 24*I*b*c^2*x^2 - 12*b*c*x)*arctan(c*x)^2 + (3*b*c^3*x^3 - 6*I*b*c^2*x^2
- 3*b*c*x)*log(c^2*x^2 + 1)^2 + (-12*I*b*c^3*x^3 - 24*b*c^2*x^2 + 12*I*b*c*
x)*arctan(c*x)*log(1/4*c^2*x^2 + 1/4) + (48*I*b*c^3*x^3 + 96*b*c^2*x^2 - 48
*I*b*c*x)*arctan(c*x)*log(c*x) + ((48*a - I*b)*c^3*x^3 + (-96*I*a + 46*b)*c
^2*x^2 - (48*a + 71*I*b)*c*x - 16*b)*arctan(c*x) + (24*b*c^3*x^3 - 48*I*b*c
^2*x^2 - 24*b*c*x)*dilog(I*c*x + 1) - (24*b*c^3*x^3 - 48*I*b*c^2*x^2 - 24*b
*c*x)*dilog(1/2*I*c*x + 1/2) - (24*b*c^3*x^3 - 48*I*b*c^2*x^2 - 24*b*c*x)*d
ilog(-I*c*x + 1) - (4*((3*I*pi - 2)*b + 6*I*a)*c^3*x^3 + ((24*pi + 16*I)*b
+ 48*a)*c^2*x^2 + 4*((-3*I*pi + 2)*b - 6*I*a)*c*x + (6*b*c^3*x^3 - 12*I*b*c
^2*x^2 - 6*b*c*x)*log(1/4*c^2*x^2 + 1/4))*log(c^2*x^2 + 1) + ((48*I*a - 16*
b)*c^3*x^3 + 32*(3*a + I*b)*c^2*x^2 + (-48*I*a + 16*b)*c*x)*log(x) - 16*a)/
(c^2*d^3*x^3 - 2*I*c*d^3*x^2 - d^3*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^2\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + c*d*x*1i)^3),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + c*d*x*1i)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.65 $\int \frac{a+b\tan^{-1}(cx)}{x^3(d+icdx)^3}\,dx$

Optimal. Leaf size=306

$$-\frac{3ic^2\left(a+b\tan^{-1}(cx)\right)}{d^3(-cx+i)}+\frac{c^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(-cx+i)^2}-\frac{6c^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}-\frac{a+b\tan^{-1}(cx)}{2d^3x^2}+\frac{3ic\left(a+b\,\mathrm{ta}\right.}{d^3x}$$

```
[Out] -1/2*b*c/d^3/x-1/8*I*b*c^2/d^3/(I-c*x)^2-13/8*b*c^2/d^3/(I-c*x)+9/8*b*c^2*a
rctan(c*x)/d^3+1/2*(-a-b*arctan(c*x))/d^3/x^2+3*I*c*(a+b*arctan(c*x))/d^3/x
+1/2*c^2*(a+b*arctan(c*x))/d^3/(I-c*x)^2-3*I*c^2*(a+b*arctan(c*x))/d^3/(I-c
*x)-6*a*c^2*ln(x)/d^3-3*I*b*c^2*ln(x)/d^3-6*c^2*(a+b*arctan(c*x))*ln(2/(1+I
*c*x))/d^3+3/2*I*b*c^2*ln(c^2*x^2+1)/d^3-3*I*b*c^2*polylog(2,-I*c*x)/d^3+3*
I*b*c^2*polylog(2,I*c*x)/d^3-3*I*b*c^2*polylog(2,1-2/(1+I*c*x))/d^3
```

Rubi [A] time = 0.32, antiderivative size = 306, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 16, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.696, Rules used = {4876, 4852, 325, 203, 266, 36, 29, 31, 4848, 2391, 4862, 627, 44, 4854, 2402, 2315}

$$-\frac{3ibc^2\mathrm{PolyLog}(2,-icx)}{d^3}+\frac{3ibc^2\mathrm{PolyLog}(2,icx)}{d^3}-\frac{3ibc^2\mathrm{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{d^3}-\frac{3ic^2\left(a+b\tan^{-1}(cx)\right)}{d^3(-cx+i)}+\frac{c^2\left(a+\right.}{2d^3(}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + I*c*d*x)^3),x]
```

```
[Out] -(b*c)/(2*d^3*x) - ((I/8)*b*c^2)/(d^3*(I - c*x)^2) - (13*b*c^2)/(8*d^3*(I -
 c*x)) + (9*b*c^2*ArcTan[c*x])/(8*d^3) - (a + b*ArcTan[c*x])/(2*d^3*x^2) +
((3*I)*c*(a + b*ArcTan[c*x]))/(d^3*x) + (c^2*(a + b*ArcTan[c*x]))/(2*d^3*(I
 - c*x)^2) - ((3*I)*c^2*(a + b*ArcTan[c*x]))/(d^3*(I - c*x)) - (6*a*c^2*Log
[x])/d^3 - ((3*I)*b*c^2*Log[x])/d^3 - (6*c^2*(a + b*ArcTan[c*x])*Log[2/(1 +
 I*c*x)])/d^3 + (((3*I)/2)*b*c^2*Log[1 + c^2*x^2])/d^3 - ((3*I)*b*c^2*PolyL
og[2, (-I)*c*x]])/d^3 + ((3*I)*b*c^2*PolyLog[2, I*c*x]])/d^3 - ((3*I)*b*c^2*P
olyLog[2, 1 - 2/(1 + I*c*x)])/d^3
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
```

```
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3(d+icdx)^3}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^3x^3} - \frac{3ic\left(a+b\tan^{-1}(cx)\right)}{d^3x^2} - \frac{6c^2\left(a+b\tan^{-1}(cx)\right)}{d^3x} - \frac{c^3\left(a+b\tan^{-1}(\right.}{d^3(-i+cx)^3}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d^3} - \frac{(3ic)\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d^3} - \frac{\left(6c^2\right)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^3} - \frac{\left(3ic^3\right)\int \frac{a+b\tan^{-1}(}{(-i+cx)^2}}{d^3}$$

$$= -\frac{a+b\tan^{-1}(cx)}{2d^3x^2} + \frac{3ic\left(a+b\tan^{-1}(cx)\right)}{d^3x} + \frac{c^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(i-cx)^2} - \frac{3ic^2\left(a+b\tan^{-1}(c\right.}{d^3(i-cx)}$$

$$= -\frac{bc}{2d^3x} - \frac{a+b\tan^{-1}(cx)}{2d^3x^2} + \frac{3ic\left(a+b\tan^{-1}(cx)\right)}{d^3x} + \frac{c^2\left(a+b\tan^{-1}(cx)\right)}{2d^3(i-cx)^2} - \frac{3ic^2\left(a+b\right.}{d^3(i-}$$

$$= -\frac{bc}{2d^3x} - \frac{bc^2\tan^{-1}(cx)}{2d^3} - \frac{a+b\tan^{-1}(cx)}{2d^3x^2} + \frac{3ic\left(a+b\tan^{-1}(cx)\right)}{d^3x} + \frac{c^2\left(a+b\tan^{-1}(cx\right.}{2d^3(i-cx)^2}$$

$$= -\frac{bc}{2d^3x} - \frac{ibc^2}{8d^3(i-cx)^2} - \frac{13bc^2}{8d^3(i-cx)} - \frac{bc^2\tan^{-1}(cx)}{2d^3} - \frac{a+b\tan^{-1}(cx)}{2d^3x^2} + \frac{3ic\left(a+b\tan\right.}{d^3x}$$

$$= -\frac{bc}{2d^3x} - \frac{ibc^2}{8d^3(i-cx)^2} - \frac{13bc^2}{8d^3(i-cx)} + \frac{9bc^2\tan^{-1}(cx)}{8d^3} - \frac{a+b\tan^{-1}(cx)}{2d^3x^2} + \frac{3ic\left(a+b\,t\right.}{d^3}$$

Mathematica [C] time = 0.59, size = 285, normalized size = 0.93

$$-\frac{-\frac{24ic^2\left(a+b\tan^{-1}(cx)\right)}{cx-i} - \frac{4c^2\left(a+b\tan^{-1}(cx)\right)}{(cx-i)^2} + 48c^2\log\left(\frac{2i}{-cx+i}\right)\left(a+b\tan^{-1}(cx)\right) + \frac{4\left(a+b\tan^{-1}(cx)\right)}{x^2} - \frac{24ic\left(a+b\tan^{-1}(cx)\right)}{x} + }{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + I*c*d*x)^3),x]
```

```
[Out] -1/8*(12*b*c^2*((I - c*x)^(-1) - ArcTan[c*x]) + (4*(a + b*ArcTan[c*x]))/x^2
 - ((24*I)*c*(a + b*ArcTan[c*x]))/x - (4*c^2*(a + b*ArcTan[c*x]))/(-I + c*x
)^2 - ((24*I)*c^2*(a + b*ArcTan[c*x]))/(-I + c*x) - (b*c^2*(-2*I + c*x + (-
I + c*x)^2*ArcTan[c*x]))/(-I + c*x)^2 + (4*b*c*Hypergeometric2F1[-1/2, 1, 1
/2, -(c^2*x^2)])/x + 48*a*c^2*Log[x] + 48*c^2*(a + b*ArcTan[c*x])*Log[(2*I)
```

```
/(I - c*x)] + (12*I)*b*c^2*(2*Log[x] - Log[1 + c^2*x^2]) + (24*I)*b*c^2*Pol
yLog[2, (-I)*c*x] - (24*I)*b*c^2*PolyLog[2, I*c*x] + (24*I)*b*c^2*PolyLog[2
, (I + c*x)/(-I + c*x)])/d^3
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b\log\left(-\frac{cx+i}{cx-i}\right)-2i\,a}{2\,c^3d^3x^6-6i\,c^2d^3x^5-6\,cd^3x^4+2i\,d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral(-(b*log(-(c*x + I)/(c*x - I)) - 2*I*a)/(2*c^3*d^3*x^6 - 6*I*c^2*d^
3*x^5 - 6*c*d^3*x^4 + 2*I*d^3*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.10, size = 481, normalized size = 1.57

$$-\frac{a}{2d^3x^2}+\frac{13c^2b}{8d^3\,(cx-i)}+\frac{c^2a}{2d^3\,(cx-i)^2}+\frac{3c^2a\ln\left(c^2x^2+1\right)}{d^3}-\frac{6c^2a\ln\left(cx\right)}{d^3}-\frac{b\arctan\left(cx\right)}{2d^3x^2}-\frac{3ic^2b\ln\left(cx\right)}{d^3}+\frac{3ic^2a}{d^3\,(cx-i)}+\frac{3}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^3,x)
```

```
[Out] -1/2*a/d^3/x^2+3/2*I*b*c^2*ln(c^2*x^2+1)/d^3+3*c^2*a/d^3*ln(c^2*x^2+1)+13/8
*c^2*b/d^3/(c*x-I)-6*c^2*a/d^3*ln(c*x)+1/2*c^2*a/d^3/(c*x-I)^2-1/2*b/d^3*ar
ctan(c*x)/x^2-1/8*I*c^2*b/d^3/(c*x-I)^2-3*I*c^2*b/d^3*dilog(-1/2*I*(I+c*x))
+3/2*I*c^2*b/d^3*ln(c*x-I)^2-3*I*c^2*b/d^3*ln(c*x)+3*I*c^2*a/d^3/(c*x-I)+3*
I*c*a/d^3/x+3*I*c^2*b/d^3*dilog(-I*(I+c*x))-6*c^2*b/d^3*ln(c*x)*arctan(c*x)
+6*c^2*b/d^3*arctan(c*x)*ln(c*x-I)+1/2*c^2*b/d^3*arctan(c*x)/(c*x-I)^2+3*I*
c^2*b/d^3*arctan(c*x)/(c*x-I)+3*I*c*b/d^3*arctan(c*x)/x-3*I*c^2*b/d^3*ln(c*
x)*ln(-I*(-c*x+I))-3*I*c^2*b/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/2*b*c/d^3/x
+9/8*b*c^2*arctan(c*x)/d^3+3*I*c^2*b/d^3*ln(-I*c*x)*ln(-I*(-c*x+I))+3*I*c^2
*b/d^3*ln(c*x)*ln(-I*(I+c*x))+6*I*c^2*a/d^3*arctan(c*x)+3*I*c^2*b/d^3*dilog
(-I*c*x)
```

maxima [B] time = 0.44, size = 594, normalized size = 1.94

$$-\frac{33\,bc^4x^4\arctan\left(1,cx\right)+6\,(b(-11i\,\arctan\left(1,cx\right)-3)-16i\,a)c^3x^3-(b(33\,\arctan\left(1,cx\right)-12i)+144\,a)c^2x^2-(-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -1/16*(33*b*c^4*x^4*arctan2(1, c*x) + 6*(b*(-11*I*arctan2(1, c*x) - 3) - 16
*I*a)*c^3*x^3 - (b*(33*arctan2(1, c*x) - 12*I) + 144*a)*c^2*x^2 - (-32*I*a
+ 8*b)*c*x - (24*I*b*c^4*x^4 + 48*b*c^3*x^3 - 24*I*b*c^2*x^2)*arctan(c*x)^2
 - (6*I*b*c^4*x^4 + 12*b*c^3*x^3 - 6*I*b*c^2*x^2)*log(c^2*x^2 + 1)^2 - (24*
```

```
b*c^4*x^4 - 48*I*b*c^3*x^3 - 24*b*c^2*x^2)*arctan(c*x)*log(1/4*c^2*x^2 + 1/
4) + (96*b*c^4*x^4 - 192*I*b*c^3*x^3 - 96*b*c^2*x^2)*arctan(c*x)*log(c*x) -
 ((96*I*a - 15*b)*c^4*x^4 + 6*(32*a + 21*I*b)*c^3*x^3 + (-96*I*a + 159*b)*c
^2*x^2 - 32*I*b*c*x + 8*b)*arctan(c*x) - (48*I*b*c^4*x^4 + 96*b*c^3*x^3 - 4
8*I*b*c^2*x^2)*dilog(I*c*x + 1) - (-48*I*b*c^4*x^4 - 96*b*c^3*x^3 + 48*I*b*
c^2*x^2)*dilog(1/2*I*c*x + 1/2) - (-48*I*b*c^4*x^4 - 96*b*c^3*x^3 + 48*I*b*
c^2*x^2)*dilog(-I*c*x + 1) - (((24*pi + 24*I)*b + 48*a)*c^4*x^4 - 48*((I*pi
 - 1)*b + 2*I*a)*c^3*x^3 - ((24*pi + 24*I)*b + 48*a)*c^2*x^2 + (-12*I*b*c^4
*x^4 - 24*b*c^3*x^3 + 12*I*b*c^2*x^2)*log(1/4*c^2*x^2 + 1/4))*log(c^2*x^2 +
 1) + (48*(2*a + I*b)*c^4*x^4 - (192*I*a - 96*b)*c^3*x^3 - 48*(2*a + I*b)*c
^2*x^2)*log(x) - 8*a)/(c^2*d^3*x^4 - 2*I*c*d^3*x^3 - d^3*x^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^3\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + c*d*x*1i)^3),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + c*d*x*1i)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\left(\int \frac{a}{c^{3}x^{6}-3ic^{2}x^{5}-3cx^{4}+ix^{3}}\,dx+\int \frac{b\,\mathrm{atan}\,(cx)}{c^{3}x^{6}-3ic^{2}x^{5}-3cx^{4}+ix^{3}}\,dx\right)}{d^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(d+I*c*d*x)**3,x)
```

```
[Out] I*(Integral(a/(c**3*x**6 - 3*I*c**2*x**5 - 3*c*x**4 + I*x**3), x) + Integra
l(b*atan(c*x)/(c**3*x**6 - 3*I*c**2*x**5 - 3*c*x**4 + I*x**3), x))/d**3
```

3.66 $\int \frac{a+b\tan^{-1}(cx)}{(1+icx)^4}\,dx$

Optimal. Leaf size=100

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{3c(1+icx)^3}+\frac{ib}{24c(-cx+i)}-\frac{b}{24c(-cx+i)^2}-\frac{ib}{18c(-cx+i)^3}-\frac{ib\tan^{-1}(cx)}{24c}$$

```
[Out] -1/18*I*b/c/(I-c*x)^3-1/24*b/c/(I-c*x)^2+1/24*I*b/c/(I-c*x)-1/24*I*b*arctan
(c*x)/c+1/3*I*(a+b*arctan(c*x))/c/(1+I*c*x)^3
```

Rubi [A] time = 0.05, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {4862, 627, 44, 203}

$$\frac{i\left(a+b\tan^{-1}(cx)\right)}{3c(1+icx)^3}+\frac{ib}{24c(-cx+i)}-\frac{b}{24c(-cx+i)^2}-\frac{ib}{18c(-cx+i)^3}-\frac{ib\tan^{-1}(cx)}{24c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(1 + I*c*x)^4,x]
```

```
[Out] ((-I/18)*b)/(c*(I - c*x)^3) - b/(24*c*(I - c*x)^2) + ((I/24)*b)/(c*(I - c*x
)) - ((I/24)*b*ArcTan[c*x])/c + ((I/3)*(a + b*ArcTan[c*x]))/(c*(1 + I*c*x)^
3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
 + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{a+b\tan^{-1}(cx)}{(1+icx)^4}\,dx &= \frac{i\left(a+b\tan^{-1}(cx)\right)}{3c(1+icx)^3}-\frac{1}{3}(ib)\int \frac{1}{(1+icx)^3\left(1+c^2x^2\right)}\,dx\\ &= \frac{i\left(a+b\tan^{-1}(cx)\right)}{3c(1+icx)^3}-\frac{1}{3}(ib)\int \frac{1}{(1-icx)(1+icx)^4}\,dx\\ &= \frac{i\left(a+b\tan^{-1}(cx)\right)}{3c(1+icx)^3}-\frac{1}{3}(ib)\int \left(\frac{1}{2(-i+cx)^4}+\frac{i}{4(-i+cx)^3}-\frac{1}{8(-i+cx)^2}+\frac{1}{8\left(1+c^2x^2\right.}\right.\\ &= -\frac{ib}{18c(i-cx)^3}-\frac{b}{24c(i-cx)^2}+\frac{ib}{24c(i-cx)}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{3c(1+icx)^3}-\frac{1}{24}(ib)\int \frac{1}{1+c^2x^2}\\ &= -\frac{ib}{18c(i-cx)^3}-\frac{b}{24c(i-cx)^2}+\frac{ib}{24c(i-cx)}-\frac{ib\tan^{-1}(cx)}{24c}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{3c(1+icx)^3}\end{aligned}$$

Mathematica [A] time = 0.05, size = 73, normalized size = 0.73

$$\frac{-24a+b\left(-3ic^2x^2-9cx+10i\right)+3b\left(-ic^3x^3-3c^2x^2+3icx-7\right)\tan^{-1}(cx)}{72c(cx-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(1 + I*c*x)^4,x]
```

```
[Out] (-24*a + b*(10*I - 9*c*x - (3*I)*c^2*x^2) + 3*b*(-7 + (3*I)*c*x - 3*c^2*x^2
 - I*c^3*x^3)*ArcTan[c*x])/(72*c*(-I + c*x)^3)
```

fricas [A] time = 0.43, size = 93, normalized size = 0.93

$$\frac{-6i\,bc^2x^2-18\,bcx+\left(3\,bc^3x^3-9i\,bc^2x^2-9\,bcx-21i\,b\right)\log\left(-\frac{cx+i}{cx-i}\right)-48\,a+20i\,b}{144\,c^4x^3-432i\,c^3x^2-432\,c^2x+144i\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(1+I*c*x)^4,x, algorithm="fricas")
```

```
[Out] (-6*I*b*c^2*x^2 - 18*b*c*x + (3*b*c^3*x^3 - 9*I*b*c^2*x^2 - 9*b*c*x - 21*I*
b)*log(-(c*x + I)/(c*x - I)) - 48*a + 20*I*b)/(144*c^4*x^3 - 432*I*c^3*x^2
- 432*c^2*x + 144*I*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(1+I*c*x)^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 93, normalized size = 0.93

$$\frac{ia}{3c\,(icx+1)^3}+\frac{ib\arctan(cx)}{3c\,(icx+1)^3}-\frac{ib\arctan(cx)}{24c}-\frac{b}{24c\,(cx-i)^2}+\frac{ib}{18c\,(cx-i)^3}-\frac{ib}{24c\,(cx-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(1+I*c*x)^4,x)
```

```
[Out] 1/3*I/c*a/(1+I*c*x)^3+1/3*I/c*b/(1+I*c*x)^3*arctan(c*x)-1/24*I*b*arctan(c*x
)/c-1/24/c*b/(c*x-I)^2+1/18*I/c*b/(c*x-I)^3-1/24*I/c*b/(c*x-I)
```

maxima [A] time = 0.33, size = 83, normalized size = 0.83

$$-\frac{3i\,bc^2x^2 + 9\,bcx + \left(3i\,bc^3x^3 + 9\,bc^2x^2 - 9i\,bcx + 21\,b\right)\arctan\left(cx\right) + 24\,a - 10i\,b}{72\,c^4x^3 - 216i\,c^3x^2 - 216\,c^2x + 72i\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(1+I*c*x)^4,x, algorithm="maxima")
```

```
[Out] -(3*I*b*c^2*x^2 + 9*b*c*x + (3*I*b*c^3*x^3 + 9*b*c^2*x^2 - 9*I*b*c*x + 21*b
)*arctan(c*x) + 24*a - 10*I*b)/(72*c^4*x^3 - 216*I*c^3*x^2 - 216*c^2*x + 72
*I*c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\mathrm{atan}\left(c\,x\right)}{{\left(1 + c\,x\,1\mathrm{i}\right)}^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(c*x*1i + 1)^4,x)
```

```
[Out] int((a + b*atan(c*x))/(c*x*1i + 1)^4, x)
```

sympy [B] time = 4.27, size = 168, normalized size = 1.68

$$-\frac{ib\log\left(-icx + 1\right)}{6c^4x^3 - 18ic^3x^2 - 18c^2x + 6ic} + \frac{ib\log\left(icx + 1\right)}{6c^4x^3 - 18ic^3x^2 - 18c^2x + 6ic} + \frac{b\left(-\frac{\log\left(bx - \frac{ib}{c}\right)}{48} + \frac{\log\left(bx + \frac{ib}{c}\right)}{48}\right)}{c} + \frac{24a + 3ibc^2x^2 \cdots}{-72c^4x^3 + 216ic^3x^{\cdots}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(1+I*c*x)**4,x)
```

```
[Out] -I*b*log(-I*c*x + 1)/(6*c**4*x**3 - 18*I*c**3*x**2 - 18*c**2*x + 6*I*c) + I
*b*log(I*c*x + 1)/(6*c**4*x**3 - 18*I*c**3*x**2 - 18*c**2*x + 6*I*c) + b*(-
log(b*x - I*b/c)/48 + log(b*x + I*b/c)/48)/c + (24*a + 3*I*b*c**2*x**2 + 9*
b*c*x - 10*I*b)/(-72*c**4*x**3 + 216*I*c**3*x**2 + 216*c**2*x - 72*I*c)
```

3.67 $\int \frac{\tan^{-1}(ax)}{cx+iacx^2} \, dx$

Optimal. Leaf size=49

$$\frac{i\mathrm{Li}_2\left(\frac{2}{iax+1}-1\right)}{2c}+\frac{\log\left(2-\frac{2}{1+iax}\right)\tan^{-1}(ax)}{c}$$

```
[Out] arctan(a*x)*ln(2-2/(1+I*a*x))/c+1/2*I*polylog(2,-1+2/(1+I*a*x))/c
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {1593, 4868, 2447}

$$\frac{i\text{PolyLog}\left(2,-1+\frac{2}{1+iax}\right)}{2c}+\frac{\log\left(2-\frac{2}{1+iax}\right)\tan^{-1}(ax)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(c*x + I*a*c*x^2),x]
```

```
[Out] (ArcTan[a*x]*Log[2 - 2/(1 + I*a*x)])/c + ((I/2)*PolyLog[2, -1 + 2/(1 + I*a*
x)])/c
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\tan^{-1}(ax)}{cx+iacx^2} \, dx &= \int \frac{\tan^{-1}(ax)}{x(c+iacx)} \, dx \\
&= \frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1+iax}\right)}{c}-\frac{a\int \frac{\log\left(2-\frac{2}{1+iax}\right)}{1+a^2x^2} \, dx}{c} \\
&= \frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1+iax}\right)}{c}+\frac{i\mathrm{Li}_2\left(-1+\frac{2}{1+iax}\right)}{2c}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 88, normalized size = 1.80

$$\frac{i\text{Li}_2(-iax)}{2c}-\frac{i\text{Li}_2(iax)}{2c}+\frac{i\text{Li}_2\left(-\frac{ax+i}{i-ax}\right)}{2c}+\frac{\log\left(\frac{2i}{-ax+i}\right)\tan^{-1}(ax)}{c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(c*x + I*a*c*x^2),x]
```

```
[Out] (ArcTan[a*x]*Log[(2*I)/(I - a*x)])/c + ((I/2)*PolyLog[2, (-I)*a*x])/c - ((I
/2)*PolyLog[2, I*a*x])/c + ((I/2)*PolyLog[2, -((I + a*x)/(I - a*x))])/c
```

fricas [A] time = 0.47, size = 21, normalized size = 0.43

$$-\frac{i\,\text{Li}_2\left(\frac{ax+i}{ax-i}+1\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(c*x+I*a*c*x^2),x, algorithm="fricas")
```

```
[Out] -1/2*I*dilog((a*x + I)/(a*x - I) + 1)/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(c*x+I*a*c*x^2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.06, size = 148, normalized size = 3.02

$$\frac{\arctan(ax)\ln(ax)}{c}-\frac{\arctan(ax)\ln(ax-i)}{c}+\frac{i\ln(ax)\ln(iax+1)}{2c}-\frac{i\ln(ax)\ln(-iax+1)}{2c}+\frac{i\,\text{dilog}(iax+1)}{2c}-\frac{i\,\text{dilo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(c*x+I*a*c*x^2),x)
```

```
[Out] 1/c*arctan(a*x)*ln(a*x)-1/c*arctan(a*x)*ln(a*x-I)+1/2*I/c*ln(a*x)*ln(1+I*a*
x)-1/2*I/c*ln(a*x)*ln(1-I*a*x)+1/2*I/c*dilog(1+I*a*x)-1/2*I/c*dilog(1-I*a*x
)+1/2*I/c*ln(a*x-I)*ln(-1/2*I*(I+a*x))+1/2*I/c*dilog(-1/2*I*(I+a*x))-1/4*I/
c*ln(a*x-I)^2
```

maxima [B] time = 0.41, size = 126, normalized size = 2.57

$$\frac{1}{4}a\left(-\frac{i\log(iax+1)^2}{ac}+\frac{2i\left(\log(iax+1)\log\left(-\frac{1}{2}iax+\frac{1}{2}\right)+\text{Li}_2\left(\frac{1}{2}iax+\frac{1}{2}\right)\right)}{ac}+\frac{2i\left(\log(iax+1)\log(x)+\text{Li}_2(-i\right.}{ac}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(c*x+I*a*c*x^2),x, algorithm="maxima")
```

```
[Out] 1/4*a*(-I*log(I*a*x + 1)^2/(a*c) + 2*I*(log(I*a*x + 1)*log(-1/2*I*a*x + 1/2
) + dilog(1/2*I*a*x + 1/2))/(a*c) + 2*I*(log(I*a*x + 1)*log(x) + dilog(-I*a
*x))/(a*c) - 2*I*(log(-I*a*x + 1)*log(x) + dilog(I*a*x))/(a*c)) - (log(I*a*
x + 1)/c - log(x)/c)*arctan(a*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\operatorname{atan}(a\,x)}{1\mathrm{i}\,a\,c\,x^2+c\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c*x + a*c*x^2*1i),x)
[Out] int(atan(a*x)/(c*x + a*c*x^2*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{\operatorname{atan}(ax)}{ax^2-ix}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(c*x+I*a*c*x**2),x)
[Out] -I*Integral(atan(a*x)/(a*x**2 - I*x), x)/c
```

3.68 $\int x^3(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=287

$$-\frac{9d\left(a+b\tan^{-1}(cx)\right)^2}{20c^4}+\frac{2ibd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{5c^4}+\frac{abdx}{2c^3}+\frac{ibdx^2\left(a+b\tan^{-1}(cx)\right)}{5c^2}+\frac{1}{5}icdx^5\left(a+b\tan^{-1}(c\right.$$

```
[Out] 1/2*a*b*d*x/c^3-3/10*I*b^2*d*x/c^3+1/12*b^2*d*x^2/c^2+1/30*I*b^2*d*x^3/c+3/
10*I*b^2*d*arctan(c*x)/c^4+1/2*b^2*d*x*arctan(c*x)/c^3+1/5*I*b*d*x^2*(a+b*a
rctan(c*x))/c^2-1/6*b*d*x^3*(a+b*arctan(c*x))/c-1/10*I*b*d*x^4*(a+b*arctan(
c*x))-9/20*d*(a+b*arctan(c*x))^2/c^4+1/4*d*x^4*(a+b*arctan(c*x))^2+1/5*I*c*
d*x^5*(a+b*arctan(c*x))^2+2/5*I*b*d*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^4-1
/3*b^2*d*ln(c^2*x^2+1)/c^4-1/5*b^2*d*polylog(2,1-2/(1+I*c*x))/c^4
```

Rubi [A] time = 0.60, antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 15, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.652, Rules used = {4876, 4852, 4916, 266, 43, 4846, 260, 4884, 302, 203, 321, 4920, 4854, 2402, 2315}

$$-\frac{b^2d\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{5c^4}+\frac{ibdx^2\left(a+b\tan^{-1}(cx)\right)}{5c^2}+\frac{abdx}{2c^3}-\frac{9d\left(a+b\tan^{-1}(cx)\right)^2}{20c^4}+\frac{2ibd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}\right.}{5c^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (a*b*d*x)/(2*c^3) - (((3*I)/10)*b^2*d*x)/c^3 + (b^2*d*x^2)/(12*c^2) + ((I/3
0)*b^2*d*x^3)/c + (((3*I)/10)*b^2*d*ArcTan[c*x])/c^4 + (b^2*d*x*ArcTan[c*x]
)/(2*c^3) + ((I/5)*b*d*x^2*(a + b*ArcTan[c*x]))/c^2 - (b*d*x^3*(a + b*ArcTa
n[c*x]))/(6*c) - (I/10)*b*d*x^4*(a + b*ArcTan[c*x]) - (9*d*(a + b*ArcTan[c*
x])^2)/(20*c^4) + (d*x^4*(a + b*ArcTan[c*x])^2)/4 + (I/5)*c*d*x^5*(a + b*Ar
cTan[c*x])^2 + (((2*I)/5)*b*d*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c^4 -
 (b^2*d*Log[1 + c^2*x^2])/(3*c^4) - (b^2*d*PolyLog[2, 1 - 2/(1 + I*c*x)])/(
5*c^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x^3(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(dx^3\left(a+b\tan^{-1}(cx)\right)^2+icdx^4\left(a+b\tan^{-1}(cx)\right)^2\right)dx$$
$$=d\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx+(icd)\int x^4\left(a+b\tan^{-1}(cx)\right)^2\,dx$$
$$=\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{5}icdx^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}(bcd)\int\frac{x^4\left(a+\right.}{1}$$
$$=\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{5}icdx^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{5}(2ibd)\int x^3\left(a+\right.$$
$$=-\frac{bdx^3\left(a+b\tan^{-1}(cx)\right)}{6c}-\frac{1}{10}ibdx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}dx^4\left(a+b\tan^{-1}\right.$$
$$=\frac{abdx}{2c^3}+\frac{ibdx^2\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{bdx^3\left(a+b\tan^{-1}(cx)\right)}{6c}-\frac{1}{10}ibdx^4\left(a+\right.$$
$$=\frac{abdx}{2c^3}-\frac{3ib^2dx}{10c^3}+\frac{ib^2dx^3}{30c}+\frac{b^2dx\tan^{-1}(cx)}{2c^3}+\frac{ibdx^2\left(a+b\tan^{-1}(cx)\right)}{5c^2}-$$
$$=\frac{abdx}{2c^3}-\frac{3ib^2dx}{10c^3}+\frac{b^2dx^2}{12c^2}+\frac{ib^2dx^3}{30c}+\frac{3ib^2d\tan^{-1}(cx)}{10c^4}+\frac{b^2dx\tan^{-1}(cx)}{2c^3}+$$
$$=\frac{abdx}{2c^3}-\frac{3ib^2dx}{10c^3}+\frac{b^2dx^2}{12c^2}+\frac{ib^2dx^3}{30c}+\frac{3ib^2d\tan^{-1}(cx)}{10c^4}+\frac{b^2dx\tan^{-1}(cx)}{2c^3}+$$

Mathematica [A] time = 0.86, size = 285, normalized size = 0.99

$$\frac{d\left(12ia^2c^5x^5+15a^2c^4x^4-6iabc^4x^4-10abc^3x^3+12iabc^2x^2-12iab\log\left(c^2x^2+1\right)+2b\tan^{-1}(cx)\left(3a\left(4ic^5x^5+5c\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (d*((18*I)*a*b + 5*b^2 + 30*a*b*c*x - (18*I)*b^2*c*x + (12*I)*a*b*c^2*x^2 +
 5*b^2*c^2*x^2 - 10*a*b*c^3*x^3 + (2*I)*b^2*c^3*x^3 + 15*a^2*c^4*x^4 - (6*I
)*a*b*c^4*x^4 + (12*I)*a^2*c^5*x^5 + 3*b^2*(-1 + 5*c^4*x^4 + (4*I)*c^5*x^5)
*ArcTan[c*x]^2 + 2*b*ArcTan[c*x]*(b*(9*I + 15*c*x + (6*I)*c^2*x^2 - 5*c^3*x
^3 - (3*I)*c^4*x^4) + 3*a*(-5 + 5*c^4*x^4 + (4*I)*c^5*x^5) + (12*I)*b*Log[1
 + E^((2*I)*ArcTan[c*x])]) - (12*I)*a*b*Log[1 + c^2*x^2] - 20*b^2*Log[1 + c
^2*x^2] + 12*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/(60*c^4)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\frac{1}{80}\left(-4i\,b^2cdx^5 - 5\,b^2dx^4\right)\log\left(-\frac{cx+i}{cx-i}\right)^2 + \text{integral}\left(\frac{20i\,a^2c^3dx^6 + 20\,a^2c^2dx^5 + 20i\,a^2cdx^4 + 20\,a^2dx^3 - (20\,a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/80*(-4*I*b^2*c*d*x^5 - 5*b^2*d*x^4)*log(-(c*x + I)/(c*x - I))^2 + integra
l(1/20*(20*I*a^2*c^3*d*x^6 + 20*a^2*c^2*d*x^5 + 20*I*a^2*c*d*x^4 + 20*a^2*d
*x^3 - (20*a*b*c^3*d*x^6 + 4*(-5*I*a*b - b^2)*c^2*d*x^5 + (20*a*b + 5*I*b^2
)*c*d*x^4 - 20*I*a*b*d*x^3)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.10, size = 499, normalized size = 1.74

$$\frac{2icdab\arctan(cx)\,x^5}{5} + \frac{d\,a^2x^4}{4} + \frac{dab\arctan(cx)\,x^4}{2} - \frac{d\,b^2\arctan(cx)\,x^3}{6c} - \frac{dab\arctan(cx)}{2c^4} - \frac{3ib^2dx}{10c^3} - \frac{d\,b^2\ln(cx+}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/4*d*a^2*x^4+2/5*I*c*d*a*b*arctan(c*x)*x^5+1/5*I/c^2*d*a*b*x^2+1/5*I/c^2*d
*b^2*arctan(c*x)*x^2+1/5*I*c*d*b^2*arctan(c*x)^2*x^5-1/5*I/c^4*d*b^2*arctan
(c*x)*ln(c^2*x^2+1)+1/10/c^4*d*b^2*ln(c*x-I)*ln(c^2*x^2+1)-1/10/c^4*d*b^2*l
n(c*x-I)*ln(-1/2*I*(I+c*x))+1/2*d*a*b*arctan(c*x)*x^4+1/5*I*c*d*a^2*x^5-1/6
/c*d*b^2*arctan(c*x)*x^3-1/10*I*d*b^2*arctan(c*x)*x^4+1/10/c^4*d*b^2*ln(I+c
*x)*ln(1/2*I*(c*x-I))-1/2/c^4*d*a*b*arctan(c*x)+1/30*I*b^2*d*x^3/c+3/10*I*b
^2*d*arctan(c*x)/c^4+1/2*a*b*d*x/c^3+1/2*b^2*d*x*arctan(c*x)/c^3-3/10*I*b^2
*d*x/c^3+1/12*b^2*d*x^2/c^2-1/3*b^2*d*ln(c^2*x^2+1)/c^4-1/5*I/c^4*d*a*b*ln(
c^2*x^2+1)-1/10/c^4*d*b^2*ln(I+c*x)*ln(c^2*x^2+1)-1/6/c*d*a*b*x^3-1/10*I*d*
a*b*x^4+1/4*d*b^2*arctan(c*x)^2*x^4+1/10/c^4*d*b^2*dilog(1/2*I*(c*x-I))-1/1
0/c^4*d*b^2*dilog(-1/2*I*(I+c*x))+1/20/c^4*d*b^2*ln(I+c*x)^2-1/4/c^4*d*b^2*
arctan(c*x)^2-1/20/c^4*d*b^2*ln(c*x-I)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{5}i\,a^2cdx^5 + \frac{1}{4}\,b^2dx^4\arctan(cx)^2 + \frac{1}{4}\,a^2dx^4 + \frac{1}{10}i\left(4\,x^5\arctan(cx) - c\left(\frac{c^2x^4 - 2\,x^2}{c^4} + \frac{2\,\log\left(c^2x^2+1\right)}{c^6}\right)\right)abcd + \frac{1}{80}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*I*a^2*c*d*x^5 + 1/4*b^2*d*x^4*arctan(c*x)^2 + 1/4*a^2*d*x^4 + 1/10*I*(4
*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*a*b*
c*d + 1/80*I*(4*x^5*arctan(c*x)^2 - x^5*log(c^2*x^2 + 1)^2 + 80*integrate(1
/80*(4*c^2*x^6*log(c^2*x^2 + 1) - 8*c*x^5*arctan(c*x) + 60*(c^2*x^6 + x^4)*
arctan(c*x)^2 + 5*(c^2*x^6 + x^4)*log(c^2*x^2 + 1)^2)/(c^2*x^2 + 1), x))*b^
```

```
2*c*d + 1/6*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5
))*a*b*d - 1/12*(2*c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)*arctan(c*x)
- (c^2*x^2 + 3*arctan(c*x)^2 - 4*log(c^2*x^2 + 1))/c^4)*b^2*d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 (a + b \operatorname{atan}(c x))^2 (d + c d x 1i) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))^2*(d + c*d*x*1i),x)
```

```
[Out] int(x^3*(a + b*atan(c*x))^2*(d + c*d*x*1i), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+I*c*d*x)*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.69 $\int x^2(d + icdx)\left(a + b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=255

$$-\frac{7id\left(a+b\tan^{-1}(cx)\right)^2}{12c^3}-\frac{2bd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^3}+\frac{iabdx}{2c^2}+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{3}dx^3\left(a+b\tan\right.$$

```
[Out] 1/2*I*a*b*d*x/c^2+1/3*b^2*d*x/c^2+1/12*I*b^2*d*x^2/c-1/3*b^2*d*arctan(c*x)/
c^3+1/2*I*b^2*d*x*arctan(c*x)/c^2-1/3*b*d*x^2*(a+b*arctan(c*x))/c-1/6*I*b*d
*x^3*(a+b*arctan(c*x))-7/12*I*d*(a+b*arctan(c*x))^2/c^3+1/3*d*x^3*(a+b*arct
an(c*x))^2+1/4*I*c*d*x^4*(a+b*arctan(c*x))^2-2/3*b*d*(a+b*arctan(c*x))*ln(2
/(1+I*c*x))/c^3-1/3*I*b^2*d*ln(c^2*x^2+1)/c^3-1/3*I*b^2*d*polylog(2,1-2/(1+
I*c*x))/c^3
```

Rubi [A] time = 0.49, antiderivative size = 255, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 14, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.609, Rules used = {4876, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 266, 43, 4846, 260, 4884}

$$-\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^3}+\frac{iabdx}{2c^2}-\frac{7id\left(a+b\tan^{-1}(cx)\right)^2}{12c^3}-\frac{2bd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^3}+\frac{1}{4}icdx^4\left(a+b\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] ((I/2)*a*b*d*x)/c^2 + (b^2*d*x)/(3*c^2) + ((I/12)*b^2*d*x^2)/c - (b^2*d*Arc
Tan[c*x])/(3*c^3) + ((I/2)*b^2*d*x*ArcTan[c*x])/c^2 - (b*d*x^2*(a + b*ArcTa
n[c*x]))/(3*c) - (I/6)*b*d*x^3*(a + b*ArcTan[c*x]) - (((7*I)/12)*d*(a + b*A
rcTan[c*x])^2)/c^3 + (d*x^3*(a + b*ArcTan[c*x])^2)/3 + (I/4)*c*d*x^4*(a + b
*ArcTan[c*x])^2 - (2*b*d*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(3*c^3) -
((I/3)*b^2*d*Log[1 + c^2*x^2])/c^3 - ((I/3)*b^2*d*PolyLog[2, 1 - 2/(1 + I*c
*x)])/c^3
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x^2(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2\,dx = \int\left(dx^2\left(a+b\tan^{-1}(cx)\right)^2+icdx^3\left(a+b\tan^{-1}(cx)\right)^2\right)dx$$

$$= d\int x^2\left(a+b\tan^{-1}(cx)\right)^2\,dx+(icd)\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx$$

$$= \frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{3}(2bcd)\int\frac{x^3(}{}$$

$$= \frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{4}icdx^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}(ibd)\int x^2(a$$

$$= -\frac{bdx^2\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{1}{6}ibdx^3\left(a+b\tan^{-1}(cx)\right)-\frac{id\left(a+b\tan^{-1}(\right.}{3c^3}$$

$$= \frac{iabdx}{2c^2}+\frac{b^2dx}{3c^2}-\frac{bdx^2\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{1}{6}ibdx^3\left(a+b\tan^{-1}(cx)\right)-$$

$$= \frac{iabdx}{2c^2}+\frac{b^2dx}{3c^2}-\frac{b^2d\tan^{-1}(cx)}{3c^3}+\frac{ib^2dx\tan^{-1}(cx)}{2c^2}-\frac{bdx^2\left(a+b\tan^{-1}(\right.}{3c}$$

$$= \frac{iabdx}{2c^2}+\frac{b^2dx}{3c^2}+\frac{ib^2dx^2}{12c}-\frac{b^2d\tan^{-1}(cx)}{3c^3}+\frac{ib^2dx\tan^{-1}(cx)}{2c^2}-\frac{bdx^2(a}{}$$

Mathematica [A] time = 0.64, size = 241, normalized size = 0.95

$$\frac{id\left(3a^2c^4x^4-4ia^2c^3x^3-2abc^3x^3+4iabc^2x^2-4iab\log\left(c^2x^2+1\right)+2b\tan^{-1}(cx)\left(a\left(3c^4x^4-4ic^3x^3-3\right)+b\left(\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] ((I/12)*d*(b^2 + 6*a*b*c*x - (4*I)*b^2*c*x + (4*I)*a*b*c^2*x^2 + b^2*c^2*x^
2 - (4*I)*a^2*c^3*x^3 - 2*a*b*c^3*x^3 + 3*a^2*c^4*x^4 + b^2*(1 - (4*I)*c^3*
x^3 + 3*c^4*x^4)*ArcTan[c*x]^2 + 2*b*ArcTan[c*x]*(b*(2*I + 3*c*x + (2*I)*c^
2*x^2 - c^3*x^3) + a*(-3 - (4*I)*c^3*x^3 + 3*c^4*x^4) + (4*I)*b*Log[1 + E^(
(2*I)*ArcTan[c*x])]) - (4*I)*a*b*Log[1 + c^2*x^2] - 4*b^2*Log[1 + c^2*x^2]
+ 4*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/c^3
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{1}{48}\left(-3i\,b^2cdx^4-4\,b^2dx^3\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(\frac{12i\,a^2c^3dx^5+12\,a^2c^2dx^4+12i\,a^2cdx^3+12\,a^2dx^2-\left(12\,a\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/48*(-3*I*b^2*c*d*x^4 - 4*b^2*d*x^3)*log(-(c*x + I)/(c*x - I))^2 + integra
l(1/12*(12*I*a^2*c^3*d*x^5 + 12*a^2*c^2*d*x^4 + 12*I*a^2*c*d*x^3 + 12*a^2*d
```

```
*x^2 - (12*a*b*c^3*d*x^5 + 3*(-4*I*a*b - b^2)*c^2*d*x^4 + (12*a*b + 4*I*b^2
)*c*d*x^3 - 12*I*a*b*d*x^2)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 467, normalized size = 1.83

$$\frac{d\,a^2x^3}{3}+\frac{icdab\arctan(cx)\,x^4}{2}+\frac{id\,b^2\ln(cx+i)\ln\left(\frac{i(cx-i)}{2}\right)}{6c^3}+\frac{ib^2dx\arctan(cx)}{2c^2}-\frac{idab\arctan(cx)}{2c^3}-\frac{id\,b^2\ln(cx-i)\ln}{6c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/3*d*a^2*x^3+1/6*I/c^3*d*b^2*ln(c*x-I)*ln(c^2*x^2+1)-1/3*I*b^2*d*ln(c^2*x^
2+1)/c^3-1/6*I/c^3*d*b^2*ln(I+c*x)*ln(c^2*x^2+1)+1/4*I*c*d*b^2*arctan(c*x)^
2*x^4+1/6*I/c^3*d*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))+1/2*I*a*b*d*x/c^2+1/3*b^2
*d*x/c^2-1/3*b^2*d*arctan(c*x)/c^3-1/6*I*d*b^2*arctan(c*x)*x^3+1/4*I*c*d*a^
2*x^4-1/3/c*d*b^2*arctan(c*x)*x^2+1/3/c^3*d*b^2*arctan(c*x)*ln(c^2*x^2+1)+1
/3/c^3*d*a*b*ln(c^2*x^2+1)+2/3*d*a*b*arctan(c*x)*x^3-1/3/c*d*a*b*x^2-1/6*I*
d*a*b*x^3-1/4*I/c^3*d*b^2*arctan(c*x)^2-1/12*I/c^3*d*b^2*ln(c*x-I)^2+1/6*I/
c^3*d*b^2*dilog(1/2*I*(c*x-I))+1/12*I/c^3*d*b^2*ln(I+c*x)^2+1/3*d*b^2*arcta
n(c*x)^2*x^3+1/12*I*b^2*d*x^2/c+1/2*I*b^2*d*x*arctan(c*x)/c^2-1/6*I/c^3*d*b
^2*dilog(-1/2*I*(I+c*x))-1/2*I/c^3*d*a*b*arctan(c*x)-1/6*I/c^3*d*b^2*ln(c*x
-I)*ln(-1/2*I*(I+c*x))+1/2*I*c*d*a*b*arctan(c*x)*x^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}i\,a^2cdx^4+\frac{1}{3}\,a^2dx^3+\frac{1}{6}i\left(3\,x^4\arctan(cx)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3\arctan(cx)}{c^5}\right)\right)abcd+\frac{1}{3}\left(2\,x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/4*I*a^2*c*d*x^4 + 1/3*a^2*d*x^3 + 1/6*I*(3*x^4*arctan(c*x) - c*((c^2*x^3
- 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*b*c*d + 1/3*(2*x^3*arctan(c*x) - c*(x^2/
c^2 - log(c^2*x^2 + 1)/c^4))*a*b*d + 1/192*(12*I*b^2*c*d*x^4 + 16*b^2*d*x^3
)*arctan(c*x)^2 - 1/48*(3*b^2*c*d*x^4 - 4*I*b^2*d*x^3)*arctan(c*x)*log(c^2*
x^2 + 1) + 1/192*(-3*I*b^2*c*d*x^4 - 4*b^2*d*x^3)*log(c^2*x^2 + 1)^2 + I*in
tegrate(-1/48*(14*b^2*c^2*d*x^4*arctan(c*x) - 36*(b^2*c^3*d*x^5 + b^2*c*d*x
^3)*arctan(c*x)^2 - 3*(b^2*c^3*d*x^5 + b^2*c*d*x^3)*log(c^2*x^2 + 1)^2 - (3
*b^2*c^3*d*x^5 - 4*b^2*c*d*x^3 - 12*(b^2*c^2*d*x^4 + b^2*d*x^2)*arctan(c*x)
)*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x) + integrate(1/48*(36*(b^2*c^2*d*x^4 +
 b^2*d*x^2)*arctan(c*x)^2 + 3*(b^2*c^2*d*x^4 + b^2*d*x^2)*log(c^2*x^2 + 1)^
2 + 2*(3*b^2*c^3*d*x^5 - 4*b^2*c*d*x^3)*arctan(c*x) + (7*b^2*c^2*d*x^4 + 12
*(b^2*c^3*d*x^5 + b^2*c*d*x^3)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1)
, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2\,\left(d+c\,d\,x\,1\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))^2*(d + c*d*x*1i),x)
```

```
[Out] int(x^2*(a + b*atan(c*x))^2*(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+I*c*d*x)*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.70 $\int x(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=211

$$\frac{5d\left(a+b\tan^{-1}(cx)\right)^2}{6c^2}-\frac{2ibd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^2}+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{3}i$$

```
[Out] -a*b*d*x/c+1/3*I*b^2*d*x/c-1/3*I*b^2*d*arctan(c*x)/c^2-b^2*d*x*arctan(c*x)/
c-1/3*I*b*d*x^2*(a+b*arctan(c*x))+5/6*d*(a+b*arctan(c*x))^2/c^2+1/2*d*x^2*(
a+b*arctan(c*x))^2+1/3*I*c*d*x^3*(a+b*arctan(c*x))^2-2/3*I*b*d*(a+b*arctan(
c*x))*ln(2/(1+I*c*x))/c^2+1/2*b^2*d*ln(c^2*x^2+1)/c^2+1/3*b^2*d*polylog(2,1
-2/(1+I*c*x))/c^2
```

Rubi [A] time = 0.36, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4876, 4852, 4916, 4846, 260, 4884, 321, 203, 4920, 4854, 2402, 2315}

$$\frac{b^2d\,\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^2}+\frac{5d\left(a+b\tan^{-1}(cx)\right)^2}{6c^2}-\frac{2ibd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^2}+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)^2+$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] -((a*b*d*x)/c) + ((I/3)*b^2*d*x)/c - ((I/3)*b^2*d*ArcTan[c*x])/c^2 - (b^2*d
*x*ArcTan[c*x])/c - (I/3)*b*d*x^2*(a + b*ArcTan[c*x]) + (5*d*(a + b*ArcTan[
c*x])^2)/(6*c^2) + (d*x^2*(a + b*ArcTan[c*x])^2)/2 + (I/3)*c*d*x^3*(a + b*A
rcTan[c*x])^2 - (((2*I)/3)*b*d*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c^2
+ (b^2*d*Log[1 + c^2*x^2])/(2*c^2) + (b^2*d*PolyLog[2, 1 - 2/(1 + I*c*x)])/
(3*c^2)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
```

```
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2\,dx = \int\left(dx\left(a+b\tan^{-1}(cx)\right)^2+icdx^2\left(a+b\tan^{-1}(cx)\right)^2\right)dx$$
$$= d\int x\left(a+b\tan^{-1}(cx)\right)^2\,dx+(icd)\int x^2\left(a+b\tan^{-1}(cx)\right)^2\,dx$$
$$= \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)^2-(bcd)\int\frac{x^2\left(a+b\,\mathrm{ta}\right.}{1+c}$$
$$= \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{3}icdx^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{3}(2ibd)\int x\left(a+b\right.$$
$$= -\frac{abdx}{c}-\frac{1}{3}ibdx^2\left(a+b\tan^{-1}(cx)\right)+\frac{5d\left(a+b\tan^{-1}(cx)\right)^2}{6c^2}+\frac{1}{2}dx^2\left(a+b\,\mathrm{t}\right.$$
$$= -\frac{abdx}{c}+\frac{ib^2dx}{3c}-\frac{b^2dx\tan^{-1}(cx)}{c}-\frac{1}{3}ibdx^2\left(a+b\tan^{-1}(cx)\right)+\frac{5d\left(a+b\,\mathrm{t}\right.}{6}$$
$$= -\frac{abdx}{c}+\frac{ib^2dx}{3c}-\frac{ib^2d\tan^{-1}(cx)}{3c^2}-\frac{b^2dx\tan^{-1}(cx)}{c}-\frac{1}{3}ibdx^2\left(a+b\tan^{-1}(\right.$$
$$= -\frac{abdx}{c}+\frac{ib^2dx}{3c}-\frac{ib^2d\tan^{-1}(cx)}{3c^2}-\frac{b^2dx\tan^{-1}(cx)}{c}-\frac{1}{3}ibdx^2\left(a+b\tan^{-1}(\right.$$

Mathematica [A] time = 0.54, size = 208, normalized size = 0.99

$$\frac{d\left(2ia^2c^3x^3+3a^2c^2x^2-2iabc^2x^2+2iab\log\left(c^2x^2+1\right)+2b\tan^{-1}(cx)\left(a\left(2ic^3x^3+3c^2x^2+3\right)-ib\left(c^2x^2-3icx+\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (d*(-6*a*b*c*x + (2*I)*b^2*c*x + 3*a^2*c^2*x^2 - (2*I)*a*b*c^2*x^2 + (2*I)*
a^2*c^3*x^3 + b^2*(1 + 3*c^2*x^2 + (2*I)*c^3*x^3)*ArcTan[c*x]^2 + 2*b*ArcTa
n[c*x]*((-I)*b*(1 - (3*I)*c*x + c^2*x^2) + a*(3 + 3*c^2*x^2 + (2*I)*c^3*x^3
) - (2*I)*b*Log[1 + E^((2*I)*ArcTan[c*x])]) + (2*I)*a*b*Log[1 + c^2*x^2] +
3*b^2*Log[1 + c^2*x^2] - 2*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/(6*c^2)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\frac{1}{24}\left(-2i\,b^2cdx^3-3\,b^2dx^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\mathrm{integral}\left(\frac{6i\,a^2c^3dx^4+6\,a^2c^2dx^3+6i\,a^2cdx^2+6\,a^2dx-\left(6\,abc^3dx^4+2\right.}{6\left(c^2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/24*(-2*I*b^2*c*d*x^3 - 3*b^2*d*x^2)*log(-(c*x + I)/(c*x - I))^2 + integra
l(1/6*(6*I*a^2*c^3*d*x^4 + 6*a^2*c^2*d*x^3 + 6*I*a^2*c*d*x^2 + 6*a^2*d*x -
(6*a*b*c^3*d*x^4 + 2*(-3*I*a*b - b^2)*c^2*d*x^3 + (6*a*b + 3*I*b^2)*c*d*x^2
 - 6*I*a*b*d*x)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

[Out] sage0*x

maple [B] time = 0.11, size = 416, normalized size = 1.97

$$-\frac{abdx}{c}-\frac{b^2dx\arctan(cx)}{c}+\frac{b^2d\ln\left(c^2x^2+1\right)}{2c^2}+\frac{idb^2\ln\left(c^2x^2+1\right)\arctan(cx)}{3c^2}+\frac{idab\ln\left(c^2x^2+1\right)}{3c^2}+\frac{icdb^2\arctan}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x)

[Out] -a*b*d*x/c+1/3*I*b^2*d*x/c-b^2*d*x*arctan(c*x)/c+1/2*b^2*d*ln(c^2*x^2+1)/c^2-1/3*I*b^2*d*arctan(c*x)/c^2+1/3*I*c*d*b^2*arctan(c*x)^2*x^3+1/3*I/c^2*d*b^2*ln(c^2*x^2+1)*arctan(c*x)+1/3*I/c^2*d*a*b*ln(c^2*x^2+1)-1/3*I*d*a*b*x^2+1/6/c^2*d*b^2*ln(I+c*x)*ln(c^2*x^2+1)-1/6/c^2*d*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))+1/c^2*d*a*b*arctan(c*x)+d*a*b*arctan(c*x)*x^2-1/6/c^2*d*b^2*ln(c*x-I)*ln(c^2*x^2+1)+1/6/c^2*d*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/2*d*b^2*arctan(c*x)^2*x^2-1/6/c^2*d*b^2*dilog(1/2*I*(c*x-I))-1/12/c^2*d*b^2*ln(I+c*x)^2+1/2/c^2*d*b^2*arctan(c*x)^2+1/12/c^2*d*b^2*ln(c*x-I)^2+1/6/c^2*d*b^2*dilog(-1/2*I*(I+c*x))+1/3*I*c*d*a^2*x^3+1/2*d*a^2*x^2-1/3*I*d*b^2*arctan(c*x)*x^2+2/3*I*c*d*a*b*arctan(c*x)*x^3

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}ia^2cdx^3+\frac{1}{2}b^2dx^2\arctan(cx)^2+\frac{1}{3}i\left(2x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)abcd+\frac{1}{48}i\left(4x^3\arctan(cx)^2-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="maxima")

[Out] 1/3*I*a^2*c*d*x^3 + 1/2*b^2*d*x^2*arctan(c*x)^2 + 1/3*I*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a*b*c*d + 1/48*I*(4*x^3*arctan(c*x)^2 - x^3*log(c^2*x^2 + 1)^2 + 48*integrate(1/48*(4*c^2*x^4*log(c^2*x^2 + 1) - 8*c*x^3*arctan(c*x) + 36*(c^2*x^4 + x^2)*arctan(c*x)^2 + 3*(c^2*x^4 + x^2)*log(c^2*x^2 + 1)^2)/(c^2*x^2 + 1), x))*b^2*c*d + 1/2*a^2*d*x^2 + (x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a*b*d - 1/2*(2*c*(x/c^2 - arctan(c*x)/c^3)*arctan(c*x) + (arctan(c*x)^2 - log(c^2*x^2 + 1))/c^2)*b^2*d

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{atan}(c\,x))^2\,\left(d+c\,d\,x\,1\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a + b*atan(c*x))^2*(d + c*d*x*1i),x)

[Out] int(x*(a + b*atan(c*x))^2*(d + c*d*x*1i), x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(d+I*c*d*x)*(a+b*atan(c*x))**2,x)

[Out] Timed out

3.71 $\int (d+icdx)\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=130

$$-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{2bd\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}-iabdx+\frac{ib^2d\log\left(c^2x^2+1\right)}{2c}-\frac{ib^2d\text{Li}_2\left(1-\frac{2}{1-icx}\right)}{c}$$

[Out] -I*a*b*d*x-I*b^2*d*x*arctan(c*x)-1/2*I*d*(1+I*c*x)^2*(a+b*arctan(c*x))^2/c+2*b*d*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/c+1/2*I*b^2*d*ln(c^2*x^2+1)/c-I*b^2*d*polylog(2,1-2/(1-I*c*x))/c

Rubi [A] time = 0.12, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.350$, Rules used = {4864, 4846, 260, 1586, 4854, 2402, 2315}

$$-\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{c}-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{2bd\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}-iabdx+\frac{ib^2d\log\left(c^2x^2+1\right)}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (-I)*a*b*d*x - I*b^2*d*x*ArcTan[c*x] - ((I/2)*d*(1 + I*c*x)^2*(a + b*ArcTan[c*x])^2)/c + (2*b*d*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/c + ((I/2)*b^2*d*Log[1 + c^2*x^2])/c - (I*b^2*d*PolyLog[2, 1 - 2/(1 - I*c*x)])/c
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveContent[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] :> Int[u*PolynomialQuotient[Px, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] && EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 - c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dist[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*ArcTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
```

```
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rubi steps

$$\int (d+icdx)\left(a+b\tan^{-1}(cx)\right)^2\,dx = -\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{(ib)\int\left(-d^2\left(a+b\tan^{-1}(cx)\right)-\frac{2i\left(id^2-c\right.}{}\right.}{d}$$

$$= -\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{(2b)\int\frac{\left(id^2-cd^2x\right)\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}\,dx}{d}-(ibd)$$

$$= -iabdx-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{(2b)\int\frac{a+b\tan^{-1}(cx)}{-\frac{i}{d^2}-\frac{cx}{d^2}}\,dx}{d}-\left(ib^2d\right)$$

$$= -iabdx-ib^2dx\tan^{-1}(cx)-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{2bd\left(a+b\,\mathrm{t}\right.}{}$$

$$= -iabdx-ib^2dx\tan^{-1}(cx)-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{2bd\left(a+b\,\mathrm{t}\right.}{}$$

$$= -iabdx-ib^2dx\tan^{-1}(cx)-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^2}{2c}+\frac{2bd\left(a+b\,\mathrm{t}\right.}{}$$

Mathematica [A] time = 0.27, size = 151, normalized size = 1.16

$$\frac{id\left(a^2c^2x^2-2ia^2cx+2iab\log\left(c^2x^2+1\right)+2b\tan^{-1}(cx)\left(ac^2x^2-2iacx+a-bcx-2ib\log\left(1+e^{2i\tan^{-1}(cx)}\right)\right)-\right.}{2c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + I*c*d*x)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] ((I/2)*d*((-2*I)*a^2*c*x - 2*a*b*c*x + a^2*c^2*x^2 + b^2*(-I + c*x)^2*ArcTa
n[c*x]^2 + 2*b*ArcTan[c*x]*(a - (2*I)*a*c*x - b*c*x + a*c^2*x^2 - (2*I)*b*L
og[1 + E^((2*I)*ArcTan[c*x])]) + (2*I)*a*b*Log[1 + c^2*x^2] + b^2*Log[1 + c
^2*x^2] - 2*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/c
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\frac{1}{8}\left(-i\,b^2cdx^2-2\,b^2dx\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\mathrm{integral}\left(\frac{2i\,a^2c^3dx^3+2\,a^2c^2dx^2+2i\,a^2cdx+2\,a^2d-\left(2\,abc^3dx^3-\left(2i\right.\right.}{2\left(c^2x^2+\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/8*(-I*b^2*c*d*x^2 - 2*b^2*d*x)*log(-(c*x + I)/(c*x - I))^2 + integral(1/2
*(2*I*a^2*c^3*d*x^3 + 2*a^2*c^2*d*x^2 + 2*I*a^2*c*d*x + 2*a^2*d - (2*a*b*c^
```

```
3*d*x^3 - (2*I*a*b + b^2)*c^2*d*x^2 + (2*a*b + 2*I*b^2)*c*d*x - 2*I*a*b*d)*
log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 367, normalized size = 2.82

$$a^2dx - \frac{id\,b^2\ln(cx+i)^2}{4c} + d\,b^2\arctan(cx)^2\,x + \frac{id\,b^2\ln(cx-i)\ln\left(-\frac{i(cx+i)}{2}\right)}{2c} + \frac{icd\,a^2x^2}{2} - \frac{id\,b^2\ln(cx+i)\ln\left(\frac{i(cx-i)}{2}\right)}{2c} - \frac{d\,i}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))^2,x)
```

```
[Out] a^2*d*x-1/4*I/c*d*b^2*ln(I+c*x)^2+d*b^2*arctan(c*x)^2*x+1/2*I/c*d*b^2*ln(c*
x-I)*ln(-1/2*I*(I+c*x))+1/2*I/c*d*b^2*dilog(-1/2*I*(I+c*x))+1/2*I*c*d*a^2*x
^2-1/c*d*b^2*arctan(c*x)*ln(c^2*x^2+1)-1/2*I/c*d*b^2*ln(I+c*x)*ln(1/2*I*(c*
x-I))+1/2*I/c*d*b^2*ln(I+c*x)*ln(c^2*x^2+1)-I*a*b*d*x+1/2*I/c*d*b^2*arctan(
c*x)^2-I*b^2*d*x*arctan(c*x)+1/4*I/c*d*b^2*ln(c*x-I)^2-1/2*I/c*d*b^2*ln(c*x
-I)*ln(c^2*x^2+1)+1/2*I*b^2*d*ln(c^2*x^2+1)/c+1/2*I*c*d*b^2*arctan(c*x)^2*x
^2+I*c*d*a*b*arctan(c*x)*x^2+I/c*d*a*b*arctan(c*x)+2*d*a*b*arctan(c*x)*x-1/
2*I/c*d*b^2*dilog(1/2*I*(c*x-I))-1/c*d*a*b*ln(c^2*x^2+1)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$4\,b^2c^3d\int\frac{x^3\arctan(cx)\log\left(c^2x^2+1\right)}{16\left(c^2x^2+1\right)}\,dx + 4\,b^2c^3d\int\frac{x^3\arctan(cx)}{16\left(c^2x^2+1\right)}\,dx + \frac{1}{2}i\,a^2cdx^2 + 12\,b^2c^2d\int\frac{x^2\arctan(cx)^2}{16\left(c^2x^2+1\right)}\,d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 4*b^2*c^3*d*integrate(1/16*x^3*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1),
x) + 4*b^2*c^3*d*integrate(1/16*x^3*arctan(c*x)/(c^2*x^2 + 1), x) + 1/2*I*a
^2*c*d*x^2 + 12*b^2*c^2*d*integrate(1/16*x^2*arctan(c*x)^2/(c^2*x^2 + 1), x
) + b^2*c^2*d*integrate(1/16*x^2*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + 6*b
^2*c^2*d*integrate(1/16*x^2*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + I*(x^2*arc
tan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a*b*c*d + 1/4*b^2*d*arctan(c*x)^3/c
 + 4*b^2*c*d*integrate(1/16*x*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x
) - 8*b^2*c*d*integrate(1/16*x*arctan(c*x)/(c^2*x^2 + 1), x) + a^2*d*x + b^
2*d*integrate(1/16*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + (2*c*x*arctan(c*x
) - log(c^2*x^2 + 1))*a*b*d/c + 1/32*(4*I*b^2*c*d*x^2 + 8*b^2*d*x)*arctan(c
*x)^2 - 1/8*(b^2*c*d*x^2 - 2*I*b^2*d*x)*arctan(c*x)*log(c^2*x^2 + 1) + 1/32
*(-I*b^2*c*d*x^2 - 2*b^2*d*x)*log(c^2*x^2 + 1)^2 + I*integrate(-1/16*(12*b^
2*c^2*d*x^2*arctan(c*x) - 12*(b^2*c^3*d*x^3 + b^2*c*d*x)*arctan(c*x)^2 - (b
^2*c^3*d*x^3 + b^2*c*d*x)*log(c^2*x^2 + 1)^2 - 2*(b^2*c^3*d*x^3 - 2*b^2*c*d
*x - 2*(b^2*c^2*d*x^2 + b^2*d)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1)
, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\,\mathrm{atan}(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2*(d + c*d*x*1i),x)
```

```
[Out] int((a + b*atan(c*x))^2*(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.72 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx$

Optimal. Leaf size=216

$$-ibd\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)+ibd\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)-d\left(a+b\tan^{-1}(cx)\right)^2+icdx\left(a+b\text{t}\right.$$

```
[Out] -d*(a+b*arctan(c*x))^2+I*c*d*x*(a+b*arctan(c*x))^2-2*d*(a+b*arctan(c*x))^2*
arctanh(-1+2/(1+I*c*x))+2*I*b*d*(a+b*arctan(c*x))*ln(2/(1+I*c*x))-b^2*d*pol
ylog(2,1-2/(1+I*c*x))-I*b*d*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))+I*b*
d*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))-1/2*b^2*d*polylog(3,1-2/(1+I*
c*x))+1/2*b^2*d*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.42, antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4850, 4988, 4884, 4994, 6610}

$$-ibd\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+ibd\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+b^2(-d)\text{PolyLog}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] -(d*(a + b*ArcTan[c*x])^2) + I*c*d*x*(a + b*ArcTan[c*x])^2 + 2*d*(a + b*Arc
Tan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + (2*I)*b*d*(a + b*ArcTan[c*x])*Log[
2/(1 + I*c*x)] - b^2*d*PolyLog[2, 1 - 2/(1 + I*c*x)] - I*b*d*(a + b*ArcTan[
c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] + I*b*d*(a + b*ArcTan[c*x])*PolyLog[2,
-1 + 2/(1 + I*c*x)] - (b^2*d*PolyLog[3, 1 - 2/(1 + I*c*x)])/2 + (b^2*d*Poly
Log[3, -1 + 2/(1 + I*c*x)])/2
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
```

```
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx = \int \left(icd\left(a+b\tan^{-1}(cx)\right)^2 + \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x}\right)dx$$

$$= d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx + (icd)\int \left(a+b\tan^{-1}(cx)\right)^2 dx$$

$$= icdx\left(a+b\tan^{-1}(cx)\right)^2 + 2d\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right) - (4bcd$$

$$= -d\left(a+b\tan^{-1}(cx)\right)^2 + icdx\left(a+b\tan^{-1}(cx)\right)^2 + 2d\left(a+b\tan^{-1}(cx)\right)^2\tanh$$

$$= -d\left(a+b\tan^{-1}(cx)\right)^2 + icdx\left(a+b\tan^{-1}(cx)\right)^2 + 2d\left(a+b\tan^{-1}(cx)\right)^2\tanh$$

$$= -d\left(a+b\tan^{-1}(cx)\right)^2 + icdx\left(a+b\tan^{-1}(cx)\right)^2 + 2d\left(a+b\tan^{-1}(cx)\right)^2\tanh$$

$$= -d\left(a+b\tan^{-1}(cx)\right)^2 + icdx\left(a+b\tan^{-1}(cx)\right)^2 + 2d\left(a+b\tan^{-1}(cx)\right)^2\tanh$$

Mathematica [A] time = 0.48, size = 272, normalized size = 1.26

$$d\left(ia^2cx + a^2\log(cx) + iab\left(2cx\tan^{-1}(cx) - \log\left(c^2x^2+1\right)\right) + iab(\mathrm{Li}_2(-icx) - \mathrm{Li}_2(icx)) + b^2\left(\mathrm{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right) +\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] d*(I*a^2*c*x + a^2*Log[c*x] + I*a*b*(2*c*x*ArcTan[c*x] - Log[1 + c^2*x^2])
+ b^2*(ArcTan[c*x]*((1 + I*c*x)*ArcTan[c*x] + (2*I)*Log[1 + E^((2*I)*ArcTan
[c*x])]) + PolyLog[2, -E^((2*I)*ArcTan[c*x])]) + I*a*b*(PolyLog[2, (-I)*c*x
] - PolyLog[2, I*c*x]) + b^2*((-1/24*I)*Pi^3 + ((2*I)/3)*ArcTan[c*x]^3 + Ar
cTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - ArcTan[c*x]^2*Log[1 + E^((2*I
)*ArcTan[c*x])] + I*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + I*ArcT
an[c*x]*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + PolyLog[3, E^((-2*I)*ArcTan[c*
x])]/2 - PolyLog[3, -E^((2*I)*ArcTan[c*x])]/2))
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{4i\,a^2cdx + 4\,a^2d + \left(-i\,b^2cdx - b^2d\right)\log\left(-\frac{cx+i}{cx-i}\right)^2 - (4\,abcdx - 4i\,abd)\log\left(-\frac{cx+i}{cx-i}\right)}{4\,x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(1/4*(4*I*a^2*c*d*x + 4*a^2*d + (-I*b^2*c*d*x - b^2*d)*log(-(c*x +
I)/(c*x - I))^2 - (4*a*b*c*d*x - 4*I*a*b*d)*log(-(c*x + I)/(c*x - I)))/x, x
)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.79, size = 7034, normalized size = 32.56

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))^2/x,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}i\,b^2cdx\arctan(cx)^2+12i\,b^2c^3d\int\frac{x^3\arctan(cx)^2}{16\left(c^2x^3+x\right)}\,dx+4\,b^2c^3d\int\frac{x^3\arctan(cx)\log\left(c^2x^2+1\right)}{16\left(c^2x^3+x\right)}\,dx+i\,b^2c^3d\int$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] 1/4*I*b^2*c*d*x*arctan(c*x)^2 + 12*I*b^2*c^3*d*integrate(1/16*x^3*arctan(c*
x)^2/(c^2*x^3 + x), x) + 4*b^2*c^3*d*integrate(1/16*x^3*arctan(c*x)*log(c^2
*x^2 + 1)/(c^2*x^3 + x), x) + I*b^2*c^3*d*integrate(1/16*x^3*log(c^2*x^2 +
1)^2/(c^2*x^3 + x), x) + 8*b^2*c^3*d*integrate(1/16*x^3*arctan(c*x)/(c^2*x^
3 + x), x) + 4*I*b^2*c^3*d*integrate(1/16*x^3*log(c^2*x^2 + 1)/(c^2*x^3 + x
), x) - 1/4*b^2*c*d*x*arctan(c*x)*log(c^2*x^2 + 1) - 1/16*I*b^2*c*d*x*log(c
^2*x^2 + 1)^2 + 1/4*I*b^2*d*arctan(c*x)^3 + 12*b^2*c^2*d*integrate(1/16*x^2
*arctan(c*x)^2/(c^2*x^3 + x), x) - 4*I*b^2*c^2*d*integrate(1/16*x^2*arctan(
c*x)*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + 32*a*b*c^2*d*integrate(1/16*x^2*a
rctan(c*x)/(c^2*x^3 + x), x) - 8*I*b^2*c^2*d*integrate(1/16*x^2*arctan(c*x)
/(c^2*x^3 + x), x) + 1/96*b^2*d*log(c^2*x^2 + 1)^3 + I*a^2*c*d*x + 4*b^2*c*
d*integrate(1/16*x*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + I*b^2*c
*d*integrate(1/16*x*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 1/16*b^2*d*log(c
^2*x^2 + 1)^2 + I*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*a*b*d + 12*b^2*d*i
ntegrate(1/16*arctan(c*x)^2/(c^2*x^3 + x), x) - 4*I*b^2*d*integrate(1/16*ar
ctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + b^2*d*integrate(1/16*log(c^2
*x^2 + 1)^2/(c^2*x^3 + x), x) + 32*a*b*d*integrate(1/16*arctan(c*x)/(c^2*x^
3 + x), x) + a^2*d*log(x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2\,\left(d+c\,d\,x\,1{}\mathrm{i}\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$id\left(\int a^2c\,dx+\int\left(-\frac{ia^2}{x}\right)dx+\int b^2c\,\mathrm{atan}^2(cx)\,dx+\int\left(-\frac{ib^2\,\mathrm{atan}^2(cx)}{x}\right)dx+\int 2abc\,\mathrm{atan}(cx)\,dx+\int\Bigg(-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))**2/x,x)
```

```
[Out] I*d*(Integral(a**2*c, x) + Integral(-I*a**2/x, x) + Integral(b**2*c*atan(c*
x)**2, x) + Integral(-I*b**2*atan(c*x)**2/x, x) + Integral(2*a*b*c*atan(c*x
), x) + Integral(-2*I*a*b*atan(c*x)/x, x))
```

3.73 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=228

$$bcd\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)-bcd\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)-icd\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right.}{x}$$

```
[Out] -I*c*d*(a+b*arctan(c*x))^2-d*(a+b*arctan(c*x))^2/x-2*I*c*d*(a+b*arctan(c*x)
)^2*arctanh(-1+2/(1+I*c*x))+2*b*c*d*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))-I*b
^2*c*d*polylog(2,-1+2/(1-I*c*x))+b*c*d*(a+b*arctan(c*x))*polylog(2,1-2/(1+I
*c*x))-b*c*d*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))-1/2*I*b^2*c*d*poly
log(3,1-2/(1+I*c*x))+1/2*I*b^2*c*d*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.47, antiderivative size = 228, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4852, 4924, 4868, 2447, 4850, 4988, 4884, 4994, 6610}

$$bcd\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-bcd\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-ib^2cd\text{PolyLog}\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] (-I)*c*d*(a + b*ArcTan[c*x])^2 - (d*(a + b*ArcTan[c*x])^2)/x + (2*I)*c*d*(a
 + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + 2*b*c*d*(a + b*ArcTan[c*x]
)*Log[2 - 2/(1 - I*c*x)] - I*b^2*c*d*PolyLog[2, -1 + 2/(1 - I*c*x)] + b*c*d
*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] - b*c*d*(a + b*ArcTan[c*
x])*PolyLog[2, -1 + 2/(1 + I*c*x)] - (I/2)*b^2*c*d*PolyLog[3, 1 - 2/(1 + I*
c*x)] + (I/2)*b^2*c*d*PolyLog[3, -1 + 2/(1 + I*c*x)]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
```

```
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx = \int \left(\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x^2} + \frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{x}\right)dx$$

$$= d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx + (icd)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x} + 2icd\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right) + (2bc$$

$$= -icd\left(a+b\tan^{-1}(cx)\right)^2 - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x} + 2icd\left(a+b\tan^{-1}(cx)\right)^2\tan$$

$$= -icd\left(a+b\tan^{-1}(cx)\right)^2 - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x} + 2icd\left(a+b\tan^{-1}(cx)\right)^2\tan$$

$$= -icd\left(a+b\tan^{-1}(cx)\right)^2 - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x} + 2icd\left(a+b\tan^{-1}(cx)\right)^2\tan$$

Mathematica [A] time = 0.44, size = 289, normalized size = 1.27

$$\frac{id\left(a^2cx\log(x)+ia^2+iab\left(cx\left(\log\left(c^2x^2+1\right)-2\log(cx)\right)+2\tan^{-1}(cx)\right)+iabcx(\text{Li}_2(-icx)-\text{Li}_2(icx))+ib^2\left(icx\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] (I*d*(I*a^2 + a^2*c*x*Log[x] + I*a*b*(2*ArcTan[c*x] + c*x*(-2*Log[c*x] + Lo
g[1 + c^2*x^2])) + I*b^2*(ArcTan[c*x]^2 - 2*c*x*ArcTan[c*x]*Log[1 - E^((2*I
)*ArcTan[c*x])] + I*c*x*(ArcTan[c*x]^2 + PolyLog[2, E^((2*I)*ArcTan[c*x])])
) + I*a*b*c*x*(PolyLog[2, (-I)*c*x] - PolyLog[2, I*c*x]) + (b^2*c*x*((-I)*P
i^3 + (16*I)*ArcTan[c*x]^3 + 24*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x]
)] - 24*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] + (24*I)*ArcTan[c*x]*P
olyLog[2, E^((-2*I)*ArcTan[c*x])] + (24*I)*ArcTan[c*x]*PolyLog[2, -E^((2*I)
*ArcTan[c*x])] + 12*PolyLog[3, E^((-2*I)*ArcTan[c*x])] - 12*PolyLog[3, -E^(
(2*I)*ArcTan[c*x])]))/24))/x
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{4i\,a^2cdx+4\,a^2d+\left(-i\,b^2cdx-b^2d\right)\log\left(-\frac{cx+i}{cx-i}\right)^2-\left(4\,abcdx-4i\,abd\right)\log\left(-\frac{cx+i}{cx-i}\right)}{4\,x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(4*I*a^2*c*d*x + 4*a^2*d + (-I*b^2*c*d*x - b^2*d)*log(-(c*x +
I)/(c*x - I))^2 - (4*a*b*c*d*x - 4*I*a*b*d)*log(-(c*x + I)/(c*x - I)))/x^2,
 x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 2.07, size = 5963, normalized size = 26.15

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^2,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2\ (d + c\,d\,x\,1\mathrm{i})}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$id\left(\int\left(-\frac{ia^2}{x^2}\right)dx + \int\frac{a^2c}{x}\,dx + \int\left(-\frac{ib^2\,\mathrm{atan}^2\,(cx)}{x^2}\right)dx + \int\frac{b^2c\,\mathrm{atan}^2\,(cx)}{x}\,dx + \int\left(-\frac{2iab\,\mathrm{atan}\,(cx)}{x^2}\right)dx + \int\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))**2/x**2,x)
```

```
[Out] I*d*(Integral(-I*a**2/x**2, x) + Integral(a**2*c/x, x) + Integral(-I*b**2*a
tan(c*x)**2/x**2, x) + Integral(b**2*c*atan(c*x)**2/x, x) + Integral(-2*I*a
*b*atan(c*x)/x**2, x) + Integral(2*a*b*c*atan(c*x)/x, x))
```

3.74 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx$

Optimal. Leaf size=159

$$\frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2+2ibc^2d\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{x}-$$

```
[Out] -b*c*d*(a+b*arctan(c*x))/x+1/2*c^2*d*(a+b*arctan(c*x))^2-1/2*d*(a+b*arctan(
c*x))^2/x^2-I*c*d*(a+b*arctan(c*x))^2/x+b^2*c^2*d*ln(x)-1/2*b^2*c^2*d*ln(c^
2*x^2+1)+2*I*b*c^2*d*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))+b^2*c^2*d*polylog(
2,-1+2/(1-I*c*x))
```

Rubi [A] time = 0.34, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.478, Rules used = {4876, 4852, 4918, 266, 36, 29, 31, 4884, 4924, 4868, 2447}

$$b^2c^2d\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)+\frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2+2ibc^2d\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*d*(a + b*ArcTan[c*x]))/x) + (c^2*d*(a + b*ArcTan[c*x])^2)/2 - (d*(a
+ b*ArcTan[c*x])^2)/(2*x^2) - (I*c*d*(a + b*ArcTan[c*x])^2)/x + b^2*c^2*d*L
og[x] - (b^2*c^2*d*Log[1 + c^2*x^2])/2 + (2*I)*b*c^2*d*(a + b*ArcTan[c*x])*
Log[2 - 2/(1 - I*c*x)] + b^2*c^2*d*PolyLog[2, -1 + 2/(1 - I*c*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx = \int \left(\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x^3}+\frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\right)dx$$
$$= d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx+(icd)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx$$
$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{x}+(bcd)\int \frac{a+b\tan^{-1}(cx)}{x^2\left(1+c^2x^2\right)}\,d$$
$$= c^2d\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{x}+(bc$$
$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-$$
$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-$$
$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-$$
$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-$$

Mathematica [A] time = 0.30, size = 190, normalized size = 1.19

$$-\frac{d\left(2ia^2cx+a^2-4iabc^2x^2\log(cx)+2iabc^2x^2\log\left(c^2x^2+1\right)+2b\tan^{-1}(cx)\left(ac^2x^2+2iacx+a-2ibc^2x^2\log\left(1-\right.\right.\right.}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -1/2*(d*(a^2 + (2*I)*a^2*c*x + 2*a*b*c*x - b^2*(-I + c*x)^2*ArcTan[c*x]^2 +
 2*b*ArcTan[c*x]*(a + (2*I)*a*c*x + b*c*x + a*c^2*x^2 - (2*I)*b*c^2*x^2*Log
[1 - E^((2*I)*ArcTan[c*x])]) - (4*I)*a*b*c^2*x^2*Log[c*x] - 2*b^2*c^2*x^2*L
og[(c*x)/Sqrt[1 + c^2*x^2]] + (2*I)*a*b*c^2*x^2*Log[1 + c^2*x^2] - 2*b^2*c^
2*x^2*PolyLog[2, E^((2*I)*ArcTan[c*x])]))/x^2
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\frac{8\,x^2\mathrm{integral}\left(\frac{2i\,a^2c^3dx^3+2\,a^2c^2dx^2+2i\,a^2cdx+2\,a^2d-\left(2\,abc^3dx^3+2\left(-i\,ab+b^2\right)c^2dx^2+\left(2\,ab-i\,b^2\right)cdx-2i\,abd\right)\log\left(-\frac{cx+i}{cx-i}\right)}{2\left(c^2x^5+x^3\right)},x\right)+\left(2i\,b^2cdx+b^2\right.}{8\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] 1/8*(8*x^2*integral(1/2*(2*I*a^2*c^3*d*x^3 + 2*a^2*c^2*d*x^2 + 2*I*a^2*c*d*
x + 2*a^2*d - (2*a*b*c^3*d*x^3 + 2*(-I*a*b + b^2)*c^2*d*x^2 + (2*a*b - I*b^
2)*c*d*x - 2*I*a*b*d)*log(-(c*x + I)/(c*x - I)))/(c^2*x^5 + x^3), x) + (2*I
*b^2*c*d*x + b^2*d)*log(-(c*x + I)/(c*x - I))^2)/x^2
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.13, size = 487, normalized size = 3.06

$$2ic^2dab\ln(cx)-ic^2dab\ln\left(c^2x^2+1\right)-\frac{icd\,b^2\arctan(cx)^2}{x}-ic^2d\,b^2\arctan(cx)\ln\left(c^2x^2+1\right)+2ic^2d\,b^2\arctan(cx)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^3,x)
```

```
[Out] -I*c^2*d*a*b*ln(c^2*x^2+1)-I*c*d*b^2*arctan(c*x)^2/x-I*c^2*d*b^2*arctan(c*x
)*ln(c^2*x^2+1)+2*I*c^2*d*b^2*arctan(c*x)*ln(c*x)+2*I*c^2*d*a*b*ln(c*x)-2*I
*c*d*a*b*arctan(c*x)/x-1/2*b^2*c^2*d*ln(c^2*x^2+1)-1/2*d*a^2/x^2-c^2*d*b^2*
ln(c*x)*ln(1+I*c*x)+c^2*d*b^2*ln(c*x)*ln(1-I*c*x)-c^2*d*a*b*arctan(c*x)-c*d
*b^2*arctan(c*x)/x-I*c*d*a^2/x-c*d*a*b/x-d*a*b*arctan(c*x)/x^2-1/2*c^2*d*b^
2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/2*c^2*d*b^2*ln(I+c*x)*ln(c^2*x^2+1)+1/2*c^
2*d*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))+1/2*c^2*d*b^2*ln(c*x-I)*ln(c^2*x^2+1)-1
/2*c^2*d*b^2*arctan(c*x)^2-c^2*d*b^2*dilog(1+I*c*x)+c^2*d*b^2*dilog(1-I*c*x
)-1/2*c^2*d*b^2*dilog(-1/2*I*(I+c*x))+1/4*c^2*d*b^2*ln(I+c*x)^2+1/2*c^2*d*b
^2*dilog(1/2*I*(c*x-I))+c^2*d*b^2*ln(c*x)-1/4*c^2*d*b^2*ln(c*x-I)^2-1/2*d*b
^2*arctan(c*x)^2/x^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))^2\ (d+c\,d\,x\,1\mathrm{i})}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x^3,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))**2/x**3,x)
```

```
[Out] Timed out
```

3.75 $\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx$

Optimal. Leaf size=224

$$-\frac{1}{6}ic^3d\left(a+b\tan^{-1}(cx)\right)^2-\frac{2}{3}bc^3d\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{ibc^2d\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{d\left(a+b\tan^{-1}(cx)\right.}{3x^3}$$

```
[Out] -1/3*b^2*c^2*d/x-1/3*b^2*c^3*d*arctan(c*x)-1/3*b*c*d*(a+b*arctan(c*x))/x^2-
I*b*c^2*d*(a+b*arctan(c*x))/x-1/6*I*c^3*d*(a+b*arctan(c*x))^2-1/3*d*(a+b*ar
ctan(c*x))^2/x^3-1/2*I*c*d*(a+b*arctan(c*x))^2/x^2+I*b^2*c^3*d*ln(x)-1/2*I*
b^2*c^3*d*ln(c^2*x^2+1)-2/3*b*c^3*d*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))+1/3
*I*b^2*c^3*d*polylog(2,-1+2/(1-I*c*x))
```

Rubi [A] time = 0.43, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {4876, 4852, 4918, 325, 203, 4924, 4868, 2447, 266, 36, 29, 31, 4884}

$$\frac{1}{3}ib^2c^3d\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)-\frac{1}{6}ic^3d\left(a+b\tan^{-1}(cx)\right)^2-\frac{ibc^2d\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{2}{3}bc^3d\log\left(2-\frac{2}{1-icx}\right)(a$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x^4,x]
```

```
[Out] -(b^2*c^2*d)/(3*x) - (b^2*c^3*d*ArcTan[c*x])/3 - (b*c*d*(a + b*ArcTan[c*x])
)/(3*x^2) - (I*b*c^2*d*(a + b*ArcTan[c*x]))/x - (I/6)*c^3*d*(a + b*ArcTan[c
*x])^2 - (d*(a + b*ArcTan[c*x])^2)/(3*x^3) - ((I/2)*c*d*(a + b*ArcTan[c*x])
^2)/x^2 + I*b^2*c^3*d*Log[x] - (I/2)*b^2*c^3*d*Log[1 + c^2*x^2] - (2*b*c^3*
d*(a + b*ArcTan[c*x])*Log[2 - 2/(1 - I*c*x)])/3 + (I/3)*b^2*c^3*d*PolyLog[2
, -1 + 2/(1 - I*c*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{(d+icdx)\left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx = \int\left(\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x^4}+\frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\right)dx$$

$$= d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx + (icd)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{3x^3} - \frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{2x^2} + \frac{1}{3}(2bcd)\int \frac{a+b\tan^{-1}(cx}{x^3\left(1+c^2x^2\right)}$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{3x^3} - \frac{icd\left(a+b\tan^{-1}(cx)\right)^2}{2x^2} + \frac{1}{3}(2bcd)\int \frac{a+b\tan^{-1}(cx}{x^3}$$

$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{ibc^2d\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{1}{6}ic^3d\left(a+b\tan^{-1}(cx)\right)^2$$

$$= -\frac{b^2c^2d}{3x} - \frac{bcd\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{ibc^2d\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{1}{6}ic^3d\left(a+b\tan\right.$$

$$= -\frac{b^2c^2d}{3x} - \frac{1}{3}b^2c^3d\tan^{-1}(cx) - \frac{bcd\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{ibc^2d\left(a+b\tan^{-1}(cx\right.}{x}$$

$$= -\frac{b^2c^2d}{3x} - \frac{1}{3}b^2c^3d\tan^{-1}(cx) - \frac{bcd\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{ibc^2d\left(a+b\tan^{-1}(cx\right.}{x}$$

Mathematica [A] time = 0.55, size = 240, normalized size = 1.07

$$d\left(-3ia^2cx-2a^2-4abc^3x^3\log(cx)-6iabc^2x^2+2abc^3x^3\log\left(c^2x^2+1\right)-2b\tan^{-1}(cx)\left(a\left(3ic^3x^3+3icx+2\right)+2\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)*(a + b*ArcTan[c*x])^2)/x^4,x]
```

```
[Out] (d*(-2*a^2 - (3*I)*a^2*c*x - 2*a*b*c*x - (6*I)*a*b*c^2*x^2 - 2*b^2*c^2*x^2
- I*b^2*(-2*I + 3*c*x + c^3*x^3)*ArcTan[c*x]^2 - 2*b*ArcTan[c*x]*(b*c*x*(1
+ (3*I)*c*x + c^2*x^2) + a*(2 + (3*I)*c*x + (3*I)*c^3*x^3) + 2*b*c^3*x^3*Lo
g[1 - E^((2*I)*ArcTan[c*x])]) - 4*a*b*c^3*x^3*Log[c*x] + (6*I)*b^2*c^3*x^3*
Log[(c*x)/Sqrt[1 + c^2*x^2]] + 2*a*b*c^3*x^3*Log[1 + c^2*x^2] + (2*I)*b^2*c
^3*x^3*PolyLog[2, E^((2*I)*ArcTan[c*x])]))/(6*x^3)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\frac{24\,x^3\text{integral}\left(\frac{6i\,a^2c^3dx^3+6\,a^2c^2dx^2+6i\,a^2cdx+6\,a^2d-\left(6\,abc^3dx^3+3\left(-2i\,ab+b^2\right)c^2dx^2+\left(6\,ab-2i\,b^2\right)cdx-6i\,abd\right)\log\left(-\frac{cx+i}{cx-i}\right)}{6\left(c^2x^6+x^4\right)},x\right)+\left(3i\,b^2cdx+\right.}{24\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] 1/24*(24*x^3*integral(1/6*(6*I*a^2*c^3*d*x^3 + 6*a^2*c^2*d*x^2 + 6*I*a^2*c*
d*x + 6*a^2*d - (6*a*b*c^3*d*x^3 + 3*(-2*I*a*b + b^2)*c^2*d*x^2 + (6*a*b -
2*I*b^2)*c*d*x - 6*I*a*b*d)*log(-(c*x + I)/(c*x - I)))/(c^2*x^6 + x^4), x)
+ (3*I*b^2*c*d*x + 2*b^2*d)*log(-(c*x + I)/(c*x - I))^2)/x^3
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.12, size = 556, normalized size = 2.48

$$-\frac{ic^2 d b^2 \arctan(cx)}{x} - \frac{d a^2}{3x^3} - \frac{icdab \arctan(cx)}{x^2} - \frac{cdab}{3x^2} - \frac{2dab \arctan(cx)}{3x^3} + \frac{c^3 dab \ln(c^2x^2+1)}{3} - \frac{cd b^2 \arctan(cx)}{3x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^4,x)
```

```
[Out] -1/3*d*a^2/x^3-I*c*d*a*b*arctan(c*x)/x^2-1/3*c*d*a*b/x^2-2/3*d*a*b*arctan(c
*x)/x^3+1/3*c^3*d*a*b*ln(c^2*x^2+1)-1/3*c*d*b^2*arctan(c*x)/x^2-2/3*c^3*d*a
*b*ln(c*x)-2/3*c^3*d*b^2*ln(c*x)*arctan(c*x)+1/3*c^3*d*b^2*arctan(c*x)*ln(c
^2*x^2+1)+I*c^3*d*b^2*ln(c*x)+1/6*I*c^3*d*b^2*dilog(1/2*I*(c*x-I))-1/6*I*c^
3*d*b^2*dilog(-1/2*I*(I+c*x))-1/3*I*c^3*d*b^2*dilog(1+I*c*x)+1/12*I*c^3*d*b
^2*ln(I+c*x)^2-1/2*I*c*d*a^2/x^2-1/2*I*c^3*d*b^2*arctan(c*x)^2+1/3*I*c^3*d*
b^2*dilog(1-I*c*x)-1/3*b^2*c^2*d/x-1/2*I*b^2*c^3*d*ln(c^2*x^2+1)-1/3*b^2*c^
3*d*arctan(c*x)-1/3*d*b^2*arctan(c*x)^2/x^3-I*c^2*d*a*b/x+1/6*I*c^3*d*b^2*l
n(c*x-I)*ln(c^2*x^2+1)+1/6*I*c^3*d*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))-I*c^3*d*
a*b*arctan(c*x)+1/3*I*c^3*d*b^2*ln(c*x)*ln(1-I*c*x)-1/6*I*c^3*d*b^2*ln(I+c*
x)*ln(c^2*x^2+1)-1/6*I*c^3*d*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/2*I*c*d*b^2
*arctan(c*x)^2/x^2-I*c^2*d*b^2*arctan(c*x)/x-1/3*I*c^3*d*b^2*ln(c*x)*ln(1+I
*c*x)-1/12*I*c^3*d*b^2*ln(c*x-I)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-i\left(\left(c\arctan(cx) + \frac{1}{x}\right)c + \frac{\arctan(cx)}{x^2}\right)abcd + \frac{1}{3}\left(\left(c^2\log\left(c^2x^2+1\right) - c^2\log\left(x^2\right) - \frac{1}{x^2}\right)c - \frac{2\arctan(cx)}{x^3}\right)abd -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] -I*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*a*b*c*d + 1/3*((c^2*log(c^2*
x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*a*b*d - 1/2*I*a^2*c
*d/x^2 - 1/3*a^2*d/x^3 + 1/96*(96*I*x^3*integrate(1/48*(20*b^2*c^2*d*x^2*ar
ctan(c*x) + 36*(b^2*c^3*d*x^3 + b^2*c*d*x)*arctan(c*x)^2 + 3*(b^2*c^3*d*x^3
 + b^2*c*d*x)*log(c^2*x^2 + 1)^2 - 2*(3*b^2*c^3*d*x^3 - 2*b^2*c*d*x + 6*(b^
2*c^2*d*x^2 + b^2*d)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^6 + x^4), x) + 9
6*x^3*integrate(1/48*(36*(b^2*c^2*d*x^2 + b^2*d)*arctan(c*x)^2 + 3*(b^2*c^2
*d*x^2 + b^2*d)*log(c^2*x^2 + 1)^2 - 4*(3*b^2*c^3*d*x^3 - 2*b^2*c*d*x)*arct
an(c*x) - 2*(5*b^2*c^2*d*x^2 - 6*(b^2*c^3*d*x^3 + b^2*c*d*x)*arctan(c*x))*l
og(c^2*x^2 + 1))/(c^2*x^6 + x^4), x) + (-12*I*b^2*c*d*x - 8*b^2*d)*arctan(c
*x)^2 + 4*(3*b^2*c*d*x - 2*I*b^2*d)*arctan(c*x)*log(c^2*x^2 + 1) + (3*I*b^2
*c*d*x + 2*b^2*d)*log(c^2*x^2 + 1)^2)/x^3
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))^2\ (d+c\,d\,x\,1\mathrm{i})}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x^4,x)
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i))/x^4, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))**2/x**4,x)
[Out] Timed out
```

3.76 $\int x^3(d + icdx)^2 \left(a + b\tan^{-1}(cx)\right)^2 dx$

Optimal. Leaf size=373

$$-\frac{49d^2\left(a+b\tan^{-1}(cx)\right)^2}{60c^4}+\frac{4ibd^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{5c^4}+\frac{5abd^2x}{6c^3}-\frac{1}{6}c^2d^2x^6\left(a+b\tan^{-1}(cx)\right)^2+\frac{2ibd^2x^2\left(\right.}{}$$

```
[Out] 5/6*a*b*d^2*x/c^3-1/5*I*b*d^2*x^4*(a+b*arctan(c*x))+31/180*b^2*d^2*x^2/c^2+
4/5*I*b*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^4-1/60*b^2*d^2*x^4+2/5*I*c*
d^2*x^5*(a+b*arctan(c*x))^2+5/6*b^2*d^2*x*arctan(c*x)/c^3+3/5*I*b^2*d^2*arc
tan(c*x)/c^4-5/18*b*d^2*x^3*(a+b*arctan(c*x))/c-3/5*I*b^2*d^2*x/c^3+1/15*b*
c*d^2*x^5*(a+b*arctan(c*x))-49/60*d^2*(a+b*arctan(c*x))^2/c^4+1/4*d^2*x^4*(
a+b*arctan(c*x))^2+1/15*I*b^2*d^2*x^3/c-1/6*c^2*d^2*x^6*(a+b*arctan(c*x))^2
+2/5*I*b*d^2*x^2*(a+b*arctan(c*x))/c^2-53/90*b^2*d^2*ln(c^2*x^2+1)/c^4-2/5*
b^2*d^2*polylog(2,1-2/(1+I*c*x))/c^4
```

Rubi [A] time = 0.97, antiderivative size = 373, normalized size of antiderivative = 1.00, number of steps used = 43, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4876, 4852, 4916, 266, 43, 4846, 260, 4884, 302, 203, 321, 4920, 4854, 2402, 2315}

$$-\frac{2b^2d^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{5c^4}-\frac{1}{6}c^2d^2x^6\left(a+b\tan^{-1}(cx)\right)^2+\frac{2ibd^2x^2\left(a+b\tan^{-1}(cx)\right)}{5c^2}+\frac{5abd^2x}{6c^3}-\frac{49d^2\left(a+b\tan\right.}{60c}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (5*a*b*d^2*x)/(6*c^3) - (((3*I)/5)*b^2*d^2*x)/c^3 + (31*b^2*d^2*x^2)/(180*c
^2) + ((I/15)*b^2*d^2*x^3)/c - (b^2*d^2*x^4)/60 + (((3*I)/5)*b^2*d^2*ArcTan
[c*x])/c^4 + (5*b^2*d^2*x*ArcTan[c*x])/(6*c^3) + (((2*I)/5)*b*d^2*x^2*(a +
b*ArcTan[c*x]))/c^2 - (5*b*d^2*x^3*(a + b*ArcTan[c*x]))/(18*c) - (I/5)*b*d^
2*x^4*(a + b*ArcTan[c*x]) + (b*c*d^2*x^5*(a + b*ArcTan[c*x]))/15 - (49*d^2*
(a + b*ArcTan[c*x])^2)/(60*c^4) + (d^2*x^4*(a + b*ArcTan[c*x])^2)/4 + ((2*I
)/5)*c*d^2*x^5*(a + b*ArcTan[c*x])^2 - (c^2*d^2*x^6*(a + b*ArcTan[c*x])^2)/
6 + (((4*I)/5)*b*d^2*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c^4 - (53*b^2*
d^2*Log[1 + c^2*x^2])/(90*c^4) - (2*b^2*d^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/
(5*c^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x^3(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(d^2x^3\left(a+b\tan^{-1}(cx)\right)^2+2icd^2x^4\left(a+b\tan^{-1}(cx)\right)^2-c^2d^2x^5\left(a-\right.\right.$$

$$=d^2\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx+\left(2icd^2\right)\int x^4\left(a+b\tan^{-1}(cx)\right)^2\,dx-$$

$$=\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{2}{5}icd^2x^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{6}c^2d^2x^6\left(a-\right.$$

$$=\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{2}{5}icd^2x^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{6}c^2d^2x^6\left(a-\right.$$

$$=-\frac{bd^2x^3\left(a+b\tan^{-1}(cx)\right)}{6c}-\frac{1}{5}ibd^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{15}bcd^2x^5\left(a\right.$$

$$=\frac{abd^2x}{2c^3}+\frac{2ibd^2x^2\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{5bd^2x^3\left(a+b\tan^{-1}(cx)\right)}{18c}-\frac{1}{5}ib$$

$$=\frac{5abd^2x}{6c^3}-\frac{3ib^2d^2x}{5c^3}+\frac{ib^2d^2x^3}{15c}+\frac{b^2d^2x\tan^{-1}(cx)}{2c^3}+\frac{2ibd^2x^2\left(a+b\tan\right.}{5c^2}$$

$$=\frac{5abd^2x}{6c^3}-\frac{3ib^2d^2x}{5c^3}+\frac{7b^2d^2x^2}{60c^2}+\frac{ib^2d^2x^3}{15c}-\frac{1}{60}b^2d^2x^4+\frac{3ib^2d^2\tan^{-1}(}{5c^4}$$

$$=\frac{5abd^2x}{6c^3}-\frac{3ib^2d^2x}{5c^3}+\frac{31b^2d^2x^2}{180c^2}+\frac{ib^2d^2x^3}{15c}-\frac{1}{60}b^2d^2x^4+\frac{3ib^2d^2\tan^{-1}}{5c^4}$$

Mathematica [A] time = 1.28, size = 342, normalized size = 0.92

$$\frac{d^2\left(-30a^2c^6x^6+72ia^2c^5x^5+45a^2c^4x^4+12abc^5x^5-36iabc^4x^4-50abc^3x^3+72iabc^2x^2-72iab\log\left(c^2x^2+1\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (d^2*((108*I)*a*b + 34*b^2 + 150*a*b*c*x - (108*I)*b^2*c*x + (72*I)*a*b*c^2
*x^2 + 31*b^2*c^2*x^2 - 50*a*b*c^3*x^3 + (12*I)*b^2*c^3*x^3 + 45*a^2*c^4*x^
```

```
4 - (36*I)*a*b*c^4*x^4 - 3*b^2*c^4*x^4 + (72*I)*a^2*c^5*x^5 + 12*a*b*c^5*x^
5 - 30*a^2*c^6*x^6 - 3*b^2*(1 - 15*c^4*x^4 - (24*I)*c^5*x^5 + 10*c^6*x^6)*A
rcTan[c*x]^2 + 2*b*ArcTan[c*x]*(b*(54*I + 75*c*x + (36*I)*c^2*x^2 - 25*c^3*
x^3 - (18*I)*c^4*x^4 + 6*c^5*x^5) + a*(-75 + 45*c^4*x^4 + (72*I)*c^5*x^5 -
30*c^6*x^6) + (72*I)*b*Log[1 + E^((2*I)*ArcTan[c*x])]) - (72*I)*a*b*Log[1 +
 c^2*x^2] - 106*b^2*Log[1 + c^2*x^2] + 72*b^2*PolyLog[2, -E^((2*I)*ArcTan[c
*x])]))/(180*c^4)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\frac{1}{240}\left(10\,b^2c^2d^2x^6-24i\,b^2cd^2x^5-15\,b^2d^2x^4\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(-\frac{60\,a^2c^4d^2x^7-120i\,a^2c^3d^2x^6-120i\,a^2cd^2\cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/240*(10*b^2*c^2*d^2*x^6 - 24*I*b^2*c*d^2*x^5 - 15*b^2*d^2*x^4)*log(-(c*x
+ I)/(c*x - I))^2 + integral(-1/60*(60*a^2*c^4*d^2*x^7 - 120*I*a^2*c^3*d^2*
x^6 - 120*I*a^2*c*d^2*x^4 - 60*a^2*d^2*x^3 - (-60*I*a*b*c^4*d^2*x^7 - (120*
a*b - 10*I*b^2)*c^3*d^2*x^6 + 24*b^2*c^2*d^2*x^5 - (120*a*b + 15*I*b^2)*c*d
^2*x^4 + 60*I*a*b*d^2*x^3)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.11, size = 650, normalized size = 1.74

$$\frac{d^2a^2x^4}{4}+\frac{4ic\,d^2ab\arctan(cx)\,x^5}{5}-\frac{c^2d^2ab\arctan(cx)\,x^6}{3}+\frac{2id^2b^2\arctan(cx)\,x^2}{5c^2}+\frac{2id^2ab\,x^2}{5c^2}-\frac{2id^2ab\ln\left(c^2x^2+1\right)}{5c^4}+\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/4*d^2*a^2*x^4+4/5*I*c*d^2*a*b*arctan(c*x)*x^5-2/5*I/c^4*d^2*a*b*ln(c^2*x^
2+1)+2/5*I/c^2*d^2*a*b*x^2+2/5*I/c^2*d^2*b^2*arctan(c*x)*x^2+2/5*I*c*d^2*b^
2*arctan(c*x)^2*x^5-1/3*c^2*d^2*a*b*arctan(c*x)*x^6-2/5*I/c^4*d^2*b^2*arcta
n(c*x)*ln(c^2*x^2+1)+3/5*I*b^2*d^2*arctan(c*x)/c^4+5/6*a*b*d^2*x/c^3+5/6*b^
2*d^2*x*arctan(c*x)/c^3+31/180*b^2*d^2*x^2/c^2-3/5*I*b^2*d^2*x/c^3+1/15*I*b
^2*d^2*x^3/c-53/90*b^2*d^2*ln(c^2*x^2+1)/c^4-1/5*I*d^2*a*b*x^4+1/2*d^2*a*b*
arctan(c*x)*x^4+1/5/c^4*d^2*b^2*ln(c*x-I)*ln(c^2*x^2+1)-5/6/c^4*d^2*a*b*arc
tan(c*x)+1/15*c*d^2*b^2*arctan(c*x)*x^5-5/18/c*d^2*b^2*arctan(c*x)*x^3-1/6*
c^2*d^2*b^2*arctan(c*x)^2*x^6-1/5/c^4*d^2*b^2*ln(I+c*x)*ln(c^2*x^2+1)-1/5/c
^4*d^2*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/5/c^4*d^2*b^2*ln(I+c*x)*ln(1/2*I*
(c*x-I))-1/5*I*d^2*b^2*arctan(c*x)*x^4+2/5*I*c*d^2*a^2*x^5+1/15*c*d^2*a*b*x
^5-5/18/c*d^2*a*b*x^3+1/4*d^2*b^2*arctan(c*x)^2*x^4+1/10/c^4*d^2*b^2*ln(I+c
*x)^2-1/10/c^4*d^2*b^2*ln(c*x-I)^2+1/5/c^4*d^2*b^2*dilog(1/2*I*(c*x-I))-5/1
2/c^4*d^2*b^2*arctan(c*x)^2-1/5/c^4*d^2*b^2*dilog(-1/2*I*(I+c*x))-1/6*c^2*d
^2*a^2*x^6-1/60*b^2*d^2*x^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}\,a^2c^2d^2x^6+\frac{2}{5}i\,a^2cd^2x^5+\frac{1}{4}\,b^2d^2x^4\arctan(cx)^2+\frac{1}{4}\,a^2d^2x^4-\frac{1}{45}\left(15\,x^6\arctan(cx)-c\left(\frac{3\,c^4x^5-5\,c^2x^3+15\,x}{c^6}-\frac{15\cdots}{\cdots}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/6*a^2*c^2*d^2*x^6 + 2/5*I*a^2*c*d^2*x^5 + 1/4*b^2*d^2*x^4*arctan(c*x)^2
+ 1/4*a^2*d^2*x^4 - 1/45*(15*x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 +
15*x)/c^6 - 15*arctan(c*x)/c^7))*a*b*c^2*d^2 + 1/5*I*(4*x^5*arctan(c*x) - c
*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*a*b*c*d^2 + 1/6*(3*x^4*a
rctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*b*d^2 - 1/12*(2
*c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)*arctan(c*x) - (c^2*x^2 + 3*arc
tan(c*x)^2 - 4*log(c^2*x^2 + 1))/c^4)*b^2*d^2 - 1/480*(20*b^2*c^2*d^2*x^6 -
 48*I*b^2*c*d^2*x^5)*arctan(c*x)^2 + 1/120*(-5*I*b^2*c^2*d^2*x^6 - 12*b^2*c
*d^2*x^5)*arctan(c*x)*log(c^2*x^2 + 1) + 1/480*(5*b^2*c^2*d^2*x^6 - 12*I*b^
2*c*d^2*x^5)*log(c^2*x^2 + 1)^2 - integrate(-1/240*(68*b^2*c^3*d^2*x^6*arct
an(c*x) - 180*(b^2*c^4*d^2*x^7 + b^2*c^2*d^2*x^5)*arctan(c*x)^2 - 15*(b^2*c
^4*d^2*x^7 + b^2*c^2*d^2*x^5)*log(c^2*x^2 + 1)^2 - 2*(5*b^2*c^4*d^2*x^7 - 1
2*b^2*c^2*d^2*x^5 - 60*(b^2*c^3*d^2*x^6 + b^2*c*d^2*x^4)*arctan(c*x))*log(c
^2*x^2 + 1))/(c^2*x^2 + 1), x) + I*integrate(1/120*(180*(b^2*c^3*d^2*x^6 +
b^2*c*d^2*x^4)*arctan(c*x)^2 + 15*(b^2*c^3*d^2*x^6 + b^2*c*d^2*x^4)*log(c^2
*x^2 + 1)^2 + 2*(5*b^2*c^4*d^2*x^7 - 12*b^2*c^2*d^2*x^5)*arctan(c*x) + (17*
b^2*c^3*d^2*x^6 + 30*(b^2*c^4*d^2*x^7 + b^2*c^2*d^2*x^5)*arctan(c*x))*log(c
^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))^2*(d + c*d*x*1i)^2,x)
```

```
[Out] int(x^3*(a + b*atan(c*x))^2*(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+I*c*d*x)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.77 $\int x^2(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=333

$$-\frac{31id^2\left(a+b\tan^{-1}(cx)\right)^2}{30c^3}-\frac{16bd^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{15c^3}-\frac{1}{5}c^2d^2x^5\left(a+b\tan^{-1}(cx)\right)^2+\frac{iabd^2x}{c^2}+\frac{1}{2}icd^2x^4\left(a\right.$$

```
[Out] -31/30*I*d^2*(a+b*arctan(c*x))^2/c^3+19/30*b^2*d^2*x/c^2+I*a*b*d^2*x/c^2-1/
30*b^2*d^2*x^3-19/30*b^2*d^2*arctan(c*x)/c^3-8/15*I*b^2*d^2*polylog(2,1-2/(
1+I*c*x))/c^3-8/15*b*d^2*x^2*(a+b*arctan(c*x))/c+1/2*I*c*d^2*x^4*(a+b*arcta
n(c*x))^2+1/10*b*c*d^2*x^4*(a+b*arctan(c*x))+1/6*I*b^2*d^2*x^2/c+1/3*d^2*x^
3*(a+b*arctan(c*x))^2-1/3*I*b*d^2*x^3*(a+b*arctan(c*x))-1/5*c^2*d^2*x^5*(a+
b*arctan(c*x))^2-16/15*b*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3-2/3*I*b^
2*d^2*ln(c^2*x^2+1)/c^3+I*b^2*d^2*x*arctan(c*x)/c^2
```

Rubi [A] time = 0.86, antiderivative size = 333, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4876, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 266, 43, 4846, 260, 4884, 302}

$$-\frac{8ib^2d^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{15c^3}-\frac{1}{5}c^2d^2x^5\left(a+b\tan^{-1}(cx)\right)^2+\frac{iabd^2x}{c^2}-\frac{31id^2\left(a+b\tan^{-1}(cx)\right)^2}{30c^3}-\frac{16bd^2\log\left(\frac{2}{1+icx}\right)}{15}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (I*a*b*d^2*x)/c^2 + (19*b^2*d^2*x)/(30*c^2) + ((I/6)*b^2*d^2*x^2)/c - (b^2*
d^2*x^3)/30 - (19*b^2*d^2*ArcTan[c*x])/(30*c^3) + (I*b^2*d^2*x*ArcTan[c*x])
/c^2 - (8*b*d^2*x^2*(a + b*ArcTan[c*x]))/(15*c) - (I/3)*b*d^2*x^3*(a + b*Ar
cTan[c*x]) + (b*c*d^2*x^4*(a + b*ArcTan[c*x]))/10 - (((31*I)/30)*d^2*(a + b
*ArcTan[c*x])^2)/c^3 + (d^2*x^3*(a + b*ArcTan[c*x])^2)/3 + (I/2)*c*d^2*x^4*
(a + b*ArcTan[c*x])^2 - (c^2*d^2*x^5*(a + b*ArcTan[c*x])^2)/5 - (16*b*d^2*(
a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(15*c^3) - (((2*I)/3)*b^2*d^2*Log[1
+ c^2*x^2])/c^3 - (((8*I)/15)*b^2*d^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/c^3
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x^2(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx = \int\left(d^2x^2\left(a+b\tan^{-1}(cx)\right)^2+2icd^2x^3\left(a+b\tan^{-1}(cx)\right)^2-c^2d^2x^4\left(a+b\right.\right.$$

$$= d^2\int x^2\left(a+b\tan^{-1}(cx)\right)^2\,dx+\left(2icd^2\right)\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx-\left(c\right.$$

$$= \frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{2}icd^2x^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{5}c^2d^2x^5\left(a+b\right.$$

$$= \frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{2}icd^2x^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{5}c^2d^2x^5\left(a+b\right.$$

$$= -\frac{bd^2x^2\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{1}{3}ibd^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{10}bcd^2x^4\left(a+b\right.$$

$$= \frac{iabd^2x}{c^2}+\frac{b^2d^2x}{3c^2}-\frac{8bd^2x^2\left(a+b\tan^{-1}(cx)\right)}{15c}-\frac{1}{3}ibd^2x^3\left(a+b\tan^{-1}(cx)\right)$$

$$= \frac{iabd^2x}{c^2}+\frac{19b^2d^2x}{30c^2}-\frac{1}{30}b^2d^2x^3-\frac{b^2d^2\tan^{-1}(cx)}{3c^3}+\frac{ib^2d^2x\tan^{-1}(cx)}{c^2}-\frac{8}{}$$

$$= \frac{iabd^2x}{c^2}+\frac{19b^2d^2x}{30c^2}+\frac{ib^2d^2x^2}{6c}-\frac{1}{30}b^2d^2x^3-\frac{19b^2d^2\tan^{-1}(cx)}{30c^3}+\frac{ib^2d^2x\,t}{c}$$

$$= \frac{iabd^2x}{c^2}+\frac{19b^2d^2x}{30c^2}+\frac{ib^2d^2x^2}{6c}-\frac{1}{30}b^2d^2x^3-\frac{19b^2d^2\tan^{-1}(cx)}{30c^3}+\frac{ib^2d^2x\,t}{c}$$

Mathematica [A] time = 1.25, size = 306, normalized size = 0.92

$$-\frac{d^2\left(6a^2c^5x^5-15ia^2c^4x^4-10a^2c^3x^3-3abc^4x^4+10iabc^3x^3+16abc^2x^2-16ab\log\left(c^2x^2+1\right)+b\tan^{-1}(cx)\left(2a\left(\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] -1/30*(d^2*(9*a*b - (5*I)*b^2 - (30*I)*a*b*c*x - 19*b^2*c*x + 16*a*b*c^2*x^
2 - (5*I)*b^2*c^2*x^2 - 10*a^2*c^3*x^3 + (10*I)*a*b*c^3*x^3 + b^2*c^3*x^3 -
 (15*I)*a^2*c^4*x^4 - 3*a*b*c^4*x^4 + 6*a^2*c^5*x^5 + b^2*(-I + c*x)^3*(-1
+ (3*I)*c*x + 6*c^2*x^2)*ArcTan[c*x]^2 + b*ArcTan[c*x]*(b*(19 - (30*I)*c*x
```

```
+ 16*c^2*x^2 + (10*I)*c^3*x^3 - 3*c^4*x^4) + 2*a*(15*I - 10*c^3*x^3 - (15*I
)*c^4*x^4 + 6*c^5*x^5) + 32*b*Log[1 + E^((2*I)*ArcTan[c*x])]) - 16*a*b*Log[
1 + c^2*x^2] + (20*I)*b^2*Log[1 + c^2*x^2] - (16*I)*b^2*PolyLog[2, -E^((2*I
)*ArcTan[c*x])]))/c^3
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\frac{1}{120}\left(6\,b^2c^2d^2x^5-15i\,b^2cd^2x^4-10\,b^2d^2x^3\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(-\frac{30\,a^2c^4d^2x^6-60i\,a^2c^3d^2x^5-60i\,a^2cd^2\cdots}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/120*(6*b^2*c^2*d^2*x^5 - 15*I*b^2*c*d^2*x^4 - 10*b^2*d^2*x^3)*log(-(c*x +
 I)/(c*x - I))^2 + integral(-1/30*(30*a^2*c^4*d^2*x^6 - 60*I*a^2*c^3*d^2*x^
5 - 60*I*a^2*c*d^2*x^3 - 30*a^2*d^2*x^2 - (-30*I*a*b*c^4*d^2*x^6 - (60*a*b
- 6*I*b^2)*c^3*d^2*x^5 + 15*b^2*c^2*d^2*x^4 - (60*a*b + 10*I*b^2)*c*d^2*x^3
 + 30*I*a*b*d^2*x^2)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 612, normalized size = 1.84

$$\frac{d^2a^2x^3}{3}+\frac{ib^2d^2x\arctan(cx)}{c^2}+\frac{19b^2d^2x}{30c^2}+\frac{ic\,d^2b^2\arctan(cx)^2\,x^4}{2}+\frac{4id^2b^2\ln(cx+i)\ln\left(\frac{i(cx-i)}{2}\right)}{15c^3}-\frac{id^2ab\arctan(cx)}{c^3}\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/3*d^2*a^2*x^3-4/15*I/c^3*d^2*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-4/15*I/c^3*
d^2*b^2*ln(I+c*x)*ln(c^2*x^2+1)+4/15*I/c^3*d^2*b^2*ln(c*x-I)*ln(c^2*x^2+1)+
1/2*I*c*d^2*b^2*arctan(c*x)^2*x^4+4/15*I/c^3*d^2*b^2*ln(I+c*x)*ln(1/2*I*(c*
x-I))+1/6*I*b^2*d^2*x^2/c+19/30*b^2*d^2*x/c^2-I/c^3*d^2*a*b*arctan(c*x)+I*a
*b*d^2*x/c^2+I*b^2*d^2*x*arctan(c*x)/c^2-2/3*I*b^2*d^2*ln(c^2*x^2+1)/c^3+I*
c*d^2*a*b*arctan(c*x)*x^4+8/15/c^3*d^2*a*b*ln(c^2*x^2+1)-8/15/c*d^2*a*b*x^2
+4/15*I/c^3*d^2*b^2*dilog(1/2*I*(c*x-I))-1/3*I*d^2*b^2*arctan(c*x)*x^3+1/2*
I*c*d^2*a^2*x^4+1/10*c*d^2*a*b*x^4+2/3*d^2*a*b*arctan(c*x)*x^3+8/15/c^3*d^2
*b^2*arctan(c*x)*ln(c^2*x^2+1)-8/15/c*d^2*b^2*arctan(c*x)*x^2-1/5*c^2*d^2*b
^2*arctan(c*x)^2*x^5+1/10*c*d^2*b^2*arctan(c*x)*x^4-1/2*I/c^3*d^2*b^2*arcta
n(c*x)^2-4/15*I/c^3*d^2*b^2*dilog(-1/2*I*(I+c*x))+2/15*I/c^3*d^2*b^2*ln(I+c
*x)^2-2/15*I/c^3*d^2*b^2*ln(c*x-I)^2-1/5*c^2*d^2*a^2*x^5-1/30*b^2*d^2*x^3-1
/3*I*d^2*a*b*x^3-19/30*b^2*d^2*arctan(c*x)/c^3+1/3*d^2*b^2*arctan(c*x)^2*x^
3-2/5*c^2*d^2*a*b*arctan(c*x)*x^5
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{5}\,a^2c^2d^2x^5+\frac{1}{2}i\,a^2cd^2x^4-\frac{1}{10}\left(4\,x^5\arctan(cx)-c\left(\frac{c^2x^4-2\,x^2}{c^4}+\frac{2\,\log\left(c^2x^2+1\right)}{c^6}\right)\right)abc^2d^2+\frac{1}{3}\,a^2d^2x^3+\frac{1}{3}i\left(3\,x^{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/5*a^2*c^2*d^2*x^5 + 1/2*I*a^2*c*d^2*x^4 - 1/10*(4*x^5*arctan(c*x) - c*((
c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*a*b*c^2*d^2 + 1/3*a^2*d^2*x
^3 + 1/3*I*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)
)*a*b*c*d^2 + 1/3*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*
a*b*d^2 - 1/480*(24*b^2*c^2*d^2*x^5 - 60*I*b^2*c*d^2*x^4 - 40*b^2*d^2*x^3)*
arctan(c*x)^2 - 1/480*(24*I*b^2*c^2*d^2*x^5 + 60*b^2*c*d^2*x^4 - 40*I*b^2*d
^2*x^3)*arctan(c*x)*log(c^2*x^2 + 1) + 1/480*(6*b^2*c^2*d^2*x^5 - 15*I*b^2*
c*d^2*x^4 - 10*b^2*d^2*x^3)*log(c^2*x^2 + 1)^2 - integrate(1/240*(180*(b^2*
c^4*d^2*x^6 - b^2*d^2*x^2)*arctan(c*x)^2 + 15*(b^2*c^4*d^2*x^6 - b^2*d^2*x^
2)*log(c^2*x^2 + 1)^2 - 4*(21*b^2*c^3*d^2*x^5 - 10*b^2*c*d^2*x^3)*arctan(c*
x) + 2*(6*b^2*c^4*d^2*x^6 - 25*b^2*c^2*d^2*x^4 - 60*(b^2*c^3*d^2*x^5 + b^2*
c*d^2*x^3)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x) + I*integrate(1
/120*(180*(b^2*c^3*d^2*x^5 + b^2*c*d^2*x^3)*arctan(c*x)^2 + 15*(b^2*c^3*d^2
*x^5 + b^2*c*d^2*x^3)*log(c^2*x^2 + 1)^2 + 2*(6*b^2*c^4*d^2*x^6 - 25*b^2*c^
2*d^2*x^4)*arctan(c*x) + (21*b^2*c^3*d^2*x^5 - 10*b^2*c*d^2*x^3 + 30*(b^2*c
^4*d^2*x^6 - b^2*d^2*x^2)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2 (a + b\,\mathrm{atan}(c\,x))^2 (d + c\,d\,x\,1\mathrm{i})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))^2*(d + c*d*x*1i)^2,x)
```

```
[Out] int(x^2*(a + b*atan(c*x))^2*(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+I*c*d*x)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.78 $\int x(d+icdx)^2 \left(a+b\tan^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=293

$$-\frac{1}{4}c^2d^2x^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{17d^2\left(a+b\tan^{-1}(cx)\right)^2}{12c^2}-\frac{4ibd^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^2}+\frac{2}{3}icd^2x^3\left(a+b\tan\right.$$

```
[Out] -3/2*a*b*d^2*x/c+2/3*I*b^2*d^2*x/c-1/12*b^2*d^2*x^2-2/3*I*b^2*d^2*arctan(c*
x)/c^2-3/2*b^2*d^2*x*arctan(c*x)/c-2/3*I*b*d^2*x^2*(a+b*arctan(c*x))+1/6*b*
c*d^2*x^3*(a+b*arctan(c*x))+17/12*d^2*(a+b*arctan(c*x))^2/c^2+1/2*d^2*x^2*(
a+b*arctan(c*x))^2+2/3*I*c*d^2*x^3*(a+b*arctan(c*x))^2-1/4*c^2*d^2*x^4*(a+b
*arctan(c*x))^2-4/3*I*b*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^2+5/6*b^2*d
^2*ln(c^2*x^2+1)/c^2+2/3*b^2*d^2*polylog(2,1-2/(1+I*c*x))/c^2
```

Rubi [A] time = 0.62, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 14, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.609$, Rules used = {4876, 4852, 4916, 4846, 260, 4884, 321, 203, 4920, 4854, 2402, 2315, 266, 43}

$$\frac{2b^2d^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^2}-\frac{1}{4}c^2d^2x^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{17d^2\left(a+b\tan^{-1}(cx)\right)^2}{12c^2}-\frac{4ibd^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan\right.}{3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (-3*a*b*d^2*x)/(2*c) + (((2*I)/3)*b^2*d^2*x)/c - (b^2*d^2*x^2)/12 - (((2*I)
/3)*b^2*d^2*ArcTan[c*x])/c^2 - (3*b^2*d^2*x*ArcTan[c*x])/(2*c) - ((2*I)/3)*
b*d^2*x^2*(a + b*ArcTan[c*x]) + (b*c*d^2*x^3*(a + b*ArcTan[c*x]))/6 + (17*d
^2*(a + b*ArcTan[c*x])^2)/(12*c^2) + (d^2*x^2*(a + b*ArcTan[c*x])^2)/2 + ((
2*I)/3)*c*d^2*x^3*(a + b*ArcTan[c*x])^2 - (c^2*d^2*x^4*(a + b*ArcTan[c*x])^
2)/4 - (((4*I)/3)*b*d^2*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c^2 + (5*b^
2*d^2*Log[1 + c^2*x^2])/(6*c^2) + (2*b^2*d^2*PolyLog[2, 1 - 2/(1 + I*c*x)])
/(3*c^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(d^2x\left(a+b\tan^{-1}(cx)\right)^2+2icd^2x^2\left(a+b\tan^{-1}(cx)\right)^2-c^2d^2x^3\left(a+b\right.\right.$$

$$=d^2\int x\left(a+b\tan^{-1}(cx)\right)^2\,dx+\left(2icd^2\right)\int x^2\left(a+b\tan^{-1}(cx)\right)^2\,dx-($$

$$=\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{2}{3}icd^2x^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{4}c^2d^2x^4\left(a+\right.$$

$$=\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{2}{3}icd^2x^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{4}c^2d^2x^4\left(a+\right.$$

$$=-\frac{abd^2x}{c}-\frac{2}{3}ibd^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}bcd^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{7a}{}$$

$$=-\frac{3abd^2x}{2c}+\frac{2ib^2d^2x}{3c}-\frac{b^2d^2x\tan^{-1}(cx)}{c}-\frac{2}{3}ibd^2x^2\left(a+b\tan^{-1}(cx)\right)+$$

$$=-\frac{3abd^2x}{2c}+\frac{2ib^2d^2x}{3c}-\frac{2ib^2d^2\tan^{-1}(cx)}{3c^2}-\frac{3b^2d^2x\tan^{-1}(cx)}{2c}-\frac{2}{3}ibd^2x^2$$

$$=-\frac{3abd^2x}{2c}+\frac{2ib^2d^2x}{3c}-\frac{1}{12}b^2d^2x^2-\frac{2ib^2d^2\tan^{-1}(cx)}{3c^2}-\frac{3b^2d^2x\tan^{-1}(cx}{2c}$$

Mathematica [A] time = 0.82, size = 257, normalized size = 0.88

$$-\frac{d^2\left(3a^2c^4x^4-8ia^2c^3x^3-6a^2c^2x^2-2abc^3x^3+8iabc^2x^2-8iab\log\left(c^2x^2+1\right)+2b\tan^{-1}(cx)\left(a\left(3c^4x^4-8ic^3x\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] -1/12*(d^2*(b^2 + 18*a*b*c*x - (8*I)*b^2*c*x - 6*a^2*c^2*x^2 + (8*I)*a*b*c^
2*x^2 + b^2*c^2*x^2 - (8*I)*a^2*c^3*x^3 - 2*a*b*c^3*x^3 + 3*a^2*c^4*x^4 + b
^2*(-I + c*x)^3*(I + 3*c*x)*ArcTan[c*x]^2 + 2*b*ArcTan[c*x]*(b*(4*I + 9*c*x
 + (4*I)*c^2*x^2 - c^3*x^3) + a*(-9 - 6*c^2*x^2 - (8*I)*c^3*x^3 + 3*c^4*x^4
) + (8*I)*b*Log[1 + E^((2*I)*ArcTan[c*x])]) - (8*I)*a*b*Log[1 + c^2*x^2] -
10*b^2*Log[1 + c^2*x^2] + 8*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/c^2
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\frac{1}{48}\left(3\,b^2c^2d^2x^4-8i\,b^2cd^2x^3-6\,b^2d^2x^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(-\frac{12\,a^2c^4d^2x^5-24i\,a^2c^3d^2x^4-24i\,a^2cd^2x^2}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/48*(3*b^2*c^2*d^2*x^4 - 8*I*b^2*c*d^2*x^3 - 6*b^2*d^2*x^2)*log(-(c*x + I)
/(c*x - I))^2 + integral(-1/12*(12*a^2*c^4*d^2*x^5 - 24*I*a^2*c^3*d^2*x^4 -
 24*I*a^2*c*d^2*x^2 - 12*a^2*d^2*x - (-12*I*a*b*c^4*d^2*x^5 - (24*a*b - 3*I
*b^2)*c^3*d^2*x^4 + 8*b^2*c^2*d^2*x^3 - (24*a*b + 6*I*b^2)*c*d^2*x^2 + 12*I
*a*b*d^2*x)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 556, normalized size = 1.90

$$\frac{d^2b^2\arctan(cx)^2x^2}{2}-\frac{c^2d^2a^2x^4}{4}+\frac{3d^2b^2\arctan(cx)^2}{4c^2}+\frac{2id^2ab\ln\left(c^2x^2+1\right)}{3c^2}+\frac{2icd^2b^2\arctan(cx)^2x^3}{3}+\frac{2id^2b^2\arcta}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/6/c^2*d^2*b^2*ln(c*x-I)^2+1/2*d^2*b^2*arctan(c*x)^2*x^2-1/4*c^2*d^2*a^2*x
^4-1/3/c^2*d^2*b^2*dilog(1/2*I*(c*x-I))+1/3/c^2*d^2*b^2*dilog(-1/2*I*(I+c*x
))+3/4/c^2*d^2*b^2*arctan(c*x)^2-1/6/c^2*d^2*b^2*ln(I+c*x)^2-3/2*a*b*d^2*x/
c-3/2*b^2*d^2*x*arctan(c*x)/c-2/3*I*b^2*d^2*arctan(c*x)/c^2+2/3*I*b^2*d^2*x
/c+5/6*b^2*d^2*ln(c^2*x^2+1)/c^2-1/2*c^2*d^2*a*b*arctan(c*x)*x^4+2/3*I*c*d^
2*b^2*arctan(c*x)^2*x^3+2/3*I/c^2*d^2*b^2*arctan(c*x)*ln(c^2*x^2+1)+2/3*I/c
^2*d^2*a*b*ln(c^2*x^2+1)+1/6*c*d^2*a*b*x^3-2/3*I*d^2*a*b*x^2-1/4*c^2*d^2*b^
2*arctan(c*x)^2*x^4+d^2*a*b*arctan(c*x)*x^2+1/3/c^2*d^2*b^2*ln(c*x-I)*ln(-1
/2*I*(I+c*x))+1/3/c^2*d^2*b^2*ln(I+c*x)*ln(c^2*x^2+1)+3/2/c^2*d^2*a*b*arcta
n(c*x)+1/6*c*d^2*b^2*arctan(c*x)*x^3-1/3/c^2*d^2*b^2*ln(c*x-I)*ln(c^2*x^2+1
)-1/3/c^2*d^2*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))-2/3*I*d^2*b^2*arctan(c*x)*x^2
+2/3*I*c*d^2*a^2*x^3-1/12*b^2*d^2*x^2+1/2*d^2*a^2*x^2+4/3*I*c*d^2*a*b*arcta
n(c*x)*x^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{4}a^2c^2d^2x^4+\frac{2}{3}ia^2cd^2x^3+\frac{1}{2}b^2d^2x^2\arctan(cx)^2-\frac{1}{6}\left(3x^4\arctan(cx)-c\left(\frac{c^2x^3-3x}{c^4}+\frac{3\arctan(cx)}{c^5}\right)\right)abc^2d^2+\frac{2}{3}i$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/4*a^2*c^2*d^2*x^4 + 2/3*I*a^2*c*d^2*x^3 + 1/2*b^2*d^2*x^2*arctan(c*x)^2
- 1/6*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*b
*c^2*d^2 + 2/3*I*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a
*b*c*d^2 + 1/2*a^2*d^2*x^2 + (x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3)
)*a*b*d^2 - 1/2*(2*c*(x/c^2 - arctan(c*x)/c^3)*arctan(c*x) + (arctan(c*x)^2
 - log(c^2*x^2 + 1))/c^2)*b^2*d^2 - 1/192*(12*b^2*c^2*d^2*x^4 - 32*I*b^2*c*
d^2*x^3)*arctan(c*x)^2 + 1/48*(-3*I*b^2*c^2*d^2*x^4 - 8*b^2*c*d^2*x^3)*arct
an(c*x)*log(c^2*x^2 + 1) + 1/192*(3*b^2*c^2*d^2*x^4 - 8*I*b^2*c*d^2*x^3)*lo
g(c^2*x^2 + 1)^2 - integrate(-1/48*(22*b^2*c^3*d^2*x^4*arctan(c*x) - 36*(b^
2*c^4*d^2*x^5 + b^2*c^2*d^2*x^3)*arctan(c*x)^2 - 3*(b^2*c^4*d^2*x^5 + b^2*c
^2*d^2*x^3)*log(c^2*x^2 + 1)^2 - (3*b^2*c^4*d^2*x^5 - 8*b^2*c^2*d^2*x^3 - 2
4*(b^2*c^3*d^2*x^4 + b^2*c*d^2*x^2)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2
 + 1), x) + I*integrate(1/48*(72*(b^2*c^3*d^2*x^4 + b^2*c*d^2*x^2)*arctan(c
```

```
*x)^2 + 6*(b^2*c^3*d^2*x^4 + b^2*c*d^2*x^2)*log(c^2*x^2 + 1)^2 + 2*(3*b^2*c
^4*d^2*x^5 - 8*b^2*c^2*d^2*x^3)*arctan(c*x) + (11*b^2*c^3*d^2*x^4 + 12*(b^2
*c^4*d^2*x^5 + b^2*c^2*d^2*x^3)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1
), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))^2*(d + c*d*x*1i)^2,x)
```

```
[Out] int(x*(a + b*atan(c*x))^2*(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.79 $\int (d+icdx)^2 \left(a+b\tan^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=192

$$\frac{1}{3}bcd^2x^2\left(a+b\tan^{-1}(cx)\right)-\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)^2}{3c}+\frac{8bd^2\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c}-2iabd^2x+\frac{ib^2d^2\,\mathrm{lo}}{}$$

[Out] -2*I*a*b*d^2*x-1/3*b^2*d^2*x+1/3*b^2*d^2*arctan(c*x)/c-2*I*b^2*d^2*x*arctan(c*x)+1/3*b*c*d^2*x^2*(a+b*arctan(c*x))-1/3*I*d^2*(1+I*c*x)^3*(a+b*arctan(c*x))^2/c+8/3*b*d^2*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/c+I*b^2*d^2*ln(c^2*x^2+1)/c-4/3*I*b^2*d^2*polylog(2,1-2/(1-I*c*x))/c

Rubi [A] time = 0.20, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4864, 4846, 260, 4852, 321, 203, 1586, 4854, 2402, 2315}

$$-\frac{4ib^2d^2\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{3c}+\frac{1}{3}bcd^2x^2\left(a+b\tan^{-1}(cx)\right)-\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)^2}{3c}+\frac{8bd^2\log\left(\frac{2}{1-icx}\right)\left(a-\right.}{3c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (-2*I)*a*b*d^2*x - (b^2*d^2*x)/3 + (b^2*d^2*ArcTan[c*x])/(3*c) - (2*I)*b^2*d^2*x*ArcTan[c*x] + (b*c*d^2*x^2*(a + b*ArcTan[c*x]))/3 - ((I/3)*d^2*(1 + I*c*x)^3*(a + b*ArcTan[c*x])^2)/c + (8*b*d^2*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/(3*c) + (I*b^2*d^2*Log[1 + c^2*x^2])/c - (((4*I)/3)*b^2*d^2*PolyLog[2, 1 - 2/(1 - I*c*x)])/c
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveContent[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] :> Int[u*PolynomialQuotient[Px, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] && EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 - c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rubi steps

$$\int (d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx = -\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)^2}{3c}+\frac{(2ib)\int\left(-3d^3\left(a+b\tan^{-1}(cx)\right)-ic\right.}{}$$

$$= -\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)^2}{3c}+\frac{(8b)\int\frac{\left(id^3-cd^3x\right)\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}\,dx}{3d}-\left(2\right.$$

$$= -2iabd^2x+\frac{1}{3}bcd^2x^2\left(a+b\tan^{-1}(cx)\right)-\frac{id^2(1+icx)^3\left(a+b\tan^{-1}(cx)\right)^2}{3c}$$

$$= -2iabd^2x-\frac{1}{3}b^2d^2x-2ib^2d^2x\tan^{-1}(cx)+\frac{1}{3}bcd^2x^2\left(a+b\tan^{-1}(cx)\right)-$$

$$= -2iabd^2x-\frac{1}{3}b^2d^2x+\frac{b^2d^2\tan^{-1}(cx)}{3c}-2ib^2d^2x\tan^{-1}(cx)+\frac{1}{3}bcd^2x^2\left(a\right.$$

$$= -2iabd^2x-\frac{1}{3}b^2d^2x+\frac{b^2d^2\tan^{-1}(cx)}{3c}-2ib^2d^2x\tan^{-1}(cx)+\frac{1}{3}bcd^2x^2\left(a\right.$$

Mathematica [A] time = 0.67, size = 205, normalized size = 1.07

$$-\frac{d^2\left(a^2c^3x^3-3ia^2c^2x^2-3a^2cx-abc^2x^2+4ab\log\left(c^2x^2+1\right)-b\tan^{-1}(cx)\left(a\left(-2c^3x^3+6ic^2x^2+6cx+6i\right)+b\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] -1/3*(d^2*(-3*a^2*c*x + (6*I)*a*b*c*x + b^2*c*x - (3*I)*a^2*c^2*x^2 - a*b*c
^2*x^2 + a^2*c^3*x^3 + b^2*(-I + c*x)^3*ArcTan[c*x]^2 - b*ArcTan[c*x]*(b*(1
 - (6*I)*c*x + c^2*x^2) + a*(6*I + 6*c*x + (6*I)*c^2*x^2 - 2*c^3*x^3) + 8*b
*Log[1 + E^((2*I)*ArcTan[c*x])]) + 4*a*b*Log[1 + c^2*x^2] - (3*I)*b^2*Log[1
 + c^2*x^2] + (4*I)*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/c
```

fricas [F] time = 1.38, size = 0, normalized size = 0.00

$$\frac{1}{12}\left(b^2c^2d^2x^3-3i\,b^2cd^2x^2-3\,b^2d^2x\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(-\frac{3\,a^2c^4d^2x^4-6i\,a^2c^3d^2x^3-6i\,a^2cd^2x-3\,a^2d^2-}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/12*(b^2*c^2*d^2*x^3 - 3*I*b^2*c*d^2*x^2 - 3*b^2*d^2*x)*log(-(c*x + I)/(c*
x - I))^2 + integral(-1/3*(3*a^2*c^4*d^2*x^4 - 6*I*a^2*c^3*d^2*x^3 - 6*I*a^
2*c*d^2*x - 3*a^2*d^2 - (-3*I*a*b*c^4*d^2*x^4 - (6*a*b - I*b^2)*c^3*d^2*x^3
 + 3*b^2*c^2*d^2*x^2 - (6*a*b + 3*I*b^2)*c*d^2*x + 3*I*a*b*d^2)*log(-(c*x +
 I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 523, normalized size = 2.72

$$-\frac{id^2a^2}{3c}-\frac{c^2d^2a^2x^3}{3}+a^2x\,d^2+\frac{ib^2\ln\left(cx-i\right)^2d^2}{3c}-\frac{2ib^2\,\text{dilog}\left(\frac{i(cx-i)}{2}\right)d^2}{3c}+\frac{2ib^2\,\text{dilog}\left(-\frac{i(cx+i)}{2}\right)d^2}{3c}-\frac{4b^2\arctan\left(cx\right)\ln\left(\right.}{3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] -1/3*c^2*d^2*a^2*x^3-1/3*I/c*d^2*a^2+a^2*x*d^2-4/3/c*b^2*arctan(c*x)*ln(c^2
*x^2+1)*d^2+2*a*b*arctan(c*x)*x*d^2-4/3/c*a*b*ln(c^2*x^2+1)*d^2+b^2*arctan(
c*x)^2*x*d^2-2*I*a*b*d^2*x-2*I*b^2*d^2*x*arctan(c*x)+I*b^2*d^2*ln(c^2*x^2+1
)/c+2*I*c*d^2*a*b*arctan(c*x)*x^2+1/3*b^2*d^2*arctan(c*x)/c-2/3*c^2*d^2*a*b
*arctan(c*x)*x^3+2/3*I/c*d^2*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+I*c*d^2*b^2*a
rctan(c*x)^2*x^2+2/3*I/c*d^2*b^2*ln(I+c*x)*ln(c^2*x^2+1)-2/3*I/c*d^2*b^2*ln
(c*x-I)*ln(c^2*x^2+1)-2/3*I/c*d^2*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))+2*I/c*d^2
*a*b*arctan(c*x)+2/3*I/c*d^2*b^2*dilog(-1/2*I*(I+c*x))+1/3*c*d^2*a*b*x^2+1/
3*I/c*d^2*b^2*ln(c*x-I)^2+I/c*d^2*b^2*arctan(c*x)^2+I*c*x^2*a^2*d^2+1/3*c*d
^2*b^2*arctan(c*x)*x^2-1/3*c^2*d^2*b^2*arctan(c*x)^2*x^3-2/3*I/c*d^2*b^2*di
log(1/2*I*(c*x-I))-1/3*I/c*d^2*b^2*ln(I+c*x)^2-1/3*b^2*d^2*x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}a^2c^2d^2x^3-36\,b^2c^4d^2\int\frac{x^4\arctan\left(cx\right)^2}{48\left(c^2x^2+1\right)}\,dx-3\,b^2c^4d^2\int\frac{x^4\log\left(c^2x^2+1\right)^2}{48\left(c^2x^2+1\right)}\,dx-4\,b^2c^4d^2\int\frac{x^4\log\left(c^2x^2+1\right)}{48\left(c^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/3*a^2*c^2*d^2*x^3 - 36*b^2*c^4*d^2*integrate(1/48*x^4*arctan(c*x)^2/(c^2
*x^2 + 1), x) - 3*b^2*c^4*d^2*integrate(1/48*x^4*log(c^2*x^2 + 1)^2/(c^2*x^
2 + 1), x) - 4*b^2*c^4*d^2*integrate(1/48*x^4*log(c^2*x^2 + 1)/(c^2*x^2 + 1
), x) + 24*b^2*c^3*d^2*integrate(1/48*x^3*arctan(c*x)*log(c^2*x^2 + 1)/(c^2
*x^2 + 1), x) + 32*b^2*c^3*d^2*integrate(1/48*x^3*arctan(c*x)/(c^2*x^2 + 1)
, x) - 1/3*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a*b*c^2
*d^2 + I*a^2*c*d^2*x^2 + 24*b^2*c^2*d^2*integrate(1/48*x^2*log(c^2*x^2 + 1)
/(c^2*x^2 + 1), x) + 2*I*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a*
b*c*d^2 + 1/4*b^2*d^2*arctan(c*x)^3/c + 24*b^2*c*d^2*integrate(1/48*x*arcta
n(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) - 24*b^2*c*d^2*integrate(1/48*x*a
rctan(c*x)/(c^2*x^2 + 1), x) + a^2*d^2*x + 3*b^2*d^2*integrate(1/48*log(c^2
*x^2 + 1)^2/(c^2*x^2 + 1), x) + (2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*a*b*
d^2/c - 1/48*(4*b^2*c^2*d^2*x^3 - 12*I*b^2*c*d^2*x^2 - 12*b^2*d^2*x)*arctan
(c*x)^2 - 1/48*(4*I*b^2*c^2*d^2*x^3 + 12*b^2*c*d^2*x^2 - 12*I*b^2*d^2*x)*ar
ctan(c*x)*log(c^2*x^2 + 1) + 1/48*(b^2*c^2*d^2*x^3 - 3*I*b^2*c*d^2*x^2 - 3*
b^2*d^2*x)*log(c^2*x^2 + 1)^2 + I*integrate(1/24*(36*(b^2*c^3*d^2*x^3 + b^2
*c*d^2*x)*arctan(c*x)^2 + 3*(b^2*c^3*d^2*x^3 + b^2*c*d^2*x)*log(c^2*x^2 + 1
)^2 + 4*(b^2*c^4*d^2*x^4 - 6*b^2*c^2*d^2*x^2)*arctan(c*x) + 2*(4*b^2*c^3*d^
2*x^3 - 3*b^2*c*d^2*x + 3*(b^2*c^4*d^2*x^4 - b^2*d^2)*arctan(c*x))*log(c^2*
x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int (a+b\,\mathrm{atan}\left(c\,x\right))^2\,(d+c\,d\,x\,1\mathrm{i})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2*(d + c*d*x*1i)^2,x)
```

```
[Out] int((a + b*atan(c*x))^2*(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.80 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx$

Optimal. Leaf size=300

$$-\frac{1}{2}c^2d^2x^2\left(a+b\tan^{-1}(cx)\right)^2-ibd^2\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)+ibd^2\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)+ab$$

```
[Out] a*b*c*d^2*x+b^2*c*d^2*x*arctan(c*x)-5/2*d^2*(a+b*arctan(c*x))^2+2*I*c*d^2*x
*(a+b*arctan(c*x))^2-1/2*c^2*d^2*x^2*(a+b*arctan(c*x))^2-2*d^2*(a+b*arctan(
c*x))^2*arctanh(-1+2/(1+I*c*x))+4*I*b*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))
-1/2*b^2*d^2*ln(c^2*x^2+1)-2*b^2*d^2*polylog(2,1-2/(1+I*c*x))-I*b*d^2*(a+b*
arctan(c*x))*polylog(2,1-2/(1+I*c*x))+I*b*d^2*(a+b*arctan(c*x))*polylog(2,-
1+2/(1+I*c*x))-1/2*b^2*d^2*polylog(3,1-2/(1+I*c*x))+1/2*b^2*d^2*polylog(3,-
1+2/(1+I*c*x))
```

Rubi [A] time = 0.58, antiderivative size = 300, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.560, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4850, 4988, 4884, 4994, 6610, 4852, 4916, 260}

$$-ibd^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+ibd^2\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-2b^2d^2\text{PolyLo}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] a*b*c*d^2*x + b^2*c*d^2*x*ArcTan[c*x] - (5*d^2*(a + b*ArcTan[c*x])^2)/2 + (
2*I)*c*d^2*x*(a + b*ArcTan[c*x])^2 - (c^2*d^2*x^2*(a + b*ArcTan[c*x])^2)/2
+ 2*d^2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + (4*I)*b*d^2*(a +
 b*ArcTan[c*x])*Log[2/(1 + I*c*x)] - (b^2*d^2*Log[1 + c^2*x^2])/2 - 2*b^2*d
^2*PolyLog[2, 1 - 2/(1 + I*c*x)] - I*b*d^2*(a + b*ArcTan[c*x])*PolyLog[2, 1
 - 2/(1 + I*c*x)] + I*b*d^2*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*
x)] - (b^2*d^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/2 + (b^2*d^2*PolyLog[3, -1 +
2/(1 + I*c*x)])/2
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
```

```
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2}{x}dx = \int \left(2icd^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}-c^2d^2x\left(a+b\tan^{-1}(c\right.\right.$$

$$= d^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}dx+\left(2icd^2\right)\int \left(a+b\tan^{-1}(cx)\right)^2dx-\left(c^2d^2\right)\int$$

$$= 2icd^2x\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}c^2d^2x^2\left(a+b\tan^{-1}(cx)\right)^2+2d^2\left(a+b\tan^{-1}(\right.$$

$$= -2d^2\left(a+b\tan^{-1}(cx)\right)^2+2icd^2x\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}c^2d^2x^2\left(a+b\tan^{-1}\right.$$

$$= abcd^2x-\frac{5}{2}d^2\left(a+b\tan^{-1}(cx)\right)^2+2icd^2x\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}c^2d^2x^2\left(a\right.$$

$$= abcd^2x+b^2cd^2x\tan^{-1}(cx)-\frac{5}{2}d^2\left(a+b\tan^{-1}(cx)\right)^2+2icd^2x\left(a+b\tan^{-1}(\right.$$

$$= abcd^2x+b^2cd^2x\tan^{-1}(cx)-\frac{5}{2}d^2\left(a+b\tan^{-1}(cx)\right)^2+2icd^2x\left(a+b\tan^{-1}(\right.$$

Mathematica [A] time = 0.66, size = 360, normalized size = 1.20

$$\frac{1}{2}d^2\left(a^2\left(-c^2\right)x^2+4ia^2cx+2a^2\log(cx)-2ab\left(\left(c^2x^2+1\right)\tan^{-1}(cx)-cx\right)+4iab\left(2cx\tan^{-1}(cx)-\log\left(c^2x^2+1\right)\right)\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] (d^2*((4*I)*a^2*c*x - a^2*c^2*x^2 + 2*b^2*c*x*ArcTan[c*x] - b^2*(1 + c^2*x^
2)*ArcTan[c*x]^2 - 2*a*b*(-(c*x) + (1 + c^2*x^2)*ArcTan[c*x]) + 2*a^2*Log[c
*x] + (4*I)*a*b*(2*c*x*ArcTan[c*x] - Log[1 + c^2*x^2]) - b^2*Log[1 + c^2*x^
2] + 4*b^2*(ArcTan[c*x]*((1 + I*c*x)*ArcTan[c*x] + (2*I)*Log[1 + E^((2*I)*A
rcTan[c*x])]) + PolyLog[2, -E^((2*I)*ArcTan[c*x])]) + (2*I)*a*b*(PolyLog[2,
 (-I)*c*x] - PolyLog[2, I*c*x]) + 2*b^2*((-1/24*I)*Pi^3 + ((2*I)/3)*ArcTan[
c*x]^3 + ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - ArcTan[c*x]^2*Log[
1 + E^((2*I)*ArcTan[c*x])] + I*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x]
)] + I*ArcTan[c*x]*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + PolyLog[3, E^((-2*I
)*ArcTan[c*x])]/2 - PolyLog[3, -E^((2*I)*ArcTan[c*x])]/2)))/2
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(-\frac{4a^2c^2d^2x^2-8ia^2cd^2x-4a^2d^2-\left(b^2c^2d^2x^2-2ib^2cd^2x-b^2d^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2-\left(-4iabc^2d^2x^2-8abcd\right.}{4x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(-1/4*(4*a^2*c^2*d^2*x^2 - 8*I*a^2*c*d^2*x - 4*a^2*d^2 - (b^2*c^2*d
^2*x^2 - 2*I*b^2*c*d^2*x - b^2*d^2)*log(-(c*x + I)/(c*x - I))^2 - (-4*I*a*b
*c^2*d^2*x^2 - 8*a*b*c*d^2*x + 4*I*a*b*d^2)*log(-(c*x + I)/(c*x - I)))/x, x
)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 3.66, size = 1542, normalized size = 5.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x,x)
```

```
[Out] d^2*b^2*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+d^2*b^2*arctan(c*x)
^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+d^2*b^2*arctan(c*x)^2*ln(c*x)-d^2*b^2*
arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+a*b*c*d^2*x+b^2*c*d^2*x*arctan(
c*x)-1/2*d^2*b^2*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+4*d^2*b^2*dilog(1+I*(1
+I*c*x)/(c^2*x^2+1)^(1/2))+4*d^2*b^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))
+2*d^2*b^2*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*d^2*b^2*polylog(3,-(1+I
*c*x)/(c^2*x^2+1)^(1/2))+d^2*b^2*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+d^2*a^2*ln(c
*x)+3/2*d^2*b^2*arctan(c*x)^2-1/2*d^2*a^2*c^2*x^2-d^2*a*b*arctan(c*x)+4*I*d
^2*a*b*arctan(c*x)*c*x-1/2*I*d^2*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/
((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/
(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*d^2*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x
^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2
*arctan(c*x)^2-1/2*I*d^2*b^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*
((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-I*
d^2*b^2*arctan(c*x)+I*d^2*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1
))+4*I*d^2*b^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*d^2*b^2*
arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+I*d^2*a*b*dilog(1+I*c*x
)+2*d^2*a*b*arctan(c*x)*ln(c*x)-I*d^2*a*b*dilog(1-I*c*x)-2*I*d^2*a*b*ln(c^2
*x^2+1)+2*I*d^2*a^2*c*x-2*I*d^2*b^2*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^
2+1)^(1/2))+4*I*d^2*b^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2
*I*d^2*b^2*Pi*arctan(c*x)^2-1/2*d^2*b^2*arctan(c*x)^2*c^2*x^2+1/2*I*d^2*b^2
*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))
*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x
)^2+2*I*d^2*b^2*arctan(c*x)^2*c*x-1/2*I*d^2*b^2*Pi*csgn(((1+I*c*x)^2/(c^2*x
^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*d^2*b^2*Pi*csgn
(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+1
/2*I*d^2*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))^3*arctan(c*x)^2+I*d^2*a*b*ln(c*x)*ln(1+I*c*x)-I*d^2*a*b*ln(c*x)*ln(1-I
*c*x)-d^2*a*b*arctan(c*x)*c^2*x^2+1/2*I*d^2*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2
*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((
1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-12\,b^2c^4d^2\int \frac{x^4\arctan(cx)^2}{16\left(c^2x^3+x\right)}\,dx+2i\,b^2c^4d^2\int \frac{x^4\arctan(cx)\log\left(c^2x^2+1\right)}{8\left(c^2x^3+x\right)}\,dx-b^2c^4d^2\int \frac{x^4\log\left(c^2x^2+1\right)^2}{16\left(c^2x^3+x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -12*b^2*c^4*d^2*integrate(1/16*x^4*arctan(c*x)^2/(c^2*x^3 + x), x) + 2*I*b^
2*c^4*d^2*integrate(1/8*x^4*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3 + x), x)
- b^2*c^4*d^2*integrate(1/16*x^4*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 2*I
*b^2*c^4*d^2*integrate(1/8*x^4*arctan(c*x)/(c^2*x^3 + x), x) - 32*a*b*c^4*d
^2*integrate(1/16*x^4*arctan(c*x)/(c^2*x^3 + x), x) - 2*b^2*c^4*d^2*integra
te(1/16*x^4*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) - 1/2*a^2*c^2*d^2*x^2 + 12*I
*b^2*c^3*d^2*integrate(1/8*x^3*arctan(c*x)^2/(c^2*x^3 + x), x) + 8*b^2*c^3*
d^2*integrate(1/16*x^3*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + I*b
^2*c^3*d^2*integrate(1/8*x^3*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 20*b^2*
c^3*d^2*integrate(1/16*x^3*arctan(c*x)/(c^2*x^3 + x), x) + 5*I*b^2*c^3*d^2*
integrate(1/8*x^3*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + 1/2*I*b^2*d^2*arctan
(c*x)^3 - 8*I*b^2*c^2*d^2*integrate(1/8*x^2*arctan(c*x)/(c^2*x^3 + x), x) +
 2*I*a^2*c*d^2*x + 8*b^2*c*d^2*integrate(1/16*x*arctan(c*x)*log(c^2*x^2 + 1
)/(c^2*x^3 + x), x) + I*b^2*c*d^2*integrate(1/8*x*log(c^2*x^2 + 1)^2/(c^2*x
^3 + x), x) + 1/8*b^2*d^2*log(c^2*x^2 + 1)^2 + 2*I*(2*c*x*arctan(c*x) - log
(c^2*x^2 + 1))*a*b*d^2 + 12*b^2*d^2*integrate(1/16*arctan(c*x)^2/(c^2*x^3 +
 x), x) - 2*I*b^2*d^2*integrate(1/8*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3 +
 x), x) + b^2*d^2*integrate(1/16*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 32*
a*b*d^2*integrate(1/16*arctan(c*x)/(c^2*x^3 + x), x) + a^2*d^2*log(x) - 1/3
2*(4*b^2*c^2*d^2*x^2 - 16*I*b^2*c*d^2*x)*arctan(c*x)^2 + 1/8*(-I*b^2*c^2*d^
2*x^2 - 4*b^2*c*d^2*x)*arctan(c*x)*log(c^2*x^2 + 1) + 1/32*(b^2*c^2*d^2*x^2
 - 4*I*b^2*c*d^2*x)*log(c^2*x^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-d^{2}\left(\int\left(-\frac{a^{2}}{x}\right)\,dx+\int\left(-2ia^{2}c\right)\,dx+\int a^{2}c^{2}x\,dx+\int\left(-\frac{b^{2}\operatorname{atan}^{2}{\left(cx\right)}}{x}\right)\,dx+\int\left(-2ib^{2}c\operatorname{atan}^{2}{\left(cx\right)}\right)\,dx+\int\left(-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))**2/x,x)
```

```
[Out] -d**2*(Integral(-a**2/x, x) + Integral(-2*I*a**2*c, x) + Integral(a**2*c**2
*x, x) + Integral(-b**2*atan(c*x)**2/x, x) + Integral(-2*I*b**2*c*atan(c*x)
**2, x) + Integral(-2*a*b*atan(c*x)/x, x) + Integral(b**2*c**2*x*atan(c*x)*
*2, x) + Integral(-4*I*a*b*c*atan(c*x), x) + Integral(2*a*b*c**2*x*atan(c*x
), x))
```

3.81 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=317

$$-c^2d^2x\left(a+b\tan^{-1}(cx)\right)^2+2bcd^2\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)-2bcd^2\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)-$$

```
[Out] -2*I*c*d^2*(a+b*arctan(c*x))^2-d^2*(a+b*arctan(c*x))^2/x-c^2*d^2*x*(a+b*arc
tan(c*x))^2-4*I*c*d^2*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))-2*b*c*d^2
*(a+b*arctan(c*x))*ln(2/(1+I*c*x))+2*b*c*d^2*(a+b*arctan(c*x))*ln(2-2/(1-I*
c*x))-I*b^2*c*d^2*polylog(2,-1+2/(1-I*c*x))-I*b^2*c*d^2*polylog(2,1-2/(1+I*
c*x))+2*b*c*d^2*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))-2*b*c*d^2*(a+b*a
rctan(c*x))*polylog(2,-1+2/(1+I*c*x))-I*b^2*c*d^2*polylog(3,1-2/(1+I*c*x))+
I*b^2*c*d^2*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.62, antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4924, 4868, 2447, 4850, 4988, 4884, 4994, 6610}

$$2bcd^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-2bcd^2\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-ib^2cd^2\text{Po}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] (-2*I)*c*d^2*(a + b*ArcTan[c*x])^2 - (d^2*(a + b*ArcTan[c*x])^2)/x - c^2*d^
2*x*(a + b*ArcTan[c*x])^2 + (4*I)*c*d^2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2
/(1 + I*c*x)] - 2*b*c*d^2*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)] + 2*b*c*d^
2*(a + b*ArcTan[c*x])*Log[2 - 2/(1 - I*c*x)] - I*b^2*c*d^2*PolyLog[2, -1 +
2/(1 - I*c*x)] - I*b^2*c*d^2*PolyLog[2, 1 - 2/(1 + I*c*x)] + 2*b*c*d^2*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] - 2*b*c*d^2*(a + b*ArcTan[c*x
])*PolyLog[2, -1 + 2/(1 + I*c*x)] - I*b^2*c*d^2*PolyLog[3, 1 - 2/(1 + I*c*x
)] + I*b^2*c*d^2*PolyLog[3, -1 + 2/(1 + I*c*x)]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx = \int\left(-c^2d^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x^2}+\frac{2icd^2\left(a+b\tan\right.}{x}\right.$$

$$= d^2\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx+\left(2icd^2\right)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx-\left(c^2d^2\right)$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}-c^2d^2x\left(a+b\tan^{-1}(cx)\right)^2+4icd^2\left(a+b\tan^{-1}(\right.$$

$$= -2icd^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}-c^2d^2x\left(a+b\tan^{-1}(\right.$$

$$= -2icd^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}-c^2d^2x\left(a+b\tan^{-1}(\right.$$

$$= -2icd^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}-c^2d^2x\left(a+b\tan^{-1}(\right.$$

$$= -2icd^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}-c^2d^2x\left(a+b\tan^{-1}(\right.$$

Mathematica [A] time = 0.68, size = 378, normalized size = 1.19

$$-\frac{d^2\left(12a^2c^2x^2-24ia^2cx\log(cx)+12a^2+24abc^2x^2\tan^{-1}(cx)+24abcx\text{Li}_2(-icx)-24abcx\text{Li}_2(icx)-24abcx\,\text{lo}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] -1/12*(d^2*(12*a^2 - b^2*c*Pi^3*x + 12*a^2*c^2*x^2 + 24*a*b*ArcTan[c*x] + 2
4*a*b*c^2*x^2*ArcTan[c*x] + 12*b^2*ArcTan[c*x]^2 + 12*b^2*c^2*x^2*ArcTan[c*
x]^2 + 16*b^2*c*x*ArcTan[c*x]^3 - (24*I)*b^2*c*x*ArcTan[c*x]^2*Log[1 - E^((
```

```
-2*I)*ArcTan[c*x])] - 24*b^2*c*x*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])]
 + 24*b^2*c*x*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + (24*I)*b^2*c*x*A
rcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] - (24*I)*a^2*c*x*Log[c*x] - 24*
a*b*c*x*Log[c*x] + 24*b^2*c*x*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])
] + 12*b^2*c*x*(-I + 2*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + (1
2*I)*b^2*c*x*PolyLog[2, E^((2*I)*ArcTan[c*x])] + 24*a*b*c*x*PolyLog[2, (-I)
*c*x] - 24*a*b*c*x*PolyLog[2, I*c*x] - (12*I)*b^2*c*x*PolyLog[3, E^((-2*I)*
ArcTan[c*x])] + (12*I)*b^2*c*x*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/x
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{4\,a^2c^2d^2x^2 - 8i\,a^2cd^2x - 4\,a^2d^2 - \left(b^2c^2d^2x^2 - 2i\,b^2cd^2x - b^2d^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2 - \left(-4i\,abc^2d^2x^2 - 8\,abcd\right.}{4\,x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(-1/4*(4*a^2*c^2*d^2*x^2 - 8*I*a^2*c*d^2*x - 4*a^2*d^2 - (b^2*c^2*d
^2*x^2 - 2*I*b^2*c*d^2*x - b^2*d^2)*log(-(c*x + I)/(c*x - I))^2 - (-4*I*a*b
*c^2*d^2*x^2 - 8*a*b*c*d^2*x + 4*I*a*b*d^2)*log(-(c*x + I)/(c*x - I)))/x^2,
 x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 2.58, size = 11959, normalized size = 37.73

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^2,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))**2/x**2,x)
```

```
[Out] Timed out
```

3.82 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx$

Optimal. Leaf size=337

$$ibc^2d^2\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)-ibc^2d^2\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)+\frac{3}{2}c^2d^2\left(a+b\tan^{-1}(cx)\right)^2+4i$$

```
[Out] -b*c*d^2*(a+b*arctan(c*x))/x+3/2*c^2*d^2*(a+b*arctan(c*x))^2-1/2*d^2*(a+b*a
rctan(c*x))^2/x^2-2*I*c*d^2*(a+b*arctan(c*x))^2/x+2*c^2*d^2*(a+b*arctan(c*x
))^2*arctanh(-1+2/(1+I*c*x))+b^2*c^2*d^2*ln(x)-1/2*b^2*c^2*d^2*ln(c^2*x^2+1
)+4*I*b*c^2*d^2*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))+2*b^2*c^2*d^2*polylog(2
,-1+2/(1-I*c*x))+I*b*c^2*d^2*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))-I*b
*c^2*d^2*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))+1/2*b^2*c^2*d^2*polylo
g(3,1-2/(1+I*c*x))-1/2*b^2*c^2*d^2*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.65, antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4876, 4852, 4918, 266, 36, 29, 31, 4884, 4924, 4868, 2447, 4850, 4988, 4994, 6610}

$$ibc^2d^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-ibc^2d^2\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+2b^2c^2d^2\text{Po}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*d^2*(a + b*ArcTan[c*x]))/x) + (3*c^2*d^2*(a + b*ArcTan[c*x])^2)/2 -
(d^2*(a + b*ArcTan[c*x])^2)/(2*x^2) - ((2*I)*c*d^2*(a + b*ArcTan[c*x])^2)/x
 - 2*c^2*d^2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + b^2*c^2*d^2
*Log[x] - (b^2*c^2*d^2*Log[1 + c^2*x^2])/2 + (4*I)*b*c^2*d^2*(a + b*ArcTan[
c*x])*Log[2 - 2/(1 - I*c*x)] + 2*b^2*c^2*d^2*PolyLog[2, -1 + 2/(1 - I*c*x)]
 + I*b*c^2*d^2*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] - I*b*c^2*
d^2*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)] + (b^2*c^2*d^2*PolyL
og[3, 1 - 2/(1 + I*c*x)])/2 - (b^2*c^2*d^2*PolyLog[3, -1 + 2/(1 + I*c*x)])/
2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx = \int\left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x^3}+\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)^2}{x^2}-\frac{c^2d^2\left(a+b\tan^{-1}(c\right.}{x}\right.$$

$$= d^2\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx+\left(2icd^2\right)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx-\left(c^2d^2\right)\int$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)^2}{x}-2c^2d^2\left(a+b\tan^{-1}(cx)\right.$$

$$= 2c^2d^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{2icd^2\left(a+b\tan^{-1}(cx)\right)^2}{x}$$

$$= -\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{3}{2}c^2d^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{3}{2}c^2d^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{3}{2}c^2d^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{3}{2}c^2d^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

Mathematica [A] time = 0.90, size = 388, normalized size = 1.15

$$-\frac{d^2\left(2a^2c^2x^2\log(x)+4ia^2cx+a^2+2iabc^2x^2(\text{Li}_2(-icx)-\text{Li}_2(icx))+4iabcx\left(cx\left(\log\left(c^2x^2+1\right)-2\log(cx)\right)+2\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -1/2*(d^2*(a^2 + (4*I)*a^2*c*x + 2*a*b*(ArcTan[c*x] + c*x*(1 + c*x*ArcTan[c
*x])) + 2*a^2*c^2*x^2*Log[x] + b^2*(2*c*x*ArcTan[c*x] + (1 + c^2*x^2)*ArcTa
n[c*x]^2 - 2*c^2*x^2*Log[(c*x)/Sqrt[1 + c^2*x^2]]) + (4*I)*a*b*c*x*(2*ArcTa
n[c*x] + c*x*(-2*Log[c*x] + Log[1 + c^2*x^2])) + (4*I)*b^2*c*x*(ArcTan[c*x]
^2 - 2*c*x*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + I*c*x*(ArcTan[c*x]^
2 + PolyLog[2, E^((2*I)*ArcTan[c*x])])) + (2*I)*a*b*c^2*x^2*(PolyLog[2, (-I
)*c*x] - PolyLog[2, I*c*x]) + (b^2*c^2*x^2*((-I)*Pi^3 + (16*I)*ArcTan[c*x]^
3 + 24*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 24*ArcTan[c*x]^2*Log
[1 + E^((2*I)*ArcTan[c*x])] + (24*I)*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTa
n[c*x])] + (24*I)*ArcTan[c*x]*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + 12*PolyL
og[3, E^((-2*I)*ArcTan[c*x])] - 12*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/12)
)/x^2
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{4\,a^2c^2d^2x^2-8i\,a^2cd^2x-4\,a^2d^2-\left(b^2c^2d^2x^2-2i\,b^2cd^2x-b^2d^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2-\left(-4i\,abc^2d^2x^2-8\,ab\right.}{4\,x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(-1/4*(4*a^2*c^2*d^2*x^2 - 8*I*a^2*c*d^2*x - 4*a^2*d^2 - (b^2*c^2*d
^2*x^2 - 2*I*b^2*c*d^2*x - b^2*d^2)*log(-(c*x + I)/(c*x - I))^2 - (-4*I*a*b
*c^2*d^2*x^2 - 8*a*b*c*d^2*x + 4*I*a*b*d^2)*log(-(c*x + I)/(c*x - I)))/x^3,
 x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 6.41, size = 1647, normalized size = 4.89

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^3,x)
```

```
[Out] -1/2*d^2*a^2/x^2-I*c^2*d^2*a*b*dilog(1+I*c*x)+4*I*c^2*d^2*a*b*ln(c*x)+4*I*c
^2*d^2*b^2*arctan(c*x)*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*c*d^2*b^2*arct
an(c*x)^2/x-I*c^2*d^2*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+2
*I*c^2*d^2*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I*c^2*
d^2*b^2*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))-I*c^2*d^2*b^2*ar
ctan(c*x)-2*I*c*d^2*a^2/x+I*c^2*d^2*a*b*ln(c*x)*ln(1-I*c*x)-2*I*c^2*d^2*a*b
*ln(c^2*x^2+1)-2*c^2*d^2*a*b*arctan(c*x)*ln(c*x)+I*c^2*d^2*a*b*dilog(1-I*c*
x)-1/2*I*c^2*d^2*b^2*arctan(c*x)^2*Pi-2*c^2*d^2*b^2*polylog(3,(1+I*c*x)/(c^
2*x^2+1)^(1/2))+3/2*c^2*d^2*b^2*arctan(c*x)^2-4*c^2*d^2*b^2*dilog((1+I*c*x)
/(c^2*x^2+1)^(1/2))+1/2*c^2*d^2*b^2*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+c^2
*d^2*b^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*d^2*b^2/x^2*arctan(c*x)^2-c^
2*d^2*a^2*ln(c*x)+c^2*d^2*b^2*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)+4*c^2*d^2*b
^2*dilog(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*c^2*d^2*b^2*polylog(3,-(1+I*c*x)/
(c^2*x^2+1)^(1/2))-c*d^2*a*b/x-d^2*a*b*arctan(c*x)/x^2-c^2*d^2*b^2*arctan(c
*x)^2*ln(c*x)-c^2*d^2*b^2*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-c
```

```
^2*d^2*b^2*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+c^2*d^2*b^2*arct
an(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)-c^2*d^2*a*b*arctan(c*x)-c*d^2*b^2*a
rctan(c*x)/x-1/2*I*c^2*d^2*b^2*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^
2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1
)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))+1/2*I*c^2*d^2*b^2*Pi*csgn(I*((1+I*c*x)^2/
(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))^2*arctan(c*x)^2+1/2*I*c^2*d^2*b^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1
))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan
(c*x)^2-1/2*I*c^2*d^2*b^2*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-
1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))+1/2*I*c^2*d^2*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/
((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/
(c^2*x^2+1)+1))^2*arctan(c*x)^2-I*c^2*d^2*a*b*ln(c*x)*ln(1+I*c*x)+1/2*I*c^2
*d^2*b^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2
*arctan(c*x)^2-1/2*I*c^2*d^2*b^2*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*
x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3-1/2*I*c^2*d^2*b^2*Pi*csgn(((1+I*c*
x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-4*I*c*d^2*
a*b*arctan(c*x)/x
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2\,(d + c\,d\,x\,1\mathrm{i})^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x^3,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))**2/x**3,x)
```

```
[Out] Timed out
```

3.83 $\int \frac{(d+icdx)^2\left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx$

Optimal. Leaf size=267

$$-\frac{8}{3}abc^3d^2\log(x)-\frac{8}{3}bc^3d^2\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{2ibc^2d^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{d^2(1+icx)^3\left(a+b\tan^{-1}\right.}{3x^3}$$

```
[Out] -1/3*b^2*c^2*d^2/x-1/3*b^2*c^3*d^2*arctan(c*x)-1/3*b*c*d^2*(a+b*arctan(c*x)
)/x^2-2*I*b*c^2*d^2*(a+b*arctan(c*x))/x-1/3*d^2*(1+I*c*x)^3*(a+b*arctan(c*x
))^2/x^3-8/3*a*b*c^3*d^2*ln(x)+2*I*b^2*c^3*d^2*ln(x)-8/3*b*c^3*d^2*(a+b*arc
tan(c*x))*ln(2/(1-I*c*x))-I*b^2*c^3*d^2*ln(c^2*x^2+1)-4/3*I*b^2*c^3*d^2*pol
ylog(2,-I*c*x)+4/3*I*b^2*c^3*d^2*polylog(2,I*c*x)+4/3*I*b^2*c^3*d^2*polylog
(2,1-2/(1-I*c*x))
```

Rubi [A] time = 0.27, antiderivative size = 267, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.560, Rules used = {37, 4874, 4852, 325, 203, 266, 36, 29, 31, 4848, 2391, 4854, 2402, 2315}

$$-\frac{4}{3}ib^2c^3d^2\text{PolyLog}(2,-icx)+\frac{4}{3}ib^2c^3d^2\text{PolyLog}(2,icx)+\frac{4}{3}ib^2c^3d^2\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)-\frac{8}{3}abc^3d^2\log(x)-\frac{2}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x^4,x]
```

```
[Out] -(b^2*c^2*d^2)/(3*x) - (b^2*c^3*d^2*ArcTan[c*x])/3 - (b*c*d^2*(a + b*ArcTan
[c*x]))/(3*x^2) - ((2*I)*b*c^2*d^2*(a + b*ArcTan[c*x]))/x - (d^2*(1 + I*c*x
)^3*(a + b*ArcTan[c*x])^2)/(3*x^3) - (8*a*b*c^3*d^2*Log[x])/3 + (2*I)*b^2*c
^3*d^2*Log[x] - (8*b*c^3*d^2*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/3 - I*
b^2*c^3*d^2*Log[1 + c^2*x^2] - ((4*I)/3)*b^2*c^3*d^2*PolyLog[2, (-I)*c*x] +
 ((4*I)/3)*b^2*c^3*d^2*PolyLog[2, I*c*x] + ((4*I)/3)*b^2*c^3*d^2*PolyLog[2,
 1 - 2/(1 - I*c*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4874

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_.) + (e_
.)*(x_))^(q_), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dis
```

```
t[(a + b*ArcTan[c*x])^p, u, x] - Dist[b*c*p, Int[ExpandIntegrand[(a + b*Arc
Tan[c*x])^(p - 1), u/(1 + c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f,
 q}, x] && IGtQ[p, 1] && EqQ[c^2*d^2 + e^2, 0] && IntegersQ[m, q] && NeQ[m,
 -1] && NeQ[q, -1] && ILtQ[m + q + 1, 0] && LtQ[m*q, 0]
```

Rubi steps

$$\int \frac{(d+icdx)^2 \left(a+b\tan^{-1}(cx)\right)^2}{x^4} dx = -\frac{d^2(1+icx)^3 \left(a+b\tan^{-1}(cx)\right)^2}{3x^3} - (2bc)\int \left(-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{ic\right.$$

$$= -\frac{d^2(1+icx)^3 \left(a+b\tan^{-1}(cx)\right)^2}{3x^3} + \frac{1}{3}\left(2bcd^2\right)\int \frac{a+b\tan^{-1}(cx)}{x^3} dx + (2$$

$$= -\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{2ibc^2d^2\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{d^2(1+icx)^3\left(a+\right.}{3x^3}$$

$$= -\frac{b^2c^2d^2}{3x} - \frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{2ibc^2d^2\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{d^2(1+}{}$$

$$= -\frac{b^2c^2d^2}{3x} - \frac{1}{3}b^2c^3d^2\tan^{-1}(cx) - \frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{2ibc^2d^2\left(a+b\right.}{x}$$

$$= -\frac{b^2c^2d^2}{3x} - \frac{1}{3}b^2c^3d^2\tan^{-1}(cx) - \frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{2ibc^2d^2\left(a+b\right.}{x}$$

Mathematica [A] time = 0.70, size = 253, normalized size = 0.95

$$\frac{d^2\left(3a^2c^2x^2 - 3ia^2cx - a^2 - 8abc^3x^3\log(cx) - 6iabc^2x^2 + 4abc^3x^3\log\left(c^2x^2+1\right) - b\tan^{-1}(cx)\left(a\left(6ic^3x^3 - 6c^2\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^2*(a + b*ArcTan[c*x])^2)/x^4,x]
```

```
[Out] (d^2*(-a^2 - (3*I)*a^2*c*x - a*b*c*x + 3*a^2*c^2*x^2 - (6*I)*a*b*c^2*x^2 -
b^2*c^2*x^2 + b^2*(-1 - I*c*x)^3*ArcTan[c*x]^2 - b*ArcTan[c*x]*(b*c*x*(1 +
(6*I)*c*x + c^2*x^2) + a*(2 + (6*I)*c*x - 6*c^2*x^2 + (6*I)*c^3*x^3) + 8*b*
c^3*x^3*Log[1 - E^((2*I)*ArcTan[c*x])]) - 8*a*b*c^3*x^3*Log[c*x] + (6*I)*b^
2*c^3*x^3*Log[(c*x)/Sqrt[1 + c^2*x^2]] + 4*a*b*c^3*x^3*Log[1 + c^2*x^2] + (
4*I)*b^2*c^3*x^3*PolyLog[2, E^((2*I)*ArcTan[c*x])]))/(3*x^3)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\frac{12\,x^3\text{integral}\left(-\frac{3\,a^2c^4d^2x^4 - 6i\,a^2c^3d^2x^3 - 6i\,a^2cd^2x - 3\,a^2d^2 - \left(-3i\,abc^4d^2x^4 - \left(6\,ab + 3i\,b^2\right)c^3d^2x^3 - 3\,b^2c^2d^2x^2 - \left(6\,ab - i\,b^2\right)cd^2x + 3i\,abd^2\right)\log\left(-\frac{cx}{cx}\right.}{3\left(c^2x^6 + x^4\right)}\right.}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(12*x^3*integral(-1/3*(3*a^2*c^4*d^2*x^4 - 6*I*a^2*c^3*d^2*x^3 - 6*I*a
^2*c*d^2*x - 3*a^2*d^2 - (-3*I*a*b*c^4*d^2*x^4 - (6*a*b + 3*I*b^2)*c^3*d^2*
x^3 - 3*b^2*c^2*d^2*x^2 - (6*a*b - I*b^2)*c*d^2*x + 3*I*a*b*d^2)*log(-(c*x
+ I)/(c*x - I)))/(c^2*x^6 + x^4), x) - (3*b^2*c^2*d^2*x^2 - 3*I*b^2*c*d^2*x
 - b^2*d^2)*log(-(c*x + I)/(c*x - I))^2)/x^3
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.12, size = 669, normalized size = 2.51

$$\frac{2c^2d^2ab\arctan(cx)}{x}-\frac{d^2a^2}{3x^3}-\frac{2icd^2ab\arctan(cx)}{x^2}-\frac{b^2c^2d^2}{3x}-\frac{b^2c^3d^2\arctan(cx)}{3}-ib^2c^3d^2\ln\left(c^2x^2+1\right)+\frac{2ic^3d^2b^2\,\mathrm{dilo}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^4,x)
```

```
[Out] 2/3*I*c^3*d^2*b^2*ln(c*x-I)*ln(c^2*x^2+1)+2/3*I*c^3*d^2*b^2*ln(I+c*x)*ln(1/
2*I*(c*x-I))-2/3*I*c^3*d^2*b^2*ln(I+c*x)*ln(c^2*x^2+1)+2*c^2*d^2*a*b*arctan
(c*x)/x-2*I*c^2*d^2*a*b/x+4/3*I*c^3*d^2*b^2*ln(c*x)*ln(1-I*c*x)-4/3*I*c^3*d
^2*b^2*ln(c*x)*ln(1+I*c*x)-1/3*d^2*a^2/x^3-2*I*c*d^2*a*b*arctan(c*x)/x^2-1/
3*b^2*c^2*d^2/x-1/3*b^2*c^3*d^2*arctan(c*x)-I*b^2*c^3*d^2*ln(c^2*x^2+1)+4/3
*c^3*d^2*a*b*ln(c^2*x^2+1)-1/3*c*d^2*b^2*arctan(c*x)/x^2+c^2*d^2*b^2*arctan
(c*x)^2/x+4/3*c^3*d^2*b^2*arctan(c*x)*ln(c^2*x^2+1)-8/3*c^3*d^2*a*b*ln(c*x)
-8/3*c^3*d^2*b^2*ln(c*x)*arctan(c*x)-1/3*I*c^3*d^2*b^2*ln(c*x-I)^2-1/3*c*d^
2*a*b/x^2-I*c^3*d^2*b^2*arctan(c*x)^2+2/3*I*c^3*d^2*b^2*dilog(1/2*I*(c*x-I)
)+1/3*I*c^3*d^2*b^2*ln(I+c*x)^2-I*c*d^2*a^2/x^2+2*I*c^3*d^2*b^2*ln(c*x)+4/3
*I*c^3*d^2*b^2*dilog(1-I*c*x)-2/3*I*c^3*d^2*b^2*dilog(-1/2*I*(I+c*x))-2/3*d
^2*a*b*arctan(c*x)/x^3-4/3*I*c^3*d^2*b^2*dilog(1+I*c*x)-2*I*c^3*d^2*a*b*arc
tan(c*x)-I*c*d^2*b^2*arctan(c*x)^2/x^2-2*I*c^2*d^2*b^2*arctan(c*x)/x+c^2*d^
2*a^2/x-1/3*d^2*b^2*arctan(c*x)^2/x^3-2/3*I*c^3*d^2*b^2*ln(c*x-I)*ln(-1/2*I
*(I+c*x))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^2/x^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x^4,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^2)/x^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))**2/x**4,x)
```

```
[Out] Timed out
```

3.84 $\int x^3(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=438

$$-\frac{209d^3\left(a+b\tan^{-1}(cx)\right)^2}{140c^4}+\frac{52ibd^3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{35c^4}-\frac{1}{7}ic^3d^3x^7\left(a+b\tan^{-1}(cx)\right)^2+\frac{3abd^3x}{2c^3}-\frac{1}{2}c^2d^3$$

```
[Out] 3/2*a*b*d^3*x/c^3+1/21*I*b*c^2*d^3*x^6*(a+b*arctan(c*x))+7/20*b^2*d^3*x^2/c
^2-1/7*I*c^3*d^3*x^7*(a+b*arctan(c*x))^2-1/20*b^2*d^3*x^4+3/5*I*c*d^3*x^5*(
a+b*arctan(c*x))^2-13/35*I*b*d^3*x^4*(a+b*arctan(c*x))+3/2*b^2*d^3*x*arctan
(c*x)/c^3+122/105*I*b^2*d^3*arctan(c*x)/c^4-1/2*b*d^3*x^3*(a+b*arctan(c*x))
/c-1/105*I*b^2*c*d^3*x^5+1/5*b*c*d^3*x^5*(a+b*arctan(c*x))+44/315*I*b^2*d^3
*x^3/c-209/140*d^3*(a+b*arctan(c*x))^2/c^4+1/4*d^3*x^4*(a+b*arctan(c*x))^2-
122/105*I*b^2*d^3*x/c^3-1/2*c^2*d^3*x^6*(a+b*arctan(c*x))^2+26/35*I*b*d^3*x
^2*(a+b*arctan(c*x))/c^2+52/35*I*b*d^3*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^
4-11/10*b^2*d^3*ln(c^2*x^2+1)/c^4-26/35*b^2*d^3*polylog(2,1-2/(1+I*c*x))/c^
4
```

Rubi [A] time = 1.37, antiderivative size = 438, normalized size of antiderivative = 1.00, number of steps used = 62, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4876, 4852, 4916, 266, 43, 4846, 260, 4884, 302, 203, 321, 4920, 4854, 2402, 2315}

$$-\frac{26b^2d^3\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{35c^4}-\frac{1}{7}ic^3d^3x^7\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}c^2d^3x^6\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{21}ibc^2d^3x^6\left(a+b\tan\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (3*a*b*d^3*x)/(2*c^3) - (((122*I)/105)*b^2*d^3*x)/c^3 + (7*b^2*d^3*x^2)/(20
*c^2) + (((44*I)/315)*b^2*d^3*x^3)/c - (b^2*d^3*x^4)/20 - (I/105)*b^2*c*d^3
*x^5 + (((122*I)/105)*b^2*d^3*ArcTan[c*x])/c^4 + (3*b^2*d^3*x*ArcTan[c*x])/
(2*c^3) + (((26*I)/35)*b*d^3*x^2*(a + b*ArcTan[c*x]))/c^2 - (b*d^3*x^3*(a +
 b*ArcTan[c*x]))/(2*c) - ((13*I)/35)*b*d^3*x^4*(a + b*ArcTan[c*x]) + (b*c*d
^3*x^5*(a + b*ArcTan[c*x]))/5 + (I/21)*b*c^2*d^3*x^6*(a + b*ArcTan[c*x]) -
(209*d^3*(a + b*ArcTan[c*x])^2)/(140*c^4) + (d^3*x^4*(a + b*ArcTan[c*x])^2)
/4 + ((3*I)/5)*c*d^3*x^5*(a + b*ArcTan[c*x])^2 - (c^2*d^3*x^6*(a + b*ArcTan
[c*x])^2)/2 - (I/7)*c^3*d^3*x^7*(a + b*ArcTan[c*x])^2 + (((52*I)/35)*b*d^3*
(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c^4 - (11*b^2*d^3*Log[1 + c^2*x^2])
/(10*c^4) - (26*b^2*d^3*PolyLog[2, 1 - 2/(1 + I*c*x)])/(35*c^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x^3(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2\,dx = \int\left(d^3x^3\left(a+b\tan^{-1}(cx)\right)^2+3icd^3x^4\left(a+b\tan^{-1}(cx)\right)^2-3c^2d^3x^5\left(a\right.\right.$$

$$= d^3\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx+\left(3icd^3\right)\int x^4\left(a+b\tan^{-1}(cx)\right)^2\,dx-$$

$$= \frac{1}{4}d^3x^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{3}{5}icd^3x^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}c^2d^3x^6\left(a-\right.$$

$$= \frac{1}{4}d^3x^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{3}{5}icd^3x^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}c^2d^3x^6\left(a-\right.$$

$$= -\frac{bd^3x^3\left(a+b\tan^{-1}(cx)\right)}{6c}-\frac{3}{10}ibd^3x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}bcd^3x^5\left(a\right.$$

$$= \frac{abd^3x}{2c^3}+\frac{3ibd^3x^2\left(a+b\tan^{-1}(cx)\right)}{5c^2}-\frac{bd^3x^3\left(a+b\tan^{-1}(cx)\right)}{2c}-\frac{13}{35}ib$$

$$= \frac{3abd^3x}{2c^3}-\frac{199ib^2d^3x}{210c^3}+\frac{73ib^2d^3x^3}{630c}-\frac{1}{105}ib^2cd^3x^5+\frac{b^2d^3x\tan^{-1}(cx)}{2c^3}$$

$$= \frac{3abd^3x}{2c^3}-\frac{122ib^2d^3x}{105c^3}+\frac{11b^2d^3x^2}{60c^2}+\frac{44ib^2d^3x^3}{315c}-\frac{1}{20}b^2d^3x^4-\frac{1}{105}ib^2c$$

$$= \frac{3abd^3x}{2c^3}-\frac{122ib^2d^3x}{105c^3}+\frac{7b^2d^3x^2}{20c^2}+\frac{44ib^2d^3x^3}{315c}-\frac{1}{20}b^2d^3x^4-\frac{1}{105}ib^2cd$$

$$= \frac{3abd^3x}{2c^3}-\frac{122ib^2d^3x}{105c^3}+\frac{7b^2d^3x^2}{20c^2}+\frac{44ib^2d^3x^3}{315c}-\frac{1}{20}b^2d^3x^4-\frac{1}{105}ib^2cd$$

Mathematica [A] time = 1.97, size = 408, normalized size = 0.93

$$d^3\left(-180ia^2c^7x^7-630a^2c^6x^6+756ia^2c^5x^5+315a^2c^4x^4+60iabc^6x^6+252abc^5x^5-468iabc^4x^4-630abc^3x^3+\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (d^3*((1464*I)*a*b + 504*b^2 + 1890*a*b*c*x - (1464*I)*b^2*c*x + (936*I)*a*
b*c^2*x^2 + 441*b^2*c^2*x^2 - 630*a*b*c^3*x^3 + (176*I)*b^2*c^3*x^3 + 315*a
^2*c^4*x^4 - (468*I)*a*b*c^4*x^4 - 63*b^2*c^4*x^4 + (756*I)*a^2*c^5*x^5 + 2
52*a*b*c^5*x^5 - (12*I)*b^2*c^5*x^5 - 630*a^2*c^6*x^6 + (60*I)*a*b*c^6*x^6
- (180*I)*a^2*c^7*x^7 + 9*b^2*(-I + c*x)^4*(-1 + (4*I)*c*x + 10*c^2*x^2 - (
20*I)*c^3*x^3)*ArcTan[c*x]^2 + 6*b*ArcTan[c*x]*(b*(244*I + 315*c*x + (156*I
)*c^2*x^2 - 105*c^3*x^3 - (78*I)*c^4*x^4 + 42*c^5*x^5 + (10*I)*c^6*x^6) + 3
*a*(-105 + 35*c^4*x^4 + (84*I)*c^5*x^5 - 70*c^6*x^6 - (20*I)*c^7*x^7) + (31
2*I)*b*Log[1 + E^((2*I)*ArcTan[c*x])]) - (936*I)*a*b*Log[1 + c^2*x^2] - 138
6*b^2*Log[1 + c^2*x^2] + 936*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/(1260
*c^4)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\frac{1}{560}\left(20i\,b^2c^3d^3x^7+70\,b^2c^2d^3x^6-84i\,b^2cd^3x^5-35\,b^2d^3x^4\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(\frac{-140i\,a^2c^5d^3x^8-420\,a^2c^4}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/560*(20*I*b^2*c^3*d^3*x^7 + 70*b^2*c^2*d^3*x^6 - 84*I*b^2*c*d^3*x^5 - 35*
b^2*d^3*x^4)*log(-(c*x + I)/(c*x - I))^2 + integral(1/140*(-140*I*a^2*c^5*d
^3*x^8 - 420*a^2*c^4*d^3*x^7 + 280*I*a^2*c^3*d^3*x^6 - 280*a^2*c^2*d^3*x^5
+ 420*I*a^2*c*d^3*x^4 + 140*a^2*d^3*x^3 + (140*a*b*c^5*d^3*x^8 - 20*(21*I*a
*b + b^2)*c^4*d^3*x^7 - (280*a*b - 70*I*b^2)*c^3*d^3*x^6 - 28*(10*I*a*b - 3
*b^2)*c^2*d^3*x^5 - (420*a*b + 35*I*b^2)*c*d^3*x^4 + 140*I*a*b*d^3*x^3)*log
(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.10, size = 750, normalized size = 1.71

$$\frac{d^3a^2x^4}{4}-\frac{2ic^3d^3ab\arctan(cx)\,x^7}{7}+\frac{6ic\,d^3ab\arctan(cx)\,x^5}{5}+\frac{3ab\,d^3x}{2c^3}+\frac{3b^2d^3x\arctan(cx)}{2c^3}+\frac{ic^2d^3b^2\arctan(cx)\,x^6}{21}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/4*d^3*a^2*x^4-2/7*I*c^3*d^3*a*b*arctan(c*x)*x^7+6/5*I*c*d^3*a*b*arctan(c*
x)*x^5+3/2*a*b*d^3*x/c^3+3/2*b^2*d^3*x*arctan(c*x)/c^3-122/105*I*b^2*d^3*x/
c^3-1/105*I*b^2*c*d^3*x^5+7/20*b^2*d^3*x^2/c^2-26/35*I/c^4*d^3*b^2*arctan(c
*x)*ln(c^2*x^2+1)-26/35*I/c^4*d^3*a*b*ln(c^2*x^2+1)+3/5*I*c*d^3*b^2*arctan(
c*x)^2*x^5-1/7*I*c^3*d^3*b^2*arctan(c*x)^2*x^7+1/21*I*c^2*d^3*b^2*arctan(c*
x)*x^6+26/35*I/c^2*d^3*b^2*arctan(c*x)*x^2+44/315*I*b^2*d^3*x^3/c+122/105*I
*b^2*d^3*arctan(c*x)/c^4-11/10*b^2*d^3*ln(c^2*x^2+1)/c^4+1/21*I*c^2*d^3*a*b
*x^6+26/35*I/c^2*d^3*a*b*x^2-c^2*d^3*a*b*arctan(c*x)*x^6-1/2/c*d^3*b^2*arct
an(c*x)*x^3-1/2*c^2*d^3*b^2*arctan(c*x)^2*x^6-1/2/c*d^3*a*b*x^3+1/5*c*d^3*a
*b*x^5+1/2*d^3*a*b*arctan(c*x)*x^4-13/35/c^4*d^3*b^2*ln(I+c*x)*ln(c^2*x^2+1
)+13/35/c^4*d^3*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))+13/35/c^4*d^3*b^2*ln(c*x-I)
```

```
*ln(c^2*x^2+1)-13/35/c^4*d^3*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-3/2/c^4*d^3*a
*b*arctan(c*x)+1/5*c*d^3*b^2*arctan(c*x)*x^5-13/35*I*d^3*a*b*x^4+3/5*I*c*d^
3*a^2*x^5-1/7*I*c^3*d^3*a^2*x^7-13/35*I*d^3*b^2*arctan(c*x)*x^4+13/35/c^4*d
^3*b^2*dilog(1/2*I*(c*x-I))-13/35/c^4*d^3*b^2*dilog(-1/2*I*(I+c*x))-3/4/c^4
*d^3*b^2*arctan(c*x)^2+13/70/c^4*d^3*b^2*ln(I+c*x)^2-1/2*c^2*d^3*a^2*x^6+1/
4*d^3*b^2*arctan(c*x)^2*x^4-13/70/c^4*d^3*b^2*ln(c*x-I)^2-1/20*b^2*d^3*x^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/7*I*a^2*c^3*d^3*x^7 - 1/2*a^2*c^2*d^3*x^6 + 3/5*I*a^2*c*d^3*x^5 + 1/4*b^
2*d^3*x^4*arctan(c*x)^2 - 1/42*I*(12*x^7*arctan(c*x) - c*((2*c^4*x^6 - 3*c^
2*x^4 + 6*x^2)/c^6 - 6*log(c^2*x^2 + 1)/c^8))*a*b*c^3*d^3 + 1/4*a^2*d^3*x^4
 - 1/15*(15*x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*ar
ctan(c*x)/c^7))*a*b*c^2*d^3 + 3/10*I*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x
^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*a*b*c*d^3 + 1/6*(3*x^4*arctan(c*x) - c*(
(c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*b*d^3 - 1/12*(2*c*((c^2*x^3 - 3
*x)/c^4 + 3*arctan(c*x)/c^5)*arctan(c*x) - (c^2*x^2 + 3*arctan(c*x)^2 - 4*l
og(c^2*x^2 + 1))/c^4)*b^2*d^3 - 1/1120*(40*I*b^2*c^3*d^3*x^7 + 140*b^2*c^2*
d^3*x^6 - 168*I*b^2*c*d^3*x^5)*arctan(c*x)^2 + 1/1120*(40*b^2*c^3*d^3*x^7 -
 140*I*b^2*c^2*d^3*x^6 - 168*b^2*c*d^3*x^5)*arctan(c*x)*log(c^2*x^2 + 1) -
1/1120*(-10*I*b^2*c^3*d^3*x^7 - 35*b^2*c^2*d^3*x^6 + 42*I*b^2*c*d^3*x^5)*lo
g(c^2*x^2 + 1)^2 - I*integrate(1/560*(420*(b^2*c^5*d^3*x^8 - 2*b^2*c^3*d^3*
x^6 - 3*b^2*c*d^3*x^4)*arctan(c*x)^2 + 35*(b^2*c^5*d^3*x^8 - 2*b^2*c^3*d^3*
x^6 - 3*b^2*c*d^3*x^4)*log(c^2*x^2 + 1)^2 - 12*(15*b^2*c^4*d^3*x^7 - 14*b^2
*c^2*d^3*x^5)*arctan(c*x) + 2*(10*b^2*c^5*d^3*x^8 - 77*b^2*c^3*d^3*x^6 - 21
0*(b^2*c^4*d^3*x^7 + b^2*c^2*d^3*x^5)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x
^2 + 1), x) - integrate(1/560*(1260*(b^2*c^4*d^3*x^7 + b^2*c^2*d^3*x^5)*arc
tan(c*x)^2 + 105*(b^2*c^4*d^3*x^7 + b^2*c^2*d^3*x^5)*log(c^2*x^2 + 1)^2 + 4
*(10*b^2*c^5*d^3*x^8 - 77*b^2*c^3*d^3*x^6)*arctan(c*x) + 2*(45*b^2*c^4*d^3*
x^7 - 42*b^2*c^2*d^3*x^5 + 70*(b^2*c^5*d^3*x^8 - 2*b^2*c^3*d^3*x^6 - 3*b^2*
c*d^3*x^4)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))^2*(d + c*d*x*1i)^3,x)
```

```
[Out] int(x^3*(a + b*atan(c*x))^2*(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(d+I*c*d*x)**3*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.85 $\int x^2(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=402

$$-\frac{1}{6}ic^3d^3x^6\left(a+b\tan^{-1}(cx)\right)^2-\frac{37id^3\left(a+b\tan^{-1}(cx)\right)^2}{20c^3}-\frac{28bd^3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{15c^3}-\frac{3}{5}c^2d^3x^5\left(a+b\tan^{-1}\right.$$

```
[Out] 1/15*I*b*c^2*d^3*x^5*(a+b*arctan(c*x))+37/30*b^2*d^3*x/c^2-113/90*I*b^2*d^3
*ln(c^2*x^2+1)/c^3-1/10*b^2*d^3*x^3+3/4*I*c*d^3*x^4*(a+b*arctan(c*x))^2-37/
30*b^2*d^3*arctan(c*x)/c^3-1/60*I*b^2*c*d^3*x^4-14/15*b*d^3*x^2*(a+b*arctan
(c*x))/c-14/15*I*b^2*d^3*polylog(2,1-2/(1+I*c*x))/c^3+3/10*b*c*d^3*x^4*(a+b
*arctan(c*x))-1/6*I*c^3*d^3*x^6*(a+b*arctan(c*x))^2-11/18*I*b*d^3*x^3*(a+b*
arctan(c*x))+1/3*d^3*x^3*(a+b*arctan(c*x))^2-37/20*I*d^3*(a+b*arctan(c*x))^
2/c^3-3/5*c^2*d^3*x^5*(a+b*arctan(c*x))^2+61/180*I*b^2*d^3*x^2/c-28/15*b*d^
3*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3+11/6*I*b^2*d^3*x*arctan(c*x)/c^2+11
/6*I*a*b*d^3*x/c^2
```

Rubi [A] time = 1.20, antiderivative size = 402, normalized size of antiderivative = 1.00, number of steps used = 52, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4876, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 266, 43, 4846, 260, 4884, 302}

$$-\frac{14ib^2d^3\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{15c^3}-\frac{1}{6}ic^3d^3x^6\left(a+b\tan^{-1}(cx)\right)^2-\frac{3}{5}c^2d^3x^5\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{15}ibc^2d^3x^5\left(a+b\tan\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (((11*I)/6)*a*b*d^3*x)/c^2 + (37*b^2*d^3*x)/(30*c^2) + (((61*I)/180)*b^2*d^
3*x^2)/c - (b^2*d^3*x^3)/10 - (I/60)*b^2*c*d^3*x^4 - (37*b^2*d^3*ArcTan[c*x
])/(30*c^3) + (((11*I)/6)*b^2*d^3*x*ArcTan[c*x])/c^2 - (14*b*d^3*x^2*(a + b
*ArcTan[c*x]))/(15*c) - ((11*I)/18)*b*d^3*x^3*(a + b*ArcTan[c*x]) + (3*b*c*
d^3*x^4*(a + b*ArcTan[c*x]))/10 + (I/15)*b*c^2*d^3*x^5*(a + b*ArcTan[c*x])
- (((37*I)/20)*d^3*(a + b*ArcTan[c*x])^2)/c^3 + (d^3*x^3*(a + b*ArcTan[c*x]
)^2)/3 + ((3*I)/4)*c*d^3*x^4*(a + b*ArcTan[c*x])^2 - (3*c^2*d^3*x^5*(a + b*
ArcTan[c*x])^2)/5 - (I/6)*c^3*d^3*x^6*(a + b*ArcTan[c*x])^2 - (28*b*d^3*(a
+ b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(15*c^3) - (((113*I)/90)*b^2*d^3*Log[1
 + c^2*x^2])/c^3 - (((14*I)/15)*b^2*d^3*PolyLog[2, 1 - 2/(1 + I*c*x)])/c^3
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int x^2(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(d^3x^2\left(a+b\tan^{-1}(cx)\right)^2+3icd^3x^3\left(a+b\tan^{-1}(cx)\right)^2-3c^2d^3x^4\left(a+\right.\right.$$

$$=d^3\int x^2\left(a+b\tan^{-1}(cx)\right)^2\,dx+\left(3icd^3\right)\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx-\left(3\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{3}{4}icd^3x^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{3}{5}c^2d^3x^5\left(a+b\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{3}{4}icd^3x^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{3}{5}c^2d^3x^5\left(a+b\right.$$

$$=-\frac{bd^3x^2\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{1}{2}ibd^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{10}bcd^3x^4\left(a+b\right.$$

$$=\frac{3iabd^3x}{2c^2}+\frac{b^2d^3x}{3c^2}-\frac{14bd^3x^2\left(a+b\tan^{-1}(cx)\right)}{15c}-\frac{11}{18}ibd^3x^3\left(a+b\tan^{-1}(c\right.$$

$$=\frac{11iabd^3x}{6c^2}+\frac{37b^2d^3x}{30c^2}-\frac{1}{10}b^2d^3x^3-\frac{b^2d^3\tan^{-1}(cx)}{3c^3}+\frac{3ib^2d^3x\tan^{-1}(cx)}{2c^2}$$

$$=\frac{11iabd^3x}{6c^2}+\frac{37b^2d^3x}{30c^2}+\frac{17ib^2d^3x^2}{60c}-\frac{1}{10}b^2d^3x^3-\frac{1}{60}ib^2cd^3x^4-\frac{37b^2d^3\tan}{30c}$$

$$=\frac{11iabd^3x}{6c^2}+\frac{37b^2d^3x}{30c^2}+\frac{61ib^2d^3x^2}{180c}-\frac{1}{10}b^2d^3x^3-\frac{1}{60}ib^2cd^3x^4-\frac{37b^2d^3\tan}{30c}$$

Mathematica [A] time = 1.51, size = 369, normalized size = 0.92

$$d^3\left(-30ia^2c^6x^6-108a^2c^5x^5+135ia^2c^4x^4+60a^2c^3x^3+12iabc^5x^5+54abc^4x^4-110iabc^3x^3-168abc^2x^2+168ab\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (d^3*(-162*a*b + (64*I)*b^2 + (330*I)*a*b*c*x + 222*b^2*c*x - 168*a*b*c^2*x
^2 + (61*I)*b^2*c^2*x^2 + 60*a^2*c^3*x^3 - (110*I)*a*b*c^3*x^3 - 18*b^2*c^3
```

```
*x^3 + (135*I)*a^2*c^4*x^4 + 54*a*b*c^4*x^4 - (3*I)*b^2*c^4*x^4 - 108*a^2*c
^5*x^5 + (12*I)*a*b*c^5*x^5 - (30*I)*a^2*c^6*x^6 + 3*b^2*(-I + c*x)^4*(I +
4*c*x - (10*I)*c^2*x^2)*ArcTan[c*x]^2 + 2*b*ArcTan[c*x]*(b*(-111 + (165*I)*
c*x - 84*c^2*x^2 - (55*I)*c^3*x^3 + 27*c^4*x^4 + (6*I)*c^5*x^5) + 3*a*(-55*
I + 20*c^3*x^3 + (45*I)*c^4*x^4 - 36*c^5*x^5 - (10*I)*c^6*x^6) - 168*b*Log[
1 + E^((2*I)*ArcTan[c*x])]) + 168*a*b*Log[1 + c^2*x^2] - (226*I)*b^2*Log[1
+ c^2*x^2] + (168*I)*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/(180*c^3)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\frac{1}{240}\left(10i\,b^2c^3d^3x^6+36\,b^2c^2d^3x^5-45i\,b^2cd^3x^4-20\,b^2d^3x^3\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(\frac{-60i\,a^2c^5d^3x^7-180\,a^2c\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/240*(10*I*b^2*c^3*d^3*x^6 + 36*b^2*c^2*d^3*x^5 - 45*I*b^2*c*d^3*x^4 - 20*
b^2*d^3*x^3)*log(-(c*x + I)/(c*x - I))^2 + integral(1/60*(-60*I*a^2*c^5*d^3
*x^7 - 180*a^2*c^4*d^3*x^6 + 120*I*a^2*c^3*d^3*x^5 - 120*a^2*c^2*d^3*x^4 +
180*I*a^2*c*d^3*x^3 + 60*a^2*d^3*x^2 + (60*a*b*c^5*d^3*x^7 - 10*(18*I*a*b +
 b^2)*c^4*d^3*x^6 - (120*a*b - 36*I*b^2)*c^3*d^3*x^5 - 15*(8*I*a*b - 3*b^2)
*c^2*d^3*x^4 - (180*a*b + 20*I*b^2)*c*d^3*x^3 + 60*I*a*b*d^3*x^2)*log(-(c*x
 + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.12, size = 712, normalized size = 1.77

$$-\frac{6c^2d^3ab\arctan(cx)\,x^5}{5}+\frac{d^3a^2x^3}{3}+\frac{ic^2d^3ab\,x^5}{15}+\frac{3ic\,d^3b^2\arctan(cx)^2\,x^4}{4}-\frac{ic^3d^3b^2\arctan(cx)^2\,x^6}{6}-\frac{11id^3ab\arcta}{6c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x)
```

```
[Out] -7/15*I/c^3*d^3*b^2*ln(I+c*x)*ln(c^2*x^2+1)+7/15*I/c^3*d^3*b^2*ln(I+c*x)*ln
(1/2*I*(c*x-I))+7/15*I/c^3*d^3*b^2*ln(c*x-I)*ln(c^2*x^2+1)-7/15*I/c^3*d^3*b
^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/15*I*c^2*d^3*a*b*x^5+3/4*I*c*d^3*b^2*arct
an(c*x)^2*x^4-1/6*I*c^3*d^3*b^2*arctan(c*x)^2*x^6-6/5*c^2*d^3*a*b*arctan(c*
x)*x^5+1/3*d^3*a^2*x^3-11/6*I/c^3*d^3*a*b*arctan(c*x)+1/15*I*c^2*d^3*b^2*ar
ctan(c*x)*x^5-1/60*I*b^2*c*d^3*x^4-113/90*I*b^2*d^3*ln(c^2*x^2+1)/c^3+37/30
*b^2*d^3*x/c^2+11/6*I*a*b*d^3*x/c^2+61/180*I*b^2*d^3*x^2/c+11/6*I*b^2*d^3*x
*arctan(c*x)/c^2-37/30*b^2*d^3*arctan(c*x)/c^3+3/4*I*c*d^3*a^2*x^4+7/15*I/c
^3*d^3*b^2*dilog(1/2*I*(c*x-I))+14/15/c^3*d^3*a*b*ln(c^2*x^2+1)-14/15/c*d^3
*b^2*arctan(c*x)*x^2-3/5*c^2*d^3*b^2*arctan(c*x)^2*x^5+3/10*c*d^3*b^2*arcta
n(c*x)*x^4-11/18*I*d^3*b^2*arctan(c*x)*x^3-1/6*I*c^3*d^3*a^2*x^6-7/15*I/c^3
*d^3*b^2*dilog(-1/2*I*(I+c*x))+7/30*I/c^3*d^3*b^2*ln(I+c*x)^2+2/3*d^3*a*b*a
rctan(c*x)*x^3+14/15/c^3*d^3*b^2*arctan(c*x)*ln(c^2*x^2+1)+3/10*c*d^3*a*b*x
^4-14/15/c*d^3*a*b*x^2-11/18*I*d^3*a*b*x^3-11/12*I/c^3*d^3*b^2*arctan(c*x)^
2-1/3*I*c^3*d^3*a*b*arctan(c*x)*x^6+3/2*I*c*d^3*a*b*arctan(c*x)*x^4-3/5*c^2
*d^3*a^2*x^5+1/3*d^3*b^2*arctan(c*x)^2*x^3-1/10*b^2*d^3*x^3-7/30*I/c^3*d^3*
b^2*ln(c*x-I)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}i\,a^2c^3d^3x^6-\frac{3}{5}\,a^2c^2d^3x^5+\frac{3}{4}i\,a^2cd^3x^4-\frac{1}{45}i\left(15\,x^6\arctan\left(cx\right)-c\left(\frac{3\,c^4x^5-5\,c^2x^3+15\,x}{c^6}-\frac{15\,\arctan\left(cx\right)}{c^7}\right)\right)abc^3d$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/6*I*a^2*c^3*d^3*x^6 - 3/5*a^2*c^2*d^3*x^5 + 3/4*I*a^2*c*d^3*x^4 - 1/45*I
*(15*x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*
x)/c^7))*a*b*c^3*d^3 - 3/10*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 +
 2*log(c^2*x^2 + 1)/c^6))*a*b*c^2*d^3 + 1/3*a^2*d^3*x^3 + 1/2*I*(3*x^4*arct
an(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*b*c*d^3 + 1/3*(2*x
^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a*b*d^3 - 1/960*(40*I*
b^2*c^3*d^3*x^6 + 144*b^2*c^2*d^3*x^5 - 180*I*b^2*c*d^3*x^4 - 80*b^2*d^3*x^
3)*arctan(c*x)^2 + 1/960*(40*b^2*c^3*d^3*x^6 - 144*I*b^2*c^2*d^3*x^5 - 180*
b^2*c*d^3*x^4 + 80*I*b^2*d^3*x^3)*arctan(c*x)*log(c^2*x^2 + 1) - 1/960*(-10
*I*b^2*c^3*d^3*x^6 - 36*b^2*c^2*d^3*x^5 + 45*I*b^2*c*d^3*x^4 + 20*b^2*d^3*x
^3)*log(c^2*x^2 + 1)^2 - I*integrate(1/240*(180*(b^2*c^5*d^3*x^7 - 2*b^2*c^
3*d^3*x^5 - 3*b^2*c*d^3*x^3)*arctan(c*x)^2 + 15*(b^2*c^5*d^3*x^7 - 2*b^2*c^
3*d^3*x^5 - 3*b^2*c*d^3*x^3)*log(c^2*x^2 + 1)^2 - 2*(46*b^2*c^4*d^3*x^6 - 6
5*b^2*c^2*d^3*x^4)*arctan(c*x) + (10*b^2*c^5*d^3*x^7 - 81*b^2*c^3*d^3*x^5 +
 20*b^2*c*d^3*x^3 - 60*(3*b^2*c^4*d^3*x^6 + 2*b^2*c^2*d^3*x^4 - b^2*d^3*x^2
)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x) - integrate(1/240*(180*(
3*b^2*c^4*d^3*x^6 + 2*b^2*c^2*d^3*x^4 - b^2*d^3*x^2)*arctan(c*x)^2 + 15*(3*
b^2*c^4*d^3*x^6 + 2*b^2*c^2*d^3*x^4 - b^2*d^3*x^2)*log(c^2*x^2 + 1)^2 + 2*(
10*b^2*c^5*d^3*x^7 - 81*b^2*c^3*d^3*x^5 + 20*b^2*c*d^3*x^3)*arctan(c*x) + (
46*b^2*c^4*d^3*x^6 - 65*b^2*c^2*d^3*x^4 + 60*(b^2*c^5*d^3*x^7 - 2*b^2*c^3*d
^3*x^5 - 3*b^2*c*d^3*x^3)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2\left(d+c\,d\,x\,1\mathrm{i}\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))^2*(d + c*d*x*1i)^3,x)
```

```
[Out] int(x^2*(a + b*atan(c*x))^2*(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(d+I*c*d*x)**3*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.86 $\int x(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=307

$$\frac{1}{10}ibc^2d^3x^4\left(a+b\tan^{-1}(cx)\right)-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)^2}{5c^2}+\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{4c^2}-\frac{12ibd^3\log\left(\frac{2}{1-i}\right.}{}$$

```
[Out] -5/2*a*b*d^3*x/c+13/10*I*b^2*d^3*x/c-1/4*b^2*d^3*x^2-1/30*I*b^2*c*d^3*x^3-1
3/10*I*b^2*d^3*arctan(c*x)/c^2-5/2*b^2*d^3*x*arctan(c*x)/c-6/5*I*b*d^3*x^2*
(a+b*arctan(c*x))+1/2*b*c*d^3*x^3*(a+b*arctan(c*x))+1/10*I*b*c^2*d^3*x^4*(a
+b*arctan(c*x))+1/4*d^3*(1+I*c*x)^4*(a+b*arctan(c*x))^2/c^2-1/5*d^3*(1+I*c*
x)^5*(a+b*arctan(c*x))^2/c^2-12/5*I*b*d^3*(a+b*arctan(c*x))*ln(2/(1-I*c*x))
/c^2+3/2*b^2*d^3*ln(c^2*x^2+1)/c^2-6/5*b^2*d^3*polylog(2,1-2/(1-I*c*x))/c^2
```

Rubi [A] time = 0.61, antiderivative size = 307, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 14, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.609, Rules used = {4876, 4864, 4846, 260, 4852, 321, 203, 266, 43, 1586, 4854, 2402, 2315, 302}

$$-\frac{6b^2d^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{5c^2}+\frac{1}{10}ibc^2d^3x^4\left(a+b\tan^{-1}(cx)\right)-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)^2}{5c^2}+\frac{d^3(1+icx)^4\left(a\right.}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (-5*a*b*d^3*x)/(2*c) + (((13*I)/10)*b^2*d^3*x)/c - (b^2*d^3*x^2)/4 - (I/30)
*b^2*c*d^3*x^3 - (((13*I)/10)*b^2*d^3*ArcTan[c*x])/c^2 - (5*b^2*d^3*x*ArcTa
n[c*x])/(2*c) - ((6*I)/5)*b*d^3*x^2*(a + b*ArcTan[c*x]) + (b*c*d^3*x^3*(a +
 b*ArcTan[c*x]))/2 + (I/10)*b*c^2*d^3*x^4*(a + b*ArcTan[c*x]) + (d^3*(1 + I
*c*x)^4*(a + b*ArcTan[c*x])^2)/(4*c^2) - (d^3*(1 + I*c*x)^5*(a + b*ArcTan[c
*x])^2)/(5*c^2) - (((12*I)/5)*b*d^3*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])
/c^2 + (3*b^2*d^3*Log[1 + c^2*x^2])/(2*c^2) - (6*b^2*d^3*PolyLog[2, 1 - 2/(
1 - I*c*x)])/(5*c^2)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] :> Int[u*PolynomialQuotient[Px
, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] &&
 EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int x(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(\frac{i(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{c}-\frac{i(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)^2}{cd}\right.$$

$$=\frac{i\int(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2\,dx}{c}-\frac{i\int(d+icdx)^4\left(a+b\tan^{-1}(cx)\right)}{cd}$$

$$=\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{4c^2}-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)^2}{5c^2}+\frac{(2b}{}$$

$$=\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{4c^2}-\frac{d^3(1+icx)^5\left(a+b\tan^{-1}(cx)\right)^2}{5c^2}-\frac{(32}{}$$

$$=-\frac{5abd^3x}{2c}-\frac{6}{5}ibd^3x^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{2}bcd^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{1}$$

$$=-\frac{5abd^3x}{2c}+\frac{6ib^2d^3x}{5c}-\frac{5b^2d^3x\tan^{-1}(cx)}{2c}-\frac{6}{5}ibd^3x^2\left(a+b\tan^{-1}(cx)\right)+$$

$$=-\frac{5abd^3x}{2c}+\frac{13ib^2d^3x}{10c}-\frac{1}{30}ib^2cd^3x^3-\frac{6ib^2d^3\tan^{-1}(cx)}{5c^2}-\frac{5b^2d^3x\tan^{-1}}{2c}$$

$$=-\frac{5abd^3x}{2c}+\frac{13ib^2d^3x}{10c}-\frac{1}{4}b^2d^3x^2-\frac{1}{30}ib^2cd^3x^3-\frac{13ib^2d^3\tan^{-1}(cx)}{10c^2}-\frac{5}{}$$

Mathematica [A] time = 1.40, size = 325, normalized size = 1.06

$$\frac{d^3\left(-12ia^2c^5x^5-45a^2c^4x^4+60ia^2c^3x^3+30a^2c^2x^2+6iabc^4x^4+30abc^3x^3-72iabc^2x^2+72iab\log\left(c^2x^2+1\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (d^3*((-18*I)*a*b - 15*b^2 - 150*a*b*c*x + (78*I)*b^2*c*x + 30*a^2*c^2*x^2
- (72*I)*a*b*c^2*x^2 - 15*b^2*c^2*x^2 + (60*I)*a^2*c^3*x^3 + 30*a*b*c^3*x^3
 - (2*I)*b^2*c^3*x^3 - 45*a^2*c^4*x^4 + (6*I)*a*b*c^4*x^4 - (12*I)*a^2*c^5*
x^5 + 3*b^2*(1 - (4*I)*c*x)*(-I + c*x)^4*ArcTan[c*x]^2 + 6*b*ArcTan[c*x]*(b
*(-13*I - 25*c*x - (12*I)*c^2*x^2 + 5*c^3*x^3 + I*c^4*x^4) + a*(25 + 10*c^2
*x^2 + (20*I)*c^3*x^3 - 15*c^4*x^4 - (4*I)*c^5*x^5) - (24*I)*b*Log[1 + E^((
2*I)*ArcTan[c*x])]) + (72*I)*a*b*Log[1 + c^2*x^2] + 90*b^2*Log[1 + c^2*x^2]
 - 72*b^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/(60*c^2)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\frac{1}{80}\left(4i\,b^2c^3d^3x^5+15\,b^2c^2d^3x^4-20i\,b^2cd^3x^3-10\,b^2d^3x^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+\text{integral}\left(\frac{-20i\,a^2c^5d^3x^6-60\,a^2c^4d^3}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/80*(4*I*b^2*c^3*d^3*x^5 + 15*b^2*c^2*d^3*x^4 - 20*I*b^2*c*d^3*x^3 - 10*b^
2*d^3*x^2)*log(-(c*x + I)/(c*x - I))^2 + integral(1/20*(-20*I*a^2*c^5*d^3*x
^6 - 60*a^2*c^4*d^3*x^5 + 40*I*a^2*c^3*d^3*x^4 - 40*a^2*c^2*d^3*x^3 + 60*I*
a^2*c*d^3*x^2 + 20*a^2*d^3*x + (20*a*b*c^5*d^3*x^6 - 4*(15*I*a*b + b^2)*c^4
*d^3*x^5 - (40*a*b - 15*I*b^2)*c^3*d^3*x^4 - 20*(2*I*a*b - b^2)*c^2*d^3*x^3
 - (60*a*b + 10*I*b^2)*c*d^3*x^2 + 20*I*a*b*d^3*x)*log(-(c*x + I)/(c*x - I)
))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.12, size = 656, normalized size = 2.14

$$2ic\,d^3ab\arctan(cx)\,x^3-\frac{2ic^3d^3ab\arctan(cx)\,x^5}{5}-\frac{3c^2d^3ab\arctan(cx)\,x^4}{2}-\frac{5ab\,d^3x}{2c}-\frac{5b^2d^3x\arctan(cx)}{2c}+\frac{3b^2d^3\ln(}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x)
```

```
[Out] -2/5*I*c^3*d^3*a*b*arctan(c*x)*x^5-3/2*c^2*d^3*a*b*arctan(c*x)*x^4+1/10*I*c
^2*d^3*b^2*arctan(c*x)*x^4+I*c*d^3*b^2*arctan(c*x)^2*x^3-1/5*I*c^3*d^3*b^2*
arctan(c*x)^2*x^5+1/10*I*c^2*d^3*a*b*x^4+6/5*I/c^2*d^3*b^2*ln(c^2*x^2+1)*ar
ctan(c*x)+6/5*I/c^2*d^3*a*b*ln(c^2*x^2+1)-5/2*a*b*d^3*x/c-5/2*b^2*d^3*x*arc
tan(c*x)/c-1/30*I*b^2*c*d^3*x^3-13/10*I*b^2*d^3*arctan(c*x)/c^2+13/10*I*b^2
*d^3*x/c+3/2*b^2*d^3*ln(c^2*x^2+1)/c^2+1/2*c*d^3*b^2*arctan(c*x)*x^3-3/4*c^
2*d^3*b^2*arctan(c*x)^2*x^4-3/5/c^2*d^3*b^2*ln(c*x-I)*ln(c^2*x^2+1)+3/5/c^2
*d^3*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/2*c*d^3*a*b*x^3+d^3*a*b*arctan(c*x)
*x^2+I*c*d^3*a^2*x^3+3/5/c^2*d^3*b^2*ln(I+c*x)*ln(c^2*x^2+1)-3/5/c^2*d^3*b^
2*ln(I+c*x)*ln(1/2*I*(c*x-I))+5/2/c^2*d^3*a*b*arctan(c*x)-6/5*I*d^3*b^2*arc
tan(c*x)*x^2-1/5*I*c^3*d^3*a^2*x^5+1/2*d^3*b^2*arctan(c*x)^2*x^2-3/5/c^2*d^
3*b^2*dilog(1/2*I*(c*x-I))+3/5/c^2*d^3*b^2*dilog(-1/2*I*(I+c*x))+5/4/c^2*d^
3*b^2*arctan(c*x)^2-3/10/c^2*d^3*b^2*ln(I+c*x)^2+3/10/c^2*d^3*b^2*ln(c*x-I)
^2-3/4*c^2*d^3*a^2*x^4+1/2*d^3*a^2*x^2-1/4*b^2*d^3*x^2-6/5*I*d^3*a*b*x^2+2*
I*c*d^3*a*b*arctan(c*x)*x^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{5}i\,a^2c^3d^3x^5-\frac{3}{4}\,a^2c^2d^3x^4-\frac{1}{10}i\left(4\,x^5\arctan(cx)-c\left(\frac{c^2x^4-2\,x^2}{c^4}+\frac{2\,\log\left(c^2x^2+1\right)}{c^6}\right)\right)abc^3d^3+i\,a^2cd^3x^3+\frac{1}{2}\,b^2d^3x^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/5*I*a^2*c^3*d^3*x^5 - 3/4*a^2*c^2*d^3*x^4 - 1/10*I*(4*x^5*arctan(c*x) -
c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*a*b*c^3*d^3 + I*a^2*c*d
^3*x^3 + 1/2*b^2*d^3*x^2*arctan(c*x)^2 - 1/2*(3*x^4*arctan(c*x) - c*((c^2*x
^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*b*c^2*d^3 + I*(2*x^3*arctan(c*x) - c*
(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a*b*c*d^3 + 1/2*a^2*d^3*x^2 + (x^2*arctan
```

```
(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a*b*d^3 - 1/2*(2*c*(x/c^2 - arctan(c*x
)/c^3)*arctan(c*x) + (arctan(c*x)^2 - log(c^2*x^2 + 1))/c^2)*b^2*d^3 - 1/32
0*(16*I*b^2*c^3*d^3*x^5 + 60*b^2*c^2*d^3*x^4 - 80*I*b^2*c*d^3*x^3)*arctan(c
*x)^2 + 1/320*(16*b^2*c^3*d^3*x^5 - 60*I*b^2*c^2*d^3*x^4 - 80*b^2*c*d^3*x^3
)*arctan(c*x)*log(c^2*x^2 + 1) - 1/320*(-4*I*b^2*c^3*d^3*x^5 - 15*b^2*c^2*d
^3*x^4 + 20*I*b^2*c*d^3*x^3)*log(c^2*x^2 + 1)^2 - I*integrate(1/80*(60*(b^2
*c^5*d^3*x^6 - 2*b^2*c^3*d^3*x^4 - 3*b^2*c*d^3*x^2)*arctan(c*x)^2 + 5*(b^2*
c^5*d^3*x^6 - 2*b^2*c^3*d^3*x^4 - 3*b^2*c*d^3*x^2)*log(c^2*x^2 + 1)^2 - 2*(
19*b^2*c^4*d^3*x^5 - 20*b^2*c^2*d^3*x^3)*arctan(c*x) + (4*b^2*c^5*d^3*x^6 -
 35*b^2*c^3*d^3*x^4 - 60*(b^2*c^4*d^3*x^5 + b^2*c^2*d^3*x^3)*arctan(c*x))*l
og(c^2*x^2 + 1))/(c^2*x^2 + 1), x) - integrate(1/80*(180*(b^2*c^4*d^3*x^5 +
 b^2*c^2*d^3*x^3)*arctan(c*x)^2 + 15*(b^2*c^4*d^3*x^5 + b^2*c^2*d^3*x^3)*lo
g(c^2*x^2 + 1)^2 + 2*(4*b^2*c^5*d^3*x^6 - 35*b^2*c^3*d^3*x^4)*arctan(c*x) +
 (19*b^2*c^4*d^3*x^5 - 20*b^2*c^2*d^3*x^3 + 20*(b^2*c^5*d^3*x^6 - 2*b^2*c^3
*d^3*x^4 - 3*b^2*c*d^3*x^2)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))^2*(d + c*d*x*1i)^3,x)
```

```
[Out] int(x*(a + b*atan(c*x))^2*(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(d+I*c*d*x)**3*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.87 $\int (d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)^2 dx$

Optimal. Leaf size=226

$$\frac{1}{6}ibc^2d^3x^3\left(a+b\tan^{-1}(cx)\right)+bcd^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{id^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{4c}+\frac{4bd^3\log\left(\frac{2}{1-icx}\right)\left(a+b\tan\right.}{c}$$

```
[Out] -7/2*I*a*b*d^3*x-b^2*d^3*x-1/12*I*b^2*c*d^3*x^2+b^2*d^3*arctan(c*x)/c-7/2*I
*b^2*d^3*x*arctan(c*x)+b*c*d^3*x^2*(a+b*arctan(c*x))+1/6*I*b*c^2*d^3*x^3*(a
+b*arctan(c*x))-1/4*I*d^3*(1+I*c*x)^4*(a+b*arctan(c*x))^2/c+4*b*d^3*(a+b*ar
ctan(c*x))*ln(2/(1-I*c*x))/c+11/6*I*b^2*d^3*ln(c^2*x^2+1)/c-2*I*b^2*d^3*pol
ylog(2,1-2/(1-I*c*x))/c
```

Rubi [A] time = 0.21, antiderivative size = 226, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4864, 4846, 260, 4852, 321, 203, 266, 43, 1586, 4854, 2402, 2315}

$$-\frac{2ib^2d^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{c}+\frac{1}{6}ibc^2d^3x^3\left(a+b\tan^{-1}(cx)\right)+bcd^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{id^3(1+icx)^4\left(a+b\tan^{-1}\right.}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] ((-7*I)/2)*a*b*d^3*x - b^2*d^3*x - (I/12)*b^2*c*d^3*x^2 + (b^2*d^3*ArcTan[c
*x])/c - ((7*I)/2)*b^2*d^3*x*ArcTan[c*x] + b*c*d^3*x^2*(a + b*ArcTan[c*x])
+ (I/6)*b*c^2*d^3*x^3*(a + b*ArcTan[c*x]) - ((I/4)*d^3*(1 + I*c*x)^4*(a + b
*ArcTan[c*x])^2)/c + (4*b*d^3*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/c + (
((11*I)/6)*b^2*d^3*Log[1 + c^2*x^2])/c - ((2*I)*b^2*d^3*PolyLog[2, 1 - 2/(1
 - I*c*x)])/c
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
```

```
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] :> Int[u*PolynomialQuotient[Px
, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] &&
 EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rubi steps

$$\int (d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)^2 dx = -\frac{id^3(1+icx)^4 \left(a+b\tan^{-1}(cx)\right)^2}{4c} + \frac{(ib)\int \left(-7d^4 \left(a+b\tan^{-1}(cx)\right) - 4icd^4x\right.}{}$$

$$= -\frac{id^3(1+icx)^4 \left(a+b\tan^{-1}(cx)\right)^2}{4c} + \frac{(4b)\int \frac{\left(id^4-cd^4x\right)\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}dx}{d} - \frac{1}{2}\left(7ib\right.$$

$$= -\frac{7}{2}iabd^3x + bcd^3x^2\left(a+b\tan^{-1}(cx)\right) + \frac{1}{6}ibc^2d^3x^3\left(a+b\tan^{-1}(cx)\right) - \frac{id^3(1}{}$$

$$= -\frac{7}{2}iabd^3x - b^2d^3x - \frac{7}{2}ib^2d^3x\tan^{-1}(cx) + bcd^3x^2\left(a+b\tan^{-1}(cx)\right) + \frac{1}{6}ibc^2$$

$$= -\frac{7}{2}iabd^3x - b^2d^3x + \frac{b^2d^3\tan^{-1}(cx)}{c} - \frac{7}{2}ib^2d^3x\tan^{-1}(cx) + bcd^3x^2\left(a+b\,\mathrm{ta}\right.$$

$$= -\frac{7}{2}iabd^3x - b^2d^3x - \frac{1}{12}ib^2cd^3x^2 + \frac{b^2d^3\tan^{-1}(cx)}{c} - \frac{7}{2}ib^2d^3x\tan^{-1}(cx) + b$$

Mathematica [A] time = 0.95, size = 267, normalized size = 1.18

$$-\frac{id^3\left(3a^2c^4x^4 - 12ia^2c^3x^3 - 18a^2c^2x^2 + 12ia^2cx - 2abc^3x^3 + 12iabc^2x^2 - 24iab\log\left(c^2x^2+1\right) + 2b\tan^{-1}(cx)\left(3a\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] ((-1/12*I)*d^3*(b^2 + (12*I)*a^2*c*x + 42*a*b*c*x - (12*I)*b^2*c*x - 18*a^2
*c^2*x^2 + (12*I)*a*b*c^2*x^2 + b^2*c^2*x^2 - (12*I)*a^2*c^3*x^3 - 2*a*b*c^
3*x^3 + 3*a^2*c^4*x^4 + 3*b^2*(-I + c*x)^4*ArcTan[c*x]^2 + 2*b*ArcTan[c*x]*
(b*(6*I + 21*c*x + (6*I)*c^2*x^2 - c^3*x^3) + 3*a*(-7 + (4*I)*c*x - 6*c^2*x
^2 - (4*I)*c^3*x^3 + c^4*x^4) + (24*I)*b*Log[1 + E^((2*I)*ArcTan[c*x])]) -
(24*I)*a*b*Log[1 + c^2*x^2] - 22*b^2*Log[1 + c^2*x^2] + 24*b^2*PolyLog[2, -
E^((2*I)*ArcTan[c*x])]))/c
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\frac{1}{16}\left(i\,b^2c^3d^3x^4 + 4\,b^2c^2d^3x^3 - 6i\,b^2cd^3x^2 - 4\,b^2d^3x\right)\log\left(-\frac{cx+i}{cx-i}\right)^2 + \mathrm{integral}\left(\frac{-4i\,a^2c^5d^3x^5 - 12\,a^2c^4d^3x^4 + 8i\,a^2c}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/16*(I*b^2*c^3*d^3*x^4 + 4*b^2*c^2*d^3*x^3 - 6*I*b^2*c*d^3*x^2 - 4*b^2*d^3
*x)*log(-(c*x + I)/(c*x - I))^2 + integral(1/4*(-4*I*a^2*c^5*d^3*x^5 - 12*a
^2*c^4*d^3*x^4 + 8*I*a^2*c^3*d^3*x^3 - 8*a^2*c^2*d^3*x^2 + 12*I*a^2*c*d^3*x
 + 4*a^2*d^3 + (4*a*b*c^5*d^3*x^5 + (-12*I*a*b - b^2)*c^4*d^3*x^4 - (8*a*b
- 4*I*b^2)*c^3*d^3*x^3 - 2*(4*I*a*b - 3*b^2)*c^2*d^3*x^2 - (12*a*b + 4*I*b^
2)*c*d^3*x + 4*I*a*b*d^3)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 620, normalized size = 2.74

$$-\frac{i d^3 a^2}{4c}+d^3 b^2 \arctan(cx)^2 x-c^2 d^3 a^2 x^3+\frac{i c^2 d^3 ab\, x^3}{6}+\frac{i c^2 d^3 b^2 \arctan(cx)\, x^3}{6}+\frac{i d^3 b^2 \ln(cx+i)\ln\left(c^2x^2+1\right)}{c}-\frac{i c^3 d}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x)
```

```
[Out] d^3*b^2*arctan(c*x)^2*x-c^2*d^3*a^2*x^3-1/4*I/c*d^3*a^2-I/c*d^3*b^2*ln(c*x-
I)*ln(c^2*x^2+1)-I/c*d^3*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))+7/2*I/c*d^3*a*b*ar
ctan(c*x)+I/c*d^3*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/6*I*c^2*d^3*a*b*x^3+1/
6*I*c^2*d^3*b^2*arctan(c*x)*x^3-2*c^2*d^3*a*b*arctan(c*x)*x^3+I/c*d^3*b^2*l
n(I+c*x)*ln(c^2*x^2+1)-1/4*I*c^3*d^3*b^2*arctan(c*x)^2*x^4+3/2*I*c*d^3*b^2*
arctan(c*x)^2*x^2+11/6*I*b^2*d^3*ln(c^2*x^2+1)/c+b^2*d^3*arctan(c*x)/c-7/2*
I*a*b*d^3*x-1/12*I*b^2*c*d^3*x^2-7/2*I*b^2*d^3*x*arctan(c*x)-2/c*d^3*a*b*ln
(c^2*x^2+1)-2/c*d^3*b^2*arctan(c*x)*ln(c^2*x^2+1)+c*d^3*b^2*arctan(c*x)*x^2
-c^2*d^3*b^2*arctan(c*x)^2*x^3+2*d^3*a*b*arctan(c*x)*x+c*d^3*a*b*x^2+7/4*I/
c*d^3*b^2*arctan(c*x)^2+1/2*I/c*d^3*b^2*ln(c*x-I)^2-1/2*I/c*d^3*b^2*ln(I+c*
x)^2-I/c*d^3*b^2*dilog(1/2*I*(c*x-I))+3/2*I*c*x^2*a^2*d^3+I/c*d^3*b^2*dilog
(-1/2*I*(I+c*x))-1/4*I*c^3*x^4*a^2*d^3-b^2*d^3*x+x*a^2*d^3+3*I*c*d^3*a*b*ar
ctan(c*x)*x^2-1/2*I*c^3*d^3*a*b*arctan(c*x)*x^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] -1/4*I*a^2*c^3*d^3*x^4 - 4*b^2*c^5*d^3*integrate(1/16*x^5*arctan(c*x)*log(c
^2*x^2 + 1)/(c^2*x^2 + 1), x) - 2*b^2*c^5*d^3*integrate(1/16*x^5*arctan(c*x
)/(c^2*x^2 + 1), x) - a^2*c^2*d^3*x^3 - 36*b^2*c^4*d^3*integrate(1/16*x^4*a
rctan(c*x)^2/(c^2*x^2 + 1), x) - 3*b^2*c^4*d^3*integrate(1/16*x^4*log(c^2*x
^2 + 1)^2/(c^2*x^2 + 1), x) - 5*b^2*c^4*d^3*integrate(1/16*x^4*log(c^2*x^2
+ 1)/(c^2*x^2 + 1), x) - 1/6*I*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4
+ 3*arctan(c*x)/c^5))*a*b*c^3*d^3 + 8*b^2*c^3*d^3*integrate(1/16*x^3*arctan
(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + 20*b^2*c^3*d^3*integrate(1/16*x^
3*arctan(c*x)/(c^2*x^2 + 1), x) - (2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2
*x^2 + 1)/c^4))*a*b*c^2*d^3 + 3/2*I*a^2*c*d^3*x^2 - 24*b^2*c^2*d^3*integrat
e(1/16*x^2*arctan(c*x)^2/(c^2*x^2 + 1), x) - 2*b^2*c^2*d^3*integrate(1/16*x
^2*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + 10*b^2*c^2*d^3*integrate(1/16*x^2
*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + 3*I*(x^2*arctan(c*x) - c*(x/c^2 - arc
tan(c*x)/c^3))*a*b*c*d^3 + 1/4*b^2*d^3*arctan(c*x)^3/c + 12*b^2*c*d^3*integ
rate(1/16*x*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) - 8*b^2*c*d^3*in
tegrate(1/16*x*arctan(c*x)/(c^2*x^2 + 1), x) + a^2*d^3*x + b^2*d^3*integrat
e(1/16*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + (2*c*x*arctan(c*x) - log(c^2*
x^2 + 1))*a*b*d^3/c - 1/64*(4*I*b^2*c^3*d^3*x^4 + 16*b^2*c^2*d^3*x^3 - 24*I
*b^2*c*d^3*x^2 - 16*b^2*d^3*x)*arctan(c*x)^2 + 1/64*(4*b^2*c^3*d^3*x^4 - 16
*I*b^2*c^2*d^3*x^3 - 24*b^2*c*d^3*x^2 + 16*I*b^2*d^3*x)*arctan(c*x)*log(c^2
*x^2 + 1) - 1/64*(-I*b^2*c^3*d^3*x^4 - 4*b^2*c^2*d^3*x^3 + 6*I*b^2*c*d^3*x^
2 + 4*b^2*d^3*x)*log(c^2*x^2 + 1)^2 - I*integrate(1/16*(12*(b^2*c^5*d^3*x^5
 - 2*b^2*c^3*d^3*x^3 - 3*b^2*c*d^3*x)*arctan(c*x)^2 + (b^2*c^5*d^3*x^5 - 2*
b^2*c^3*d^3*x^3 - 3*b^2*c*d^3*x)*log(c^2*x^2 + 1)^2 - 10*(b^2*c^4*d^3*x^4 -
 2*b^2*c^2*d^3*x^2)*arctan(c*x) + (b^2*c^5*d^3*x^5 - 10*b^2*c^3*d^3*x^3 + 4
*b^2*c*d^3*x - 4*(3*b^2*c^4*d^3*x^4 + 2*b^2*c^2*d^3*x^2 - b^2*d^3)*arctan(c
*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{atan}\,(c\,x))^2\,(d + c\,d\,x\,1\mathrm{i})^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2*(d + c*d*x*1i)^3,x)
```

```
[Out] int((a + b*atan(c*x))^2*(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.88 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx$

Optimal. Leaf size=385

$$-\frac{1}{3}ic^3d^3x^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{3}{2}c^2d^3x^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{3}ibc^2d^3x^2\left(a+b\tan^{-1}(cx)\right)-ibd^3\mathrm{Li}_2\left(1-\frac{2}{icx+1}\right)$$

```
[Out] 3*a*b*c*d^3*x+3*I*c*d^3*x*(a+b*arctan(c*x))^2+I*b*d^3*(a+b*arctan(c*x))*pol
ylog(2,-1+2/(1+I*c*x))+3*b^2*c*d^3*x*arctan(c*x)-1/3*I*c^3*d^3*x^3*(a+b*arc
tan(c*x))^2-29/6*d^3*(a+b*arctan(c*x))^2-1/3*I*b^2*c*d^3*x-3/2*c^2*d^3*x^2*
(a+b*arctan(c*x))^2+1/3*I*b^2*d^3*arctan(c*x)-2*d^3*(a+b*arctan(c*x))^2*arc
tanh(-1+2/(1+I*c*x))+1/3*I*b*c^2*d^3*x^2*(a+b*arctan(c*x))-3/2*b^2*d^3*ln(c
^2*x^2+1)-10/3*b^2*d^3*polylog(2,1-2/(1+I*c*x))-I*b*d^3*(a+b*arctan(c*x))*p
olylog(2,1-2/(1+I*c*x))+20/3*I*b*d^3*(a+b*arctan(c*x))*ln(2/(1+I*c*x))-1/2*
b^2*d^3*polylog(3,1-2/(1+I*c*x))+1/2*b^2*d^3*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.77, antiderivative size = 385, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4850, 4988, 4884, 4994, 6610, 4852, 4916, 260, 321, 203}

$$-ibd^3\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+ibd^3\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{10}{3}b^2d^3\text{Po}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] 3*a*b*c*d^3*x - (I/3)*b^2*c*d^3*x + (I/3)*b^2*d^3*ArcTan[c*x] + 3*b^2*c*d^3
*x*ArcTan[c*x] + (I/3)*b*c^2*d^3*x^2*(a + b*ArcTan[c*x]) - (29*d^3*(a + b*A
rcTan[c*x])^2)/6 + (3*I)*c*d^3*x*(a + b*ArcTan[c*x])^2 - (3*c^2*d^3*x^2*(a
+ b*ArcTan[c*x])^2)/2 - (I/3)*c^3*d^3*x^3*(a + b*ArcTan[c*x])^2 + 2*d^3*(a
+ b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + ((20*I)/3)*b*d^3*(a + b*Arc
Tan[c*x])*Log[2/(1 + I*c*x)] - (3*b^2*d^3*Log[1 + c^2*x^2])/2 - (10*b^2*d^3
*PolyLog[2, 1 - 2/(1 + I*c*x)])/3 - I*b*d^3*(a + b*ArcTan[c*x])*PolyLog[2,
1 - 2/(1 + I*c*x)] + I*b*d^3*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c
*x)] - (b^2*d^3*PolyLog[3, 1 - 2/(1 + I*c*x)])/2 + (b^2*d^3*PolyLog[3, -1 +
 2/(1 + I*c*x)])/2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx=\int\left(3icd^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{x}-3c^2d^3x\left(a+b\tan\right.\right.$$

$$=d^3\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx+\left(3icd^3\right)\int\left(a+b\tan^{-1}(cx)\right)^2\,dx-\left(3c^2d^3\right.$$

$$=3icd^3x\left(a+b\tan^{-1}(cx)\right)^2-\frac{3}{2}c^2d^3x^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{3}ic^3d^3x^3\left(a+\right.$$

$$=-3d^3\left(a+b\tan^{-1}(cx)\right)^2+3icd^3x\left(a+b\tan^{-1}(cx)\right)^2-\frac{3}{2}c^2d^3x^2\left(a+b\tan\right.$$

$$=3abcd^3x+\frac{1}{3}ibc^2d^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{29}{6}d^3\left(a+b\tan^{-1}(cx)\right)^2+3icd$$

$$=3abcd^3x-\frac{1}{3}ib^2cd^3x+3b^2cd^3x\tan^{-1}(cx)+\frac{1}{3}ibc^2d^3x^2\left(a+b\tan^{-1}(cx)\right)$$

$$=3abcd^3x-\frac{1}{3}ib^2cd^3x+\frac{1}{3}ib^2d^3\tan^{-1}(cx)+3b^2cd^3x\tan^{-1}(cx)+\frac{1}{3}ibc^2d^3$$

$$=3abcd^3x-\frac{1}{3}ib^2cd^3x+\frac{1}{3}ib^2d^3\tan^{-1}(cx)+3b^2cd^3x\tan^{-1}(cx)+\frac{1}{3}ibc^2d^3$$

Mathematica [A] time = 0.97, size = 465, normalized size = 1.21

$$-\frac{1}{24}id^3\left(8a^2c^3x^3-36ia^2c^2x^2-72a^2cx+24ia^2\log(cx)+16abc^3x^3\tan^{-1}(cx)-8abc^2x^2+80ab\log\left(c^2x^2+1\right)\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] (-1/24*I)*d^3*(b^2*Pi^3 - 72*a^2*c*x + (72*I)*a*b*c*x + 8*b^2*c*x - (36*I)*
a^2*c^2*x^2 - 8*a*b*c^2*x^2 + 8*a^2*c^3*x^3 - (72*I)*a*b*ArcTan[c*x] - 8*b^
2*ArcTan[c*x] - 144*a*b*c*x*ArcTan[c*x] + (72*I)*b^2*c*x*ArcTan[c*x] - (72*
I)*a*b*c^2*x^2*ArcTan[c*x] - 8*b^2*c^2*x^2*ArcTan[c*x] + 16*a*b*c^3*x^3*Arc
Tan[c*x] + (44*I)*b^2*ArcTan[c*x]^2 - 72*b^2*c*x*ArcTan[c*x]^2 - (36*I)*b^2
*c^2*x^2*ArcTan[c*x]^2 + 8*b^2*c^3*x^3*ArcTan[c*x]^2 - 16*b^2*ArcTan[c*x]^3
 + (24*I)*b^2*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 160*b^2*ArcTa
n[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - (24*I)*b^2*ArcTan[c*x]^2*Log[1 + E^
((2*I)*ArcTan[c*x])] + (24*I)*a^2*Log[c*x] + 80*a*b*Log[1 + c^2*x^2] - (36*
I)*b^2*Log[1 + c^2*x^2] - 24*b^2*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*
x])] - 8*b^2*(-10*I + 3*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])] - 2
4*a*b*PolyLog[2, (-I)*c*x] + 24*a*b*PolyLog[2, I*c*x] + (12*I)*b^2*PolyLog[
3, E^((-2*I)*ArcTan[c*x])] - (12*I)*b^2*PolyLog[3, -E^((2*I)*ArcTan[c*x])])
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-4i\,a^2c^3d^3x^3 - 12\,a^2c^2d^3x^2 + 12i\,a^2cd^3x + 4\,a^2d^3 + \left(i\,b^2c^3d^3x^3 + 3\,b^2c^2d^3x^2 - 3i\,b^2cd^3x - b^2d^3\right)\log\left(-\right.}{4\,x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral(1/4*(-4*I*a^2*c^3*d^3*x^3 - 12*a^2*c^2*d^3*x^2 + 12*I*a^2*c*d^3*x
+ 4*a^2*d^3 + (I*b^2*c^3*d^3*x^3 + 3*b^2*c^2*d^3*x^2 - 3*I*b^2*c*d^3*x - b^
2*d^3)*log(-(c*x + I)/(c*x - I))^2 + (4*a*b*c^3*d^3*x^3 - 12*I*a*b*c^2*d^3*
x^2 - 12*a*b*c*d^3*x + 4*I*a*b*d^3)*log(-(c*x + I)/(c*x - I)))/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 6.33, size = 1651, normalized size = 4.29

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x,x)
```

```
[Out] 20/3*d^3*b^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*d^3*b^2*polylog(3,-
(1+I*c*x)^2/(c^2*x^2+1))+3*d^3*b^2*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+2*d^3*b^2*
polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+20/3*d^3*b^2*dilog(1-I*(1+I*c*x)/(c
^2*x^2+1)^(1/2))+2*d^3*b^2*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+11/6*d^3*
b^2*arctan(c*x)^2+d^3*a^2*ln(c*x)+d^3*b^2*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2
*x^2+1)^(1/2))+d^3*b^2*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-d^3*
b^2*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+d^3*b^2*arctan(c*x)^2*ln(c*
x)-8/3*I*d^3*b^2*arctan(c*x)-3/2*d^3*a^2*c^2*x^2-3*d^3*a*b*arctan(c*x)-1/2*
I*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x
^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+6*I*d^3*a*b*arctan(c*
x)*c*x-2/3*I*d^3*a*b*arctan(c*x)*c^3*x^3-1/2*I*d^3*b^2*Pi*csgn(I*((1+I*c*x)
```

```
^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1
)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*d^3*b^2*Pi*csgn(I/(
(1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*d^3*b^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^
2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*d^3*b^2*Pi*csgn(
((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+1/
2*I*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+
1))^3*arctan(c*x)^2+I*d^3*a*b*ln(c*x)*ln(1+I*c*x)-I*d^3*a*b*ln(c*x)*ln(1-I*
c*x)+1/3*I*d^3*a*b*c^2*x^2+3*I*d^3*b^2*arctan(c*x)^2*c*x-1/3*I*d^3*b^2*arct
an(c*x)^2*c^3*x^3-3*d^3*a*b*arctan(c*x)*c^2*x^2+1/3*I*d^3*b^2*arctan(c*x)*c
^2*x^2+3*a*b*c*d^3*x+3*b^2*c*d^3*x*arctan(c*x)-1/3*I*b^2*c*d^3*x-3/2*d^3*b^
2*arctan(c*x)^2*c^2*x^2-1/3*I*d^3*a^2*c^3*x^3+2*d^3*a*b*arctan(c*x)*ln(c*x)
+I*d^3*a*b*dilog(1+I*c*x)-I*d^3*a*b*dilog(1-I*c*x)-10/3*I*d^3*a*b*ln(c^2*x^
2+1)+I*d^3*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+1/2*I*d^3*b^
2*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2
+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))+1/2*I
*d^3*b^2*arctan(c*x)^2*Pi+20/3*I*d^3*b^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*
x^2+1)^(1/2))+20/3*I*d^3*b^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2)
)-2*I*d^3*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*d^3*b
^2*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*I*d^3*a^2*c*x+1/2*I
*d^3*b^2*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*
c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2
*x^2+1)+1))+1/3*d^3*b^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] -1/3*I*a^2*c^3*d^3*x^3 - 36*I*b^2*c^5*d^3*integrate(1/48*x^5*arctan(c*x)^2/
(c^2*x^3 + x), x) - 12*b^2*c^5*d^3*integrate(1/48*x^5*arctan(c*x)*log(c^2*x
^2 + 1)/(c^2*x^3 + x), x) - 3*I*b^2*c^5*d^3*integrate(1/48*x^5*log(c^2*x^2
+ 1)^2/(c^2*x^3 + x), x) - 96*I*a*b*c^5*d^3*integrate(1/48*x^5*arctan(c*x)/
(c^2*x^3 + x), x) - 8*b^2*c^5*d^3*integrate(1/48*x^5*arctan(c*x)/(c^2*x^3 +
 x), x) - 4*I*b^2*c^5*d^3*integrate(1/48*x^5*log(c^2*x^2 + 1)/(c^2*x^3 + x)
, x) - 108*b^2*c^4*d^3*integrate(1/48*x^4*arctan(c*x)^2/(c^2*x^3 + x), x) +
 36*I*b^2*c^4*d^3*integrate(1/48*x^4*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3
+ x), x) - 9*b^2*c^4*d^3*integrate(1/48*x^4*log(c^2*x^2 + 1)^2/(c^2*x^3 + x
), x) - 288*a*b*c^4*d^3*integrate(1/48*x^4*arctan(c*x)/(c^2*x^3 + x), x) +
44*I*b^2*c^4*d^3*integrate(1/48*x^4*arctan(c*x)/(c^2*x^3 + x), x) - 22*b^2*
c^4*d^3*integrate(1/48*x^4*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) - 3/2*a^2*c^2
*d^3*x^2 + 72*I*b^2*c^3*d^3*integrate(1/48*x^3*arctan(c*x)^2/(c^2*x^3 + x),
 x) + 24*b^2*c^3*d^3*integrate(1/48*x^3*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x
^3 + x), x) + 6*I*b^2*c^3*d^3*integrate(1/48*x^3*log(c^2*x^2 + 1)^2/(c^2*x^
3 + x), x) - 96*I*a*b*c^3*d^3*integrate(1/48*x^3*arctan(c*x)/(c^2*x^3 + x),
 x) + 108*b^2*c^3*d^3*integrate(1/48*x^3*arctan(c*x)/(c^2*x^3 + x), x) + 54
*I*b^2*c^3*d^3*integrate(1/48*x^3*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + 3/4*
I*b^2*d^3*arctan(c*x)^3 - 72*b^2*c^2*d^3*integrate(1/48*x^2*arctan(c*x)^2/(
c^2*x^3 + x), x) + 24*I*b^2*c^2*d^3*integrate(1/48*x^2*arctan(c*x)*log(c^2*
x^2 + 1)/(c^2*x^3 + x), x) - 192*a*b*c^2*d^3*integrate(1/48*x^2*arctan(c*x)
/(c^2*x^3 + x), x) - 72*I*b^2*c^2*d^3*integrate(1/48*x^2*arctan(c*x)/(c^2*x
^3 + x), x) - 1/48*b^2*d^3*log(c^2*x^2 + 1)^3 + 3*I*a^2*c*d^3*x + 36*b^2*c*
d^3*integrate(1/48*x*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + 9*I*b
^2*c*d^3*integrate(1/48*x*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 3/16*b^2*d
^3*log(c^2*x^2 + 1)^2 + 3*I*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*a*b*d^3
+ 36*b^2*d^3*integrate(1/48*arctan(c*x)^2/(c^2*x^3 + x), x) - 12*I*b^2*d^3*
integrate(1/48*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + 3*b^2*d^3*i
ntegrate(1/48*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 96*a*b*d^3*integrate(1
```

```
/48*arctan(c*x)/(c^2*x^3 + x), x) + a^2*d^3*log(x) - 1/96*(8*I*b^2*c^3*d^3*
x^3 + 36*b^2*c^2*d^3*x^2 - 72*I*b^2*c*d^3*x)*arctan(c*x)^2 + 1/96*(8*b^2*c^
3*d^3*x^3 - 36*I*b^2*c^2*d^3*x^2 - 72*b^2*c*d^3*x)*arctan(c*x)*log(c^2*x^2
+ 1) - 1/96*(-2*I*b^2*c^3*d^3*x^3 - 9*b^2*c^2*d^3*x^2 + 18*I*b^2*c*d^3*x)*l
og(c^2*x^2 + 1)^2
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2\,(d + c\,d\,x\,1\mathrm{i})^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2/x,x)
```

```
[Out] Timed out
```

3.89 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx$

Optimal. Leaf size=402

$$-\frac{1}{2}ic^3d^3x^2\left(a+b\tan^{-1}(cx)\right)^2+iabc^2d^3x-3c^2d^3x\left(a+b\tan^{-1}(cx)\right)^2+3bcd^3\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)-3$$

```
[Out] I*a*b*c^2*d^3*x-9/2*I*c*d^3*(a+b*arctan(c*x))^2-6*I*c*d^3*(a+b*arctan(c*x))
^2*arctanh(-1+2/(1+I*c*x))-d^3*(a+b*arctan(c*x))^2/x-3*c^2*d^3*x*(a+b*arcta
n(c*x))^2-3*I*b^2*c*d^3*polylog(2,1-2/(1+I*c*x))-1/2*I*b^2*c*d^3*ln(c^2*x^2
+1)-6*b*c*d^3*(a+b*arctan(c*x))*ln(2/(1+I*c*x))-I*b^2*c*d^3*polylog(2,-1+2/
(1-I*c*x))+2*b*c*d^3*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))+3/2*I*b^2*c*d^3*po
lylog(3,-1+2/(1+I*c*x))-1/2*I*c^3*d^3*x^2*(a+b*arctan(c*x))^2+3*b*c*d^3*(a+
b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))-3*b*c*d^3*(a+b*arctan(c*x))*polylog
(2,-1+2/(1+I*c*x))-3/2*I*b^2*c*d^3*polylog(3,1-2/(1+I*c*x))+I*b^2*c^2*d^3*x
*arctan(c*x)
```

Rubi [A] time = 0.74, antiderivative size = 402, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 17, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4924, 4868, 2447, 4850, 4988, 4884, 4994, 6610, 4916, 260}

$$3bcd^3\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-3bcd^3\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-ib^2cd^3\text{Po}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] I*a*b*c^2*d^3*x + I*b^2*c^2*d^3*x*ArcTan[c*x] - ((9*I)/2)*c*d^3*(a + b*ArcT
an[c*x])^2 - (d^3*(a + b*ArcTan[c*x])^2)/x - 3*c^2*d^3*x*(a + b*ArcTan[c*x]
)^2 - (I/2)*c^3*d^3*x^2*(a + b*ArcTan[c*x])^2 + (6*I)*c*d^3*(a + b*ArcTan[c
*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] - 6*b*c*d^3*(a + b*ArcTan[c*x])*Log[2/(1
+ I*c*x)] - (I/2)*b^2*c*d^3*Log[1 + c^2*x^2] + 2*b*c*d^3*(a + b*ArcTan[c*x]
)*Log[2 - 2/(1 - I*c*x)] - I*b^2*c*d^3*PolyLog[2, -1 + 2/(1 - I*c*x)] - (3*
I)*b^2*c*d^3*PolyLog[2, 1 - 2/(1 + I*c*x)] + 3*b*c*d^3*(a + b*ArcTan[c*x])*
PolyLog[2, 1 - 2/(1 + I*c*x)] - 3*b*c*d^3*(a + b*ArcTan[c*x])*PolyLog[2, -1
 + 2/(1 + I*c*x)] - ((3*I)/2)*b^2*c*d^3*PolyLog[3, 1 - 2/(1 + I*c*x)] + ((3
*I)/2)*b^2*c*d^3*PolyLog[3, -1 + 2/(1 + I*c*x)]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
```

```
e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx = \int \left(-3c^2d^3 \left(a+b\tan^{-1}(cx)\right)^2 + \frac{d^3 \left(a+b\tan^{-1}(cx)\right)^2}{x^2} + \frac{3icd^3 \left(a+b\tan^{-1}\right.}{x}\right.$$

$$= d^3 \int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx + \left(3icd^3\right) \int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx - \left(3c^2d^3\right) \int$$

$$= -\frac{d^3 \left(a+b\tan^{-1}(cx)\right)^2}{x} - 3c^2d^3x \left(a+b\tan^{-1}(cx)\right)^2 - \frac{1}{2}ic^3d^3x^2 \left(a+b\tan^{-}\right.$$

$$= -4icd^3 \left(a+b\tan^{-1}(cx)\right)^2 - \frac{d^3 \left(a+b\tan^{-1}(cx)\right)^2}{x} - 3c^2d^3x \left(a+b\tan^{-1}(cx\right.$$

$$= iabc^2d^3x - \frac{9}{2}icd^3 \left(a+b\tan^{-1}(cx)\right)^2 - \frac{d^3 \left(a+b\tan^{-1}(cx)\right)^2}{x} - 3c^2d^3x \left(a+\right.$$

$$= iabc^2d^3x + ib^2c^2d^3x\tan^{-1}(cx) - \frac{9}{2}icd^3 \left(a+b\tan^{-1}(cx)\right)^2 - \frac{d^3 \left(a+b\tan^{-1}\right.}{x}$$

$$= iabc^2d^3x + ib^2c^2d^3x\tan^{-1}(cx) - \frac{9}{2}icd^3 \left(a+b\tan^{-1}(cx)\right)^2 - \frac{d^3 \left(a+b\tan^{-1}\right.}{x}$$

Mathematica [A] time = 0.63, size = 512, normalized size = 1.27

$$\frac{d^3 \left(-4ia^2c^3x^3 - 24a^2c^2x^2 + 24ia^2cx\log(x) - 8a^2 - 8iabc^3x^3\tan^{-1}(cx) + 8iabc^2x^2 + 16abcx\log\left(c^2x^2+1\right) - 48ab\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] (d^3*(-8*a^2 + b^2*c*Pi^3*x - 24*a^2*c^2*x^2 + (8*I)*a*b*c^2*x^2 - (4*I)*a^
2*c^3*x^3 - 16*a*b*ArcTan[c*x] - (8*I)*a*b*c*x*ArcTan[c*x] - 48*a*b*c^2*x^2
*ArcTan[c*x] + (8*I)*b^2*c^2*x^2*ArcTan[c*x] - (8*I)*a*b*c^3*x^3*ArcTan[c*x
] - 8*b^2*ArcTan[c*x]^2 + (12*I)*b^2*c*x*ArcTan[c*x]^2 - 24*b^2*c^2*x^2*Arc
Tan[c*x]^2 - (4*I)*b^2*c^3*x^3*ArcTan[c*x]^2 - 16*b^2*c*x*ArcTan[c*x]^3 + (
24*I)*b^2*c*x*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] + 16*b^2*c*x*Ar
cTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] - 48*b^2*c*x*ArcTan[c*x]*Log[1 + E
^((2*I)*ArcTan[c*x])] - (24*I)*b^2*c*x*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTa
n[c*x])] + (24*I)*a^2*c*x*Log[x] + 16*a*b*c*x*Log[c*x] + 16*a*b*c*x*Log[1 +
 c^2*x^2] - (4*I)*b^2*c*x*Log[1 + c^2*x^2] - 24*b^2*c*x*ArcTan[c*x]*PolyLog
[2, E^((-2*I)*ArcTan[c*x])] - 24*b^2*c*x*(-I + ArcTan[c*x])*PolyLog[2, -E^(
(2*I)*ArcTan[c*x])] - (8*I)*b^2*c*x*PolyLog[2, E^((2*I)*ArcTan[c*x])] - 24*
a*b*c*x*PolyLog[2, (-I)*c*x] + 24*a*b*c*x*PolyLog[2, I*c*x] + (12*I)*b^2*c*
x*PolyLog[3, E^((-2*I)*ArcTan[c*x])] - (12*I)*b^2*c*x*PolyLog[3, -E^((2*I)*
ArcTan[c*x])]))/(8*x)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-4i\,a^2c^3d^3x^3 - 12\,a^2c^2d^3x^2 + 12i\,a^2cd^3x + 4\,a^2d^3 + \left(i\,b^2c^3d^3x^3 + 3\,b^2c^2d^3x^2 - 3i\,b^2cd^3x - b^2d^3\right)\log\left(-\right.}{4\,x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(-4*I*a^2*c^3*d^3*x^3 - 12*a^2*c^2*d^3*x^2 + 12*I*a^2*c*d^3*x
+ 4*a^2*d^3 + (I*b^2*c^3*d^3*x^3 + 3*b^2*c^2*d^3*x^2 - 3*I*b^2*c*d^3*x - b^
2*d^3)*log(-(c*x + I)/(c*x - I))^2 + (4*a*b*c^3*d^3*x^3 - 12*I*a*b*c^2*d^3*
x^2 - 12*a*b*c*d^3*x + 4*I*a*b*d^3)*log(-(c*x + I)/(c*x - I)))/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 8.25, size = 1739, normalized size = 4.33

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^2,x)
```

```
[Out] -d^3*a^2/x+3/2*c*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+
I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-3/2*c*
d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2
+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arc
tan(c*x)^2+6*c*d^3*b^2*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+2
*c*d^3*b^2*arctan(c*x)*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-3*c*d^3*b^2*arctan
(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-6*c*d^3*b^2*arctan(c*x)*ln(1+I*(1
+I*c*x)/(c^2*x^2+1)^(1/2))-6*c*d^3*b^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^
2+1)^(1/2))+6*c*d^3*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))
-3*c*d^3*a*b*dilog(1+I*c*x)+3*c*d^3*a*b*dilog(1-I*c*x)+6*I*c*d^3*b^2*polylo
g(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*I*c*d^3*a^2*ln(c*x)-1/2*I*d^3*a^2*c^3*x
^2+3/2*c*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^
2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*ar
ctan(c*x)^2+6*I*c*d^3*a*b*arctan(c*x)*ln(c*x)-I*d^3*a*b*arctan(c*x)*c^3*x^2
+3/2*c*d^3*b^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(
c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-3*I*c*d^3*b^2*ar
ctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+3*I*c*d^3*b^2*arctan(c*x)^2*ln(1+
(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*d^3*a*b*arctan(c*x)*c^2*x-3*c*d^3*a*b*ln(c*x
)*ln(1+I*c*x)+3*c*d^3*a*b*ln(c*x)*ln(1-I*c*x)-3/2*c*d^3*b^2*Pi*csgn(((1+I*c
*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+3/2*c*d^3
*b^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arc
tan(c*x)^2-3/2*c*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))^3*arctan(c*x)^2+3*I*c*d^3*b^2*arctan(c*x)^2*ln(1-(1+I*c*x)
/(c^2*x^2+1)^(1/2))+3*I*c*d^3*b^2*arctan(c*x)^2*ln(c*x)-1/2*I*d^3*b^2*arcta
n(c*x)^2*c^3*x^2-I*c*d^3*a*b*arctan(c*x)-3*c^2*x*a^2*d^3+c*d^3*b^2*arctan(c
*x)-d^3*b^2*arctan(c*x)^2/x-3/2*c*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1
)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*
x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+2*c*d^3*a*b*ln(c*x)+2*c*d^3*a*b*ln(c^2*x
^2+1)-3/2*c*d^3*b^2*Pi*arctan(c*x)^2+I*c*d^3*b^2*ln((1+I*c*x)^2/(c^2*x^2+1)
+1)-3*d^3*b^2*arctan(c*x)^2*c^2*x-2*d^3*a*b*arctan(c*x)/x-2*I*c*d^3*b^2*dil
og(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+6*I*c*d^3*b^2*polylog(3,(1+I*c*x)/(c^2*x^
2+1)^(1/2))+6*I*c*d^3*b^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-3/2*I*c*d^
3*b^2*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+3/2*I*c*d^3*b^2*arctan(c*x)^2+6*I
*c*d^3*b^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I*c*d^3*b^2*dilog((1+I*
c*x)/(c^2*x^2+1)^(1/2))+I*a*b*c^2*d^3*x+I*b^2*c^2*d^3*x*arctan(c*x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2\,(d + c\,d\,x\,1\mathrm{i})^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2/x**2,x)
```

```
[Out] Timed out
```

3.90 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx$

Optimal. Leaf size=416

$$-ic^3d^3x\left(a+b\tan^{-1}(cx)\right)^2+3ibc^2d^3\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)-3ibc^2d^3\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(c\right.$$

```
[Out] -b*c*d^3*(a+b*arctan(c*x))/x+7/2*c^2*d^3*(a+b*arctan(c*x))^2-1/2*d^3*(a+b*a
rctan(c*x))^2/x^2-3*I*b*c^2*d^3*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))
+3*I*b*c^2*d^3*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))+6*c^2*d^3*(a+b*ar
ctan(c*x))^2*arctanh(-1+2/(1+I*c*x))+b^2*c^2*d^3*ln(x)-I*c^3*d^3*x*(a+b*arc
tan(c*x))^2-1/2*b^2*c^2*d^3*ln(c^2*x^2+1)+6*I*b*c^2*d^3*(a+b*arctan(c*x))*l
n(2-2/(1-I*c*x))+3*b^2*c^2*d^3*polylog(2,-1+2/(1-I*c*x))+b^2*c^2*d^3*polylo
g(2,1-2/(1+I*c*x))-3*I*c*d^3*(a+b*arctan(c*x))^2/x-2*I*b*c^2*d^3*(a+b*arcta
n(c*x))*ln(2/(1+I*c*x))+3/2*b^2*c^2*d^3*polylog(3,1-2/(1+I*c*x))-3/2*b^2*c^
2*d^3*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.75, antiderivative size = 416, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 20, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.800, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4918, 266, 36, 29, 31, 4884, 4924, 4868, 2447, 4850, 4988, 4994, 6610}

$$3ibc^2d^3\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-3ibc^2d^3\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+3b^2c^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*d^3*(a + b*ArcTan[c*x]))/x) + (7*c^2*d^3*(a + b*ArcTan[c*x])^2)/2 -
(d^3*(a + b*ArcTan[c*x])^2)/(2*x^2) - ((3*I)*c*d^3*(a + b*ArcTan[c*x])^2)/x
 - I*c^3*d^3*x*(a + b*ArcTan[c*x])^2 - 6*c^2*d^3*(a + b*ArcTan[c*x])^2*ArcT
anh[1 - 2/(1 + I*c*x)] + b^2*c^2*d^3*Log[x] - (2*I)*b*c^2*d^3*(a + b*ArcTan
[c*x])*Log[2/(1 + I*c*x)] - (b^2*c^2*d^3*Log[1 + c^2*x^2])/2 + (6*I)*b*c^2*
d^3*(a + b*ArcTan[c*x])*Log[2 - 2/(1 - I*c*x)] + 3*b^2*c^2*d^3*PolyLog[2, -
1 + 2/(1 - I*c*x)] + b^2*c^2*d^3*PolyLog[2, 1 - 2/(1 + I*c*x)] + (3*I)*b*c^
2*d^3*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] - (3*I)*b*c^2*d^3*(
a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)] + (3*b^2*c^2*d^3*PolyLog[
3, 1 - 2/(1 + I*c*x)])/2 - (3*b^2*c^2*d^3*PolyLog[3, -1 + 2/(1 + I*c*x)])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx=\int\left(-ic^3d^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{x^3}+\frac{3icd^3\left(a+b\tan^{-1}\right.}{x^2}\right.$$

$$=d^3\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}dx+\left(3icd^3\right)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}dx-\left(3c^2d^3\right)\int$$

$$=-\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)^2}{x}-ic^3d^3x\left(a+b\tan^{-1}(cx\right.$$

$$=4c^2d^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{3icd^3\left(a+b\tan^{-1}(cx)\right)^2}{x}$$

$$=-\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{7}{2}c^2d^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$=-\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{7}{2}c^2d^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$=-\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{7}{2}c^2d^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$=-\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{7}{2}c^2d^3\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

Mathematica [A] time = 1.15, size = 500, normalized size = 1.20

$$\frac{1}{2}d^3\left(-2ia^2c^3x-6a^2c^2\log(x)-\frac{6ia^2c}{x}-\frac{a^2}{x^2}-6iabc^2(\text{Li}_2(-icx)-\text{Li}_2(icx))-2iabc^2\left(2cx\tan^{-1}(cx)-\log\left(c^2x^2+1\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] (d^3*(-(a^2/x^2) - ((6*I)*a^2*c)/x - (2*I)*a^2*c^3*x - (2*a*b*(ArcTan[c*x]
+ c*x*(1 + c*x*ArcTan[c*x])))/x^2 - 6*a^2*c^2*Log[x] - (b^2*(2*c*x*ArcTan[c
*x] + (1 + c^2*x^2)*ArcTan[c*x]^2 - 2*c^2*x^2*Log[(c*x)/Sqrt[1 + c^2*x^2]])
)/x^2 - (2*I)*a*b*c^2*(2*c*x*ArcTan[c*x] - Log[1 + c^2*x^2]) - ((6*I)*a*b*c
*(2*ArcTan[c*x] + c*x*(-2*Log[c*x] + Log[1 + c^2*x^2])))/x - (2*I)*b^2*c^2*
(ArcTan[c*x]*((-I + c*x)*ArcTan[c*x] + 2*Log[1 + E^((2*I)*ArcTan[c*x])]) -
I*PolyLog[2, -E^((2*I)*ArcTan[c*x])]) + (6*b^2*c*(ArcTan[c*x]*((-I + c*x)*A
rcTan[c*x] + (2*I)*c*x*Log[1 - E^((2*I)*ArcTan[c*x])]) + c*x*PolyLog[2, E^(
(2*I)*ArcTan[c*x])]))/x - (6*I)*a*b*c^2*(PolyLog[2, (-I)*c*x] - PolyLog[2,
I*c*x]) + 6*b^2*c^2*((I/24)*Pi^3 - ((2*I)/3)*ArcTan[c*x]^3 - ArcTan[c*x]^2*
Log[1 - E^((-2*I)*ArcTan[c*x])] + ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x
])] - I*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] - I*ArcTan[c*x]*Poly
Log[2, -E^((2*I)*ArcTan[c*x])] - PolyLog[3, E^((-2*I)*ArcTan[c*x])]/2 + Pol
yLog[3, -E^((2*I)*ArcTan[c*x])]/2)))/2
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-4i\,a^2c^3d^3x^3-12\,a^2c^2d^3x^2+12i\,a^2cd^3x+4\,a^2d^3+\left(i\,b^2c^3d^3x^3+3\,b^2c^2d^3x^2-3i\,b^2cd^3x-b^2d^3\right)\log\left(-\right.}{4\,x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral(1/4*(-4*I*a^2*c^3*d^3*x^3 - 12*a^2*c^2*d^3*x^2 + 12*I*a^2*c*d^3*x
+ 4*a^2*d^3 + (I*b^2*c^3*d^3*x^3 + 3*b^2*c^2*d^3*x^2 - 3*I*b^2*c*d^3*x - b^
2*d^3)*log(-(c*x + I)/(c*x - I))^2 + (4*a*b*c^3*d^3*x^3 - 12*I*a*b*c^2*d^3*
x^2 - 12*a*b*c*d^3*x + 4*I*a*b*d^3)*log(-(c*x + I)/(c*x - I)))/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 6.75, size = 1840, normalized size = 4.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^3,x)
```

```
[Out] -d^3*a*b*arctan(c*x)/x^2+3/2*I*c^2*d^3*b^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)
-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-2*I*c^3*d^3*a*b*arctan(c*x
)*x-6*I*c*d^3*a*b*arctan(c*x)/x-1/2*d^3*a^2/x^2+3/2*c^2*d^3*b^2*polylog(3,-
(1+I*c*x)^2/(c^2*x^2+1))-6*c^2*d^3*b^2*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/
2))-2*c^2*d^3*b^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*c^2*d^3*b^2*poly
log(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+c^2*d^3*b^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(
1/2))-6*c^2*d^3*b^2*dilog((1+I*c*x)/(c^2*x^2+1)^(1/2))+6*c^2*d^3*b^2*dilog(
1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+c^2*d^3*b^2*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1
)-1/2*d^3*b^2*arctan(c*x)^2/x^2+3/2*c^2*d^3*b^2*arctan(c*x)^2-c*d^3*a*b/x-3
*c^2*d^3*b^2*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-3*c^2*d^3*b^2*
arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*c^2*d^3*b^2*arctan(c*x)^2
*ln((1+I*c*x)^2/(c^2*x^2+1)-1)-3*c^2*d^3*b^2*arctan(c*x)^2*ln(c*x)-c^2*d^3*
a*b*arctan(c*x)-I*c^3*d^3*a^2*x-3*I*c*d^3*a^2/x-3/2*I*c^2*d^3*b^2*arctan(c*
x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)
+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))-3/2*I*
c^2*d^3*b^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1)
)^3*arctan(c*x)^2-3*I*c^2*d^3*a*b*ln(c*x)*ln(1+I*c*x)+3*I*c^2*d^3*a*b*ln(c*
x)*ln(1-I*c*x)-3/2*I*c^2*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+
I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-3*c^2*d^3*a^2*ln(c*x)-2*c^2*d^3*b^
2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+c*d^3*b^2*arctan(c*x)/x*(c^2*x^2+1
)^(1/2)-6*c^2*d^3*a*b*arctan(c*x)*ln(c*x)-I*c^3*d^3*b^2*arctan(c*x)^2*x-3*I
*c*d^3*b^2*arctan(c*x)^2/x-3*I*c^2*d^3*a*b*dilog(1+I*c*x)+3*I*c^2*d^3*a*b*d
ilog(1-I*c*x)+6*I*c^2*d^3*a*b*ln(c*x)-2*I*c^2*d^3*b^2*arctan(c*x)*ln(1+I*(1
+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*c^2*d^3*b^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^
2*x^2+1)^(1/2))-3*I*c^2*d^3*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2
+1))+6*I*c^2*d^3*b^2*arctan(c*x)*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+6*I*c^2*
d^3*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+6*I*c^2*d^3*b^2
*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*c^2*d^3*a*b*ln(c^2*
x^2+1)-3/2*I*c^2*d^3*b^2*arctan(c*x)^2*Pi+3/2*I*c^2*d^3*b^2*Pi*csgn(I*((1+I
*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*
x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2*I*c^2*d^3*b^2*Pi
*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2*I*c^2*d^3*b^2*Pi*csgn(I*((1+I
*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))^2*arctan(c*x)^2-3/2*I*c^2*d^3*b^2*arctan(c*x)^2*Pi*csgn(I*((1+
```

```
I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2
*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^3,x)
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2/x**3,x)
[Out] Timed out
```

3.91 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx$

Optimal. Leaf size=429

$$-bc^3d^3\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)+bc^3d^3\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)+\frac{11}{6}ic^3d^3\left(a+b\tan^{-1}(cx)\right)$$

```
[Out] -1/3*b^2*c^2*d^3/x-1/3*b^2*c^3*d^3*arctan(c*x)-1/3*b*c*d^3*(a+b*arctan(c*x)
)/x^2-3/2*I*c*d^3*(a+b*arctan(c*x))^2/x^2+10/3*I*b^2*c^3*d^3*polylog(2,-1+2
/(1-I*c*x))-1/3*d^3*(a+b*arctan(c*x))^2/x^3-1/2*I*b^2*c^3*d^3*polylog(3,-1+
2/(1+I*c*x))+3*c^2*d^3*(a+b*arctan(c*x))^2/x-3/2*I*b^2*c^3*d^3*ln(c^2*x^2+1
)+2*I*c^3*d^3*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))+3*I*b^2*c^3*d^3*l
n(x)-20/3*b*c^3*d^3*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))-3*I*b*c^2*d^3*(a+b*
arctan(c*x))/x-b*c^3*d^3*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))+b*c^3*d
^3*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))+11/6*I*c^3*d^3*(a+b*arctan(c
*x))^2+1/2*I*b^2*c^3*d^3*polylog(3,1-2/(1+I*c*x))
```

Rubi [A] time = 0.89, antiderivative size = 429, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 17, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {4876, 4852, 4918, 325, 203, 4924, 4868, 2447, 266, 36, 29, 31, 4884, 4850, 4988, 4994, 6610}

$$-bc^3d^3\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+bc^3d^3\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+\frac{10}{3}ib^2c^3$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^4,x]
```

```
[Out] -(b^2*c^2*d^3)/(3*x) - (b^2*c^3*d^3*ArcTan[c*x])/3 - (b*c*d^3*(a + b*ArcTan
[c*x]))/(3*x^2) - ((3*I)*b*c^2*d^3*(a + b*ArcTan[c*x]))/x + ((11*I)/6)*c^3*
d^3*(a + b*ArcTan[c*x])^2 - (d^3*(a + b*ArcTan[c*x])^2)/(3*x^3) - (((3*I)/2
)*c*d^3*(a + b*ArcTan[c*x])^2)/x^2 + (3*c^2*d^3*(a + b*ArcTan[c*x])^2)/x -
(2*I)*c^3*d^3*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + (3*I)*b^2*
c^3*d^3*Log[x] - ((3*I)/2)*b^2*c^3*d^3*Log[1 + c^2*x^2] - (20*b*c^3*d^3*(a
+ b*ArcTan[c*x])*Log[2 - 2/(1 - I*c*x)])/3 + ((10*I)/3)*b^2*c^3*d^3*PolyLog
[2, -1 + 2/(1 - I*c*x)] - b*c^3*d^3*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1
 + I*c*x)] + b*c^3*d^3*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)] +
 (I/2)*b^2*c^3*d^3*PolyLog[3, 1 - 2/(1 + I*c*x)] - (I/2)*b^2*c^3*d^3*PolyLo
g[3, -1 + 2/(1 + I*c*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx = \int \left(\frac{d^3 \left(a+b\tan^{-1}(cx)\right)^2}{x^4} + \frac{3icd^3 \left(a+b\tan^{-1}(cx)\right)^2}{x^3} - \frac{3c^2d^3 \left(a+b\tan^{-1}(\right.}{x^2}\right.$$

$$= d^3 \int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx + \left(3icd^3\right) \int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx - \left(3c^2d^3\right) \int$$

$$= -\frac{d^3 \left(a+b\tan^{-1}(cx)\right)^2}{3x^3} - \frac{3icd^3 \left(a+b\tan^{-1}(cx)\right)^2}{2x^2} + \frac{3c^2d^3 \left(a+b\tan^{-1}(cx\right.}{x}$$

$$= 3ic^3d^3 \left(a+b\tan^{-1}(cx)\right)^2 - \frac{d^3 \left(a+b\tan^{-1}(cx)\right)^2}{3x^3} - \frac{3icd^3 \left(a+b\tan^{-1}(cx)\right)}{2x^2}$$

$$= -\frac{bcd^3 \left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{3ibc^2d^3 \left(a+b\tan^{-1}(cx)\right)}{x} + \frac{11}{6}ic^3d^3 \left(a+b\tan^{-}\right.$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{bcd^3 \left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{3ibc^2d^3 \left(a+b\tan^{-1}(cx)\right)}{x} + \frac{11}{6}ic^3d^3 \left(\right.$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{1}{3}b^2c^3d^3\tan^{-1}(cx) - \frac{bcd^3 \left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{3ibc^2d^3 \left(a+b\tan\right.}{x}$$

$$= -\frac{b^2c^2d^3}{3x} - \frac{1}{3}b^2c^3d^3\tan^{-1}(cx) - \frac{bcd^3 \left(a+b\tan^{-1}(cx)\right)}{3x^2} - \frac{3ibc^2d^3 \left(a+b\tan\right.}{x}$$

Mathematica [A] time = 0.80, size = 595, normalized size = 1.39

$$\frac{d^3 \left(-24ia^2c^3x^3\log(x) + 72a^2c^2x^2 - 36ia^2cx - 8a^2 + 24abc^3x^3\text{Li}_2(-icx) - 24abc^3x^3\text{Li}_2(icx) - 160abc^3x^3\log(cx)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^4,x]
```

```
[Out] (d^3*(-8*a^2 - (36*I)*a^2*c*x - 8*a*b*c*x + 72*a^2*c^2*x^2 - (72*I)*a*b*c^2
*x^2 - 8*b^2*c^2*x^2 - b^2*c^3*Pi^3*x^3 - 16*a*b*ArcTan[c*x] - (72*I)*a*b*c
*x*ArcTan[c*x] - 8*b^2*c*x*ArcTan[c*x] + 144*a*b*c^2*x^2*ArcTan[c*x] - (72*
I)*b^2*c^2*x^2*ArcTan[c*x] - (72*I)*a*b*c^3*x^3*ArcTan[c*x] - 8*b^2*c^3*x^3
*ArcTan[c*x] - 8*b^2*ArcTan[c*x]^2 - (36*I)*b^2*c*x*ArcTan[c*x]^2 + 72*b^2*
c^2*x^2*ArcTan[c*x]^2 + (44*I)*b^2*c^3*x^3*ArcTan[c*x]^2 + 16*b^2*c^3*x^3*A
rcTan[c*x]^3 - (24*I)*b^2*c^3*x^3*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*
x])] - 160*b^2*c^3*x^3*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + (24*I)*
b^2*c^3*x^3*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] - (24*I)*a^2*c^3*x
^3*Log[x] - 160*a*b*c^3*x^3*Log[c*x] + (72*I)*b^2*c^3*x^3*Log[(c*x)/Sqrt[1
+ c^2*x^2]] + 80*a*b*c^3*x^3*Log[1 + c^2*x^2] + 24*b^2*c^3*x^3*ArcTan[c*x]*
PolyLog[2, E^((-2*I)*ArcTan[c*x])] + 24*b^2*c^3*x^3*ArcTan[c*x]*PolyLog[2,
-E^((2*I)*ArcTan[c*x])] + (80*I)*b^2*c^3*x^3*PolyLog[2, E^((2*I)*ArcTan[c*x
])] + 24*a*b*c^3*x^3*PolyLog[2, (-I)*c*x] - 24*a*b*c^3*x^3*PolyLog[2, I*c*x
] - (12*I)*b^2*c^3*x^3*PolyLog[3, E^((-2*I)*ArcTan[c*x])] + (12*I)*b^2*c^3*
x^3*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/(24*x^3)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-4i\,a^2c^3d^3x^3 - 12\,a^2c^2d^3x^2 + 12i\,a^2cd^3x + 4\,a^2d^3 + \left(i\,b^2c^3d^3x^3 + 3\,b^2c^2d^3x^2 - 3i\,b^2cd^3x - b^2d^3\right)\log\left(-\right.}{4\,x^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^4,x, algorithm="fricas")
```

```
[Out] integral(1/4*(-4*I*a^2*c^3*d^3*x^3 - 12*a^2*c^2*d^3*x^2 + 12*I*a^2*c*d^3*x
+ 4*a^2*d^3 + (I*b^2*c^3*d^3*x^3 + 3*b^2*c^2*d^3*x^2 - 3*I*b^2*c*d^3*x - b^
2*d^3)*log(-(c*x + I)/(c*x - I))^2 + (4*a*b*c^3*d^3*x^3 - 12*I*a*b*c^2*d^3*
x^2 - 12*a*b*c*d^3*x + 4*I*a*b*d^3)*log(-(c*x + I)/(c*x - I)))/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 8.40, size = 1814, normalized size = 4.23

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^4,x)
```

```
[Out] 3*c^2*d^3*a^2/x-1/3*d^3*b^2*arctan(c*x)^2/x^3+6*c^2*d^3*a*b*arctan(c*x)/x+c
^3*d^3*a*b*ln(c*x)*ln(1+I*c*x)-c^3*d^3*a*b*ln(c*x)*ln(1-I*c*x)+I*c^3*d^3*b^
2*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+1/2*c^3*d^3*b^2*Pi*csgn(((1+I
*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-1/2*c^3
*d^3*b^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2
*arctan(c*x)^2+1/2*c^3*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*
c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-3*I*c^2*d^3*a*b/x-3/2*I*c*d^3*b^2*ar
ctan(c*x)^2/x^2-3*I*c^2*d^3*b^2*arctan(c*x)/x-I*c^3*d^3*b^2*arctan(c*x)^2*l
n(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-I*c^3*d^3*b^2*arctan(c*x)^2*ln(1+(1+I*c*x)
/(c^2*x^2+1)^(1/2))-1/3*I*c^3*d^3*b^2/(I*c*x-(c^2*x^2+1)^(1/2)+1)*(c^2*x^2+
1)^(1/2)-I*c^3*d^3*b^2*arctan(c*x)^2*ln(c*x)+8/3*b^2*c^3*d^3*arctan(c*x)-1/
3*d^3*a^2/x^3-1/2*c^3*d^3*b^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I
*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1
/2*c^3*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(
c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*c^3*d^3*b^2*
Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1
+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/2*c^3
*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))
*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x
)^2-2*I*c^3*d^3*a*b*arctan(c*x)*ln(c*x)-3*I*c*d^3*a*b*arctan(c*x)/x^2+1/3*I
*c^3*d^3*b^2/(I*c*x+(c^2*x^2+1)^(1/2)+1)*(c^2*x^2+1)^(1/2)-3*I*c^3*d^3*a*b*
arctan(c*x)+1/2*c^3*d^3*b^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/(
(1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))*arctan(c*x)^2+1/2*I*c^3*d^3*b^2*polylog(3,-(1+I*c*x)^2/(c^
2*x^2+1))-20/3*I*c^3*d^3*b^2*dilog((1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*c^3*d^3
*b^2*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*I*c^3*d^3*b^2*ln(1+(1+I*c*x)
/(c^2*x^2+1)^(1/2))+3*I*c^3*d^3*b^2*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)-2*I*c
^3*d^3*b^2*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+20/3*I*c^3*d^3*b^2*dilog(
1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-3/2*I*c*d^3*a^2/x^2+11/6*I*c^3*d^3*b^2*arcta
n(c*x)^2-I*c^3*d^3*a^2*ln(c*x)-c^3*d^3*a*b*dilog(1-I*c*x)-20/3*c^3*d^3*b^2*
arctan(c*x)*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*c^3*d^3*b^2*arctan(c*x)*pol
ylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2*c^3*d^3*b^2*Pi*arctan(c*x)^2+3*c^2*
d^3*b^2*arctan(c*x)^2/x-1/3*c*d^3*b^2*arctan(c*x)/x^2-20/3*c^3*d^3*a*b*ln(c
*x)+10/3*c^3*d^3*a*b*ln(c^2*x^2+1)+c^3*d^3*a*b*dilog(1+I*c*x)-1/3*c*d^3*a*b
/x^2-2/3*d^3*a*b*arctan(c*x)/x^3-2*c^3*d^3*b^2*arctan(c*x)*polylog(2,-(1+I*
```

```
c*x)/(c^2*x^2+1)^(1/2))+c^3*d^3*b^2*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2
*x^2+1))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^4,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^3}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^4,x)
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2/x**4,x)
[Out] Timed out
```

3.92 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^5}\,dx$

Optimal. Leaf size=293

$$-4iabc^4d^3\log(x)-4ibc^4d^3\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)+\frac{7bc^3d^3\left(a+b\tan^{-1}(cx)\right)}{2x}-\frac{ibc^2d^3\left(a+b\tan^{-1}(cx)\right)}{x^2}-$$

```
[Out] -1/12*b^2*c^2*d^3/x^2-I*b^2*c^3*d^3/x-I*b^2*c^4*d^3*arctan(c*x)-1/6*b*c*d^3
*(a+b*arctan(c*x))/x^3-I*b*c^2*d^3*(a+b*arctan(c*x))/x^2+7/2*b*c^3*d^3*(a+b
*arctan(c*x))/x-1/4*d^3*(1+I*c*x)^4*(a+b*arctan(c*x))^2/x^4-4*I*a*b*c^4*d^3
*ln(x)-11/3*b^2*c^4*d^3*ln(x)-4*I*b*c^4*d^3*(a+b*arctan(c*x))*ln(2/(1-I*c*x
))+11/6*b^2*c^4*d^3*ln(c^2*x^2+1)+2*b^2*c^4*d^3*polylog(2,-I*c*x)-2*b^2*c^4
*d^3*polylog(2,I*c*x)-2*b^2*c^4*d^3*polylog(2,1-2/(1-I*c*x))
```

Rubi [A] time = 0.32, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {37, 4874, 4852, 266, 44, 325, 203, 36, 29, 31, 4848, 2391, 4854, 2402, 2315}

$$2b^2c^4d^3\text{PolyLog}(2,-icx)-2b^2c^4d^3\text{PolyLog}(2,icx)-2b^2c^4d^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)-\frac{ibc^2d^3\left(a+b\tan^{-1}(cx)\right)}{x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^5,x]
```

```
[Out] -(b^2*c^2*d^3)/(12*x^2) - (I*b^2*c^3*d^3)/x - I*b^2*c^4*d^3*ArcTan[c*x] - (
b*c*d^3*(a + b*ArcTan[c*x]))/(6*x^3) - (I*b*c^2*d^3*(a + b*ArcTan[c*x]))/x^
2 + (7*b*c^3*d^3*(a + b*ArcTan[c*x]))/(2*x) - (d^3*(1 + I*c*x)^4*(a + b*Arc
Tan[c*x])^2)/(4*x^4) - (4*I)*a*b*c^4*d^3*Log[x] - (11*b^2*c^4*d^3*Log[x])/3
 - (4*I)*b*c^4*d^3*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)] + (11*b^2*c^4*d^3
*Log[1 + c^2*x^2])/6 + 2*b^2*c^4*d^3*PolyLog[2, (-I)*c*x] - 2*b^2*c^4*d^3*P
olyLog[2, I*c*x] - 2*b^2*c^4*d^3*PolyLog[2, 1 - 2/(1 - I*c*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
```

```
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4874

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_.) + (e_
.)*(x_))^(q_), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dis
t[(a + b*ArcTan[c*x])^p, u, x] - Dist[b*c*p, Int[ExpandIntegrand[(a + b*Arc
Tan[c*x])^(p - 1), u/(1 + c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f,
 q}, x] && IGtQ[p, 1] && EqQ[c^2*d^2 + e^2, 0] && IntegersQ[m, q] && NeQ[m,
 -1] && NeQ[q, -1] && ILtQ[m + q + 1, 0] && LtQ[m*q, 0]
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^5}\,dx = -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{4x^4} - (2bc)\int\left(-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{4x^4} - \frac{ic}{}\right.$$

$$= -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{4x^4} + \frac{1}{2}\left(bcd^3\right)\int\frac{a+b\tan^{-1}(cx)}{x^4}\,dx + \left(2i\right.$$

$$= -\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{6x^3} - \frac{ibc^2d^3\left(a+b\tan^{-1}(cx)\right)}{x^2} + \frac{7bc^3d^3\left(a+b\tan\right.}{2x}$$

$$= -\frac{ib^2c^3d^3}{x} - \frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{6x^3} - \frac{ibc^2d^3\left(a+b\tan^{-1}(cx)\right)}{x^2} + \frac{7bc^3d^3}{}$$

$$= -\frac{ib^2c^3d^3}{x} - ib^2c^4d^3\tan^{-1}(cx) - \frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{6x^3} - \frac{ibc^2d^3\left(a+b\,\text{t}\right.}{x^2}$$

$$= -\frac{b^2c^2d^3}{12x^2} - \frac{ib^2c^3d^3}{x} - ib^2c^4d^3\tan^{-1}(cx) - \frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{6x^3} - \frac{ibc^2d}{}$$

Mathematica [A] time = 0.90, size = 322, normalized size = 1.10

$$\frac{d^3\left(12ia^2c^3x^3+18a^2c^2x^2-12ia^2cx-3a^2-48iabc^4x^4\log(cx)+42abc^3x^3-12iabc^2x^2+24iabc^4x^4\log\left(c^2x^2+\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^5,x]
```

```
[Out] (d^3*(-3*a^2 - (12*I)*a^2*c*x - 2*a*b*c*x + 18*a^2*c^2*x^2 - (12*I)*a*b*c^2
*x^2 - b^2*c^2*x^2 + (12*I)*a^2*c^3*x^3 + 42*a*b*c^3*x^3 - (12*I)*b^2*c^3*x
^3 - b^2*c^4*x^4 - 3*b^2*(-I + c*x)^4*ArcTan[c*x]^2 + 2*b*ArcTan[c*x]*(b*c*
x*(-1 - (6*I)*c*x + 21*c^2*x^2 - (6*I)*c^3*x^3) + 3*a*(-1 - (4*I)*c*x + 6*c
^2*x^2 + (4*I)*c^3*x^3 + 7*c^4*x^4) - (24*I)*b*c^4*x^4*Log[1 - E^((2*I)*Arc
Tan[c*x])]) - (48*I)*a*b*c^4*x^4*Log[c*x] - 44*b^2*c^4*x^4*Log[(c*x)/Sqrt[1
 + c^2*x^2]] + (24*I)*a*b*c^4*x^4*Log[1 + c^2*x^2] - 24*b^2*c^4*x^4*PolyLog
[2, E^((2*I)*ArcTan[c*x])]))/(12*x^4)
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\frac{16\,x^4\text{integral}\left(\frac{-4i\,a^2c^5d^3x^5-12\,a^2c^4d^3x^4+8i\,a^2c^3d^3x^3-8\,a^2c^2d^3x^2+12i\,a^2cd^3x+4\,a^2d^3+\left(4\,abc^5d^3x^5-4\left(3i\,ab-b^2\right)c^4d^3x^4-\left(8\,ab+6i\,b^2\right)c^3d^3x^3-\right.}{4\left(c^2x^7+x^5\right)}\right.}{16}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^5,x, algorithm="fricas")
```

```
[Out] 1/16*(16*x^4*integral(1/4*(-4*I*a^2*c^5*d^3*x^5 - 12*a^2*c^4*d^3*x^4 + 8*I*
a^2*c^3*d^3*x^3 - 8*a^2*c^2*d^3*x^2 + 12*I*a^2*c*d^3*x + 4*a^2*d^3 + (4*a*b
*c^5*d^3*x^5 - 4*(3*I*a*b - b^2)*c^4*d^3*x^4 - (8*a*b + 6*I*b^2)*c^3*d^3*x^
3 - 4*(2*I*a*b + b^2)*c^2*d^3*x^2 - (12*a*b - I*b^2)*c*d^3*x + 4*I*a*b*d^3)
*log(-(c*x + I)/(c*x - I)))/(c^2*x^7 + x^5), x) + (-4*I*b^2*c^3*d^3*x^3 - 6
*b^2*c^2*d^3*x^2 + 4*I*b^2*c*d^3*x + b^2*d^3)*log(-(c*x + I)/(c*x - I))^2)/
x^4
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.12, size = 757, normalized size = 2.58

$$-\frac{d^3a^2}{4x^4}-\frac{2ic\,d^3ab\arctan(cx)}{x^3}+\frac{2ic^3d^3ab\arctan(cx)}{x}-\frac{b^2c^2d^3}{12x^2}-\frac{ic^2d^3ab}{x^2}+\frac{11b^2c^4d^3\ln\left(c^2x^2+1\right)}{6}+c^4d^3b^2\ln(cx+i)\ln$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^5,x)
```

```
[Out] -I*b^2*c^3*d^3/x-I*b^2*c^4*d^3*arctan(c*x)-1/4*d^3*a^2/x^4-2*I*c*d^3*a*b*ar
ctan(c*x)/x^3+2*I*c^3*d^3*a*b*arctan(c*x)/x-1/12*b^2*c^2*d^3/x^2+11/6*b^2*c
^4*d^3*ln(c^2*x^2+1)-c^4*d^3*b^2*ln(c*x-I)*ln(c^2*x^2+1)+c^4*d^3*b^2*ln(c*x
-I)*ln(-1/2*I*(I+c*x))+7/2*c^3*d^3*a*b/x-1/6*c*d^3*a*b/x^3+7/2*c^3*d^3*b^2*
arctan(c*x)/x-1/2*d^3*a*b*arctan(c*x)/x^4-I*c*d^3*a^2/x^3+3/2*c^2*d^3*b^2*a
rctan(c*x)^2/x^2+I*c^3*d^3*a^2/x+7/2*c^4*d^3*a*b*arctan(c*x)+2*c^4*d^3*b^2*
ln(c*x)*ln(1+I*c*x)-2*c^4*d^3*b^2*ln(c*x)*ln(1-I*c*x)+c^4*d^3*b^2*ln(I+c*x)
*ln(c^2*x^2+1)-c^4*d^3*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))-1/6*c*d^3*b^2*arctan
(c*x)/x^3+I*c^3*d^3*b^2*arctan(c*x)^2/x+3*c^2*d^3*a*b*arctan(c*x)/x^2+2*I*c
^4*d^3*b^2*arctan(c*x)*ln(c^2*x^2+1)-4*I*c^4*d^3*b^2*arctan(c*x)*ln(c*x)+2*
I*c^4*d^3*a*b*ln(c^2*x^2+1)-4*I*c^4*d^3*a*b*ln(c*x)-I*c*d^3*b^2*arctan(c*x)
^2/x^3-I*c^2*d^3*b^2*arctan(c*x)/x^2-I*c^2*d^3*a*b/x^2-1/2*c^4*d^3*b^2*ln(I
+c*x)^2+1/2*c^4*d^3*b^2*ln(c*x-I)^2-11/3*c^4*d^3*b^2*ln(c*x)+7/4*c^4*d^3*b^
2*arctan(c*x)^2+3/2*c^2*d^3*a^2/x^2-1/4*d^3*b^2*arctan(c*x)^2/x^4+2*c^4*d^3
*b^2*dilog(1+I*c*x)-2*c^4*d^3*b^2*dilog(1-I*c*x)+c^4*d^3*b^2*dilog(-1/2*I*(
I+c*x))-c^4*d^3*b^2*dilog(1/2*I*(c*x-I))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^5,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2\,{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}{x^5} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^5,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^5, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2/x**5,x)
```

```
[Out] Timed out
```

3.93 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^6}\,dx$

Optimal. Leaf size=384

$$\frac{12}{5}abc^5d^3\log(x)+\frac{12}{5}bc^5d^3\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)+\frac{5ibc^4d^3\left(a+b\tan^{-1}(cx)\right)}{2x}+\frac{6bc^3d^3\left(a+b\tan^{-1}(cx)\right)}{5x^2}-$$

```
[Out] -1/30*b^2*c^2*d^3/x^3+5/2*I*b*c^4*d^3*(a+b*arctan(c*x))/x+13/10*b^2*c^4*d^3
/x+13/10*b^2*c^5*d^3*arctan(c*x)-1/10*b*c*d^3*(a+b*arctan(c*x))/x^4-3*I*b^2
*c^5*d^3*ln(x)+6/5*b*c^3*d^3*(a+b*arctan(c*x))/x^2-1/2*I*b*c^2*d^3*(a+b*arc
tan(c*x))/x^3-1/5*d^3*(1+I*c*x)^4*(a+b*arctan(c*x))^2/x^5-1/4*I*b^2*c^3*d^3
/x^2+12/5*a*b*c^5*d^3*ln(x)+6/5*I*b^2*c^5*d^3*polylog(2,-I*c*x)+12/5*b*c^5*
d^3*(a+b*arctan(c*x))*ln(2/(1-I*c*x))-6/5*I*b^2*c^5*d^3*polylog(2,I*c*x)-6/
5*I*b^2*c^5*d^3*polylog(2,1-2/(1-I*c*x))+3/2*I*b^2*c^5*d^3*ln(c^2*x^2+1)+1/
20*I*c*d^3*(1+I*c*x)^4*(a+b*arctan(c*x))^2/x^4
```

Rubi [A] time = 0.37, antiderivative size = 384, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {45, 37, 4874, 4852, 325, 203, 266, 44, 36, 29, 31, 4848, 2391, 4854, 2402, 2315}

$$\frac{6}{5}ib^2c^5d^3\text{PolyLog}(2,-icx)-\frac{6}{5}ib^2c^5d^3\text{PolyLog}(2,icx)-\frac{6}{5}ib^2c^5d^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)+\frac{6bc^3d^3\left(a+b\tan^{-1}(cx)\right)}{5x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^6,x]
```

```
[Out] -(b^2*c^2*d^3)/(30*x^3) - ((I/4)*b^2*c^3*d^3)/x^2 + (13*b^2*c^4*d^3)/(10*x)
 + (13*b^2*c^5*d^3*ArcTan[c*x])/10 - (b*c*d^3*(a + b*ArcTan[c*x]))/(10*x^4)
 - ((I/2)*b*c^2*d^3*(a + b*ArcTan[c*x]))/x^3 + (6*b*c^3*d^3*(a + b*ArcTan[c
*x]))/(5*x^2) + (((5*I)/2)*b*c^4*d^3*(a + b*ArcTan[c*x]))/x - (d^3*(1 + I*c
*x)^4*(a + b*ArcTan[c*x])^2)/(5*x^5) + ((I/20)*c*d^3*(1 + I*c*x)^4*(a + b*A
rcTan[c*x])^2)/x^4 + (12*a*b*c^5*d^3*Log[x])/5 - (3*I)*b^2*c^5*d^3*Log[x] +
 (12*b*c^5*d^3*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/5 + ((3*I)/2)*b^2*c^
5*d^3*Log[1 + c^2*x^2] + ((6*I)/5)*b^2*c^5*d^3*PolyLog[2, (-I)*c*x] - ((6*I
)/5)*b^2*c^5*d^3*PolyLog[2, I*c*x] - ((6*I)/5)*b^2*c^5*d^3*PolyLog[2, 1 - 2
/(1 - I*c*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
```

```
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 45

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*S
implify[m + n + 2])/((b*c - a*d)*(m + 1)), Int[(a + b*x)^Simplify[m + 1]*(c
 + d*x)^n, x], x] /; FreeQ[{a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && I
LtQ[Simplify[m + n + 2], 0] && NeQ[m, -1] &&  !(LtQ[m, -1] && LtQ[n, -1] &&
 (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && (SumSimpler
Q[m, 1] ||  !SumSimplerQ[n, 1])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4874

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_.) + (e_
.)*(x_))^(q_), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dis
t[(a + b*ArcTan[c*x])^p, u, x] - Dist[b*c*p, Int[ExpandIntegrand[(a + b*Arc
Tan[c*x])^(p - 1), u/(1 + c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f,
 q}, x] && IGtQ[p, 1] && EqQ[c^2*d^2 + e^2, 0] && IntegersQ[m, q] && NeQ[m,
 -1] && NeQ[q, -1] && ILtQ[m + q + 1, 0] && LtQ[m*q, 0]
```

Rubi steps

$$\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^6}\,dx = -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{5x^5}+\frac{icd^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{20x^4}-(2bc$$

$$= -\frac{d^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{5x^5}+\frac{icd^3(1+icx)^4\left(a+b\tan^{-1}(cx)\right)^2}{20x^4}+\frac{1}{5}(2$$

$$= -\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{10x^4}-\frac{ibc^2d^3\left(a+b\tan^{-1}(cx)\right)}{2x^3}+\frac{6bc^3d^3\left(a+b\tan^{-1}(\right.}{5x^2}$$

$$= -\frac{b^2c^2d^3}{30x^3}+\frac{6b^2c^4d^3}{5x}-\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{10x^4}-\frac{ibc^2d^3\left(a+b\tan^{-1}(cx)\right)}{2x^3}+$$

$$= -\frac{b^2c^2d^3}{30x^3}+\frac{13b^2c^4d^3}{10x}+\frac{6}{5}b^2c^5d^3\tan^{-1}(cx)-\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{10x^4}-\frac{ibc^2d}{}$$

$$= -\frac{b^2c^2d^3}{30x^3}-\frac{ib^2c^3d^3}{4x^2}+\frac{13b^2c^4d^3}{10x}+\frac{13}{10}b^2c^5d^3\tan^{-1}(cx)-\frac{bcd^3\left(a+b\tan^{-1}(\right.}{10x^4}$$

Mathematica [A] time = 1.40, size = 363, normalized size = 0.95

$$\frac{d^3\left(30ia^2c^3x^3+60a^2c^2x^2-45ia^2cx-12a^2+144abc^5x^5\log(cx)+150iabc^4x^4+72abc^3x^3-30iabc^2x^2-72abc^5x^5\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^6,x]
```

```
[Out] (d^3*(-12*a^2 - (45*I)*a^2*c*x - 6*a*b*c*x + 60*a^2*c^2*x^2 - (30*I)*a*b*c^
2*x^2 - 2*b^2*c^2*x^2 + (30*I)*a^2*c^3*x^3 + 72*a*b*c^3*x^3 - (15*I)*b^2*c^
3*x^3 + (150*I)*a*b*c^4*x^4 + 78*b^2*c^4*x^4 - (15*I)*b^2*c^5*x^5 + (3*I)*b
^2*(-I + c*x)^4*(4*I + c*x)*ArcTan[c*x]^2 + 6*b*ArcTan[c*x]*(b*c*x*(-1 - (5
*I)*c*x + 12*c^2*x^2 + (25*I)*c^3*x^3 + 13*c^4*x^4) + a*(-4 - (15*I)*c*x +
20*c^2*x^2 + (10*I)*c^3*x^3 + (25*I)*c^5*x^5) + 24*b*c^5*x^5*Log[1 - E^((2*
I)*ArcTan[c*x])]) + 144*a*b*c^5*x^5*Log[c*x] - (180*I)*b^2*c^5*x^5*Log[(c*x
)/Sqrt[1 + c^2*x^2]] - 72*a*b*c^5*x^5*Log[1 + c^2*x^2] - (72*I)*b^2*c^5*x^5
*PolyLog[2, E^((2*I)*ArcTan[c*x])]))/(60*x^5)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\frac{80\,x^5\text{integral}\left(\frac{-20i\,a^2c^5d^3x^5-60\,a^2c^4d^3x^4+40i\,a^2c^3d^3x^3-40\,a^2c^2d^3x^2+60i\,a^2cd^3x+20\,a^2d^3+\left(20\,abc^5d^3x^5-10\left(6i\,ab-b^2\right)c^4d^3x^4-\left(40\,ab+20i\,b^2\right.\right.}{20\left(c^2x^8+x^6\right)}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^6,x, algorithm="fricas")
```

```
[Out] 1/80*(80*x^5*integral(1/20*(-20*I*a^2*c^5*d^3*x^5 - 60*a^2*c^4*d^3*x^4 + 40
*I*a^2*c^3*d^3*x^3 - 40*a^2*c^2*d^3*x^2 + 60*I*a^2*c*d^3*x + 20*a^2*d^3 + (
20*a*b*c^5*d^3*x^5 - 10*(6*I*a*b - b^2)*c^4*d^3*x^4 - (40*a*b + 20*I*b^2)*c
^3*d^3*x^3 - 5*(8*I*a*b + 3*b^2)*c^2*d^3*x^2 - (60*a*b - 4*I*b^2)*c*d^3*x +
 20*I*a*b*d^3)*log(-(c*x + I)/(c*x - I)))/(c^2*x^8 + x^6), x) + (-10*I*b^2*
c^3*d^3*x^3 - 20*b^2*c^2*d^3*x^2 + 15*I*b^2*c*d^3*x + 4*b^2*d^3)*log(-(c*x
+ I)/(c*x - I))^2)/x^5
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^6,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.12, size = 816, normalized size = 2.12

$$-\frac{d^3a^2}{5x^5}-\frac{3ic^5d^3b^2\ln(cx-i)\ln\left(c^2x^2+1\right)}{5}+\frac{3ic^5d^3b^2\ln(cx-i)\ln\left(-\frac{i(cx+i)}{2}\right)}{5}+\frac{6ic^5d^3b^2\ln(cx)\ln(icx+1)}{5}-\frac{6ic^5d^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^6,x)
```

```
[Out] -1/5*d^3*a^2/x^5-1/10*c*d^3*b^2*arctan(c*x)/x^4+6/5*c^3*d^3*b^2*arctan(c*x)
/x^2+c^2*d^3*b^2*arctan(c*x)^2/x^3+12/5*c^5*d^3*b^2*arctan(c*x)*ln(c*x)-6/5
*c^5*d^3*b^2*arctan(c*x)*ln(c^2*x^2+1)-2/5*d^3*a*b*arctan(c*x)/x^5-1/10*c*d
^3*a*b/x^4+12/5*c^5*d^3*a*b*ln(c*x)-6/5*c^5*d^3*a*b*ln(c^2*x^2+1)+6/5*c^3*d
^3*a*b/x^2-6/5*I*c^5*d^3*b^2*ln(c*x)*ln(1-I*c*x)+3/5*I*c^5*d^3*b^2*ln(I+c*x
)*ln(c^2*x^2+1)+1/2*I*c^3*d^3*b^2*arctan(c*x)^2/x^2-3/4*I*c*d^3*b^2*arctan(
c*x)^2/x^4-1/2*I*c^2*d^3*b^2*arctan(c*x)/x^3+5/2*I*c^4*d^3*b^2*arctan(c*x)/
x+5/2*I*c^5*d^3*a*b*arctan(c*x)-1/2*I*c^2*d^3*a*b/x^3+5/2*I*c^4*d^3*a*b/x-3
/5*I*c^5*d^3*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))-3/5*I*c^5*d^3*b^2*ln(c*x-I)*ln
(c^2*x^2+1)+3/5*I*c^5*d^3*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+2*c^2*d^3*a*b*ar
ctan(c*x)/x^3+6/5*I*c^5*d^3*b^2*ln(c*x)*ln(1+I*c*x)-3/4*I*c*d^3*a^2/x^4+1/2
*I*c^3*d^3*a^2/x^2+6/5*I*c^5*d^3*b^2*dilog(1+I*c*x)-6/5*I*c^5*d^3*b^2*dilog
```

```
(1-I*c*x)-3/10*I*c^5*d^3*b^2*ln(I+c*x)^2-3/5*I*c^5*d^3*b^2*dilog(1/2*I*(c*x
-I))+3/10*I*c^5*d^3*b^2*ln(c*x-I)^2+3/5*I*c^5*d^3*b^2*dilog(-1/2*I*(I+c*x))
-3*I*c^5*d^3*b^2*ln(c*x)-1/4*I*b^2*c^3*d^3/x^2+I*c^3*d^3*a*b*arctan(c*x)/x^
2-3/2*I*c*d^3*a*b*arctan(c*x)/x^4-1/5*d^3*b^2*arctan(c*x)^2/x^5+c^2*d^3*a^2
/x^3+3/2*I*b^2*c^5*d^3*ln(c^2*x^2+1)+5/4*I*c^5*d^3*b^2*arctan(c*x)^2-1/30*b
^2*c^2*d^3/x^3+13/10*b^2*c^4*d^3/x+13/10*b^2*c^5*d^3*arctan(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^6,x, algorithm="maxima")
```

```
[Out] I*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*a*b*c^3*d^3 - ((c^2*log(c^2*x
^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*a*b*c^2*d^3 + 1/2*I*
((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*a*b*c*d^3
 - 1/10*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*c
+ 4*arctan(c*x)/x^5)*a*b*d^3 + 1/2*I*a^2*c^3*d^3/x^2 + a^2*c^2*d^3/x^3 - 3/
4*I*a^2*c*d^3/x^4 - 1/5*a^2*d^3/x^5 - 1/320*(320*I*x^5*integrate(1/80*(60*(
b^2*c^5*d^3*x^5 - 2*b^2*c^3*d^3*x^3 - 3*b^2*c*d^3*x)*arctan(c*x)^2 + 5*(b^2
*c^5*d^3*x^5 - 2*b^2*c^3*d^3*x^3 - 3*b^2*c*d^3*x)*log(c^2*x^2 + 1)^2 + 2*(3
0*b^2*c^4*d^3*x^4 - 19*b^2*c^2*d^3*x^2)*arctan(c*x) - (10*b^2*c^5*d^3*x^5 -
 35*b^2*c^3*d^3*x^3 + 4*b^2*c*d^3*x + 20*(3*b^2*c^4*d^3*x^4 + 2*b^2*c^2*d^3
*x^2 - b^2*d^3)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^8 + x^6), x) + 320*x^
5*integrate(1/80*(60*(3*b^2*c^4*d^3*x^4 + 2*b^2*c^2*d^3*x^2 - b^2*d^3)*arct
an(c*x)^2 + 5*(3*b^2*c^4*d^3*x^4 + 2*b^2*c^2*d^3*x^2 - b^2*d^3)*log(c^2*x^2
 + 1)^2 - 2*(10*b^2*c^5*d^3*x^5 - 35*b^2*c^3*d^3*x^3 + 4*b^2*c*d^3*x)*arcta
n(c*x) - (30*b^2*c^4*d^3*x^4 - 19*b^2*c^2*d^3*x^2 - 20*(b^2*c^5*d^3*x^5 - 2
*b^2*c^3*d^3*x^3 - 3*b^2*c*d^3*x)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^8 +
 x^6), x) + (-40*I*b^2*c^3*d^3*x^3 - 80*b^2*c^2*d^3*x^2 + 60*I*b^2*c*d^3*x
+ 16*b^2*d^3)*arctan(c*x)^2 + (40*b^2*c^3*d^3*x^3 - 80*I*b^2*c^2*d^3*x^2 -
60*b^2*c*d^3*x + 16*I*b^2*d^3)*arctan(c*x)*log(c^2*x^2 + 1) + (10*I*b^2*c^3
*d^3*x^3 + 20*b^2*c^2*d^3*x^2 - 15*I*b^2*c*d^3*x - 4*b^2*d^3)*log(c^2*x^2 +
 1)^2)/x^5
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^3}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^6,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^6, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2/x**6,x)
```

```
[Out] Timed out
```

3.94 $\int \frac{(d+icdx)^3\left(a+b\tan^{-1}(cx)\right)^2}{x^7}\,dx$

Optimal. Leaf size=513

$$\frac{28}{15}iabc^6d^3\log(x)+\frac{37}{20}ibc^6d^3\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)+\frac{1}{60}ibc^6d^3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{11bc^5d^3}{}$$

```
[Out] -1/60*b^2*c^2*d^3/x^4+1/3*I*c^3*d^3*(a+b*arctan(c*x))^2/x^3+61/180*b^2*c^4*
d^3/x^2-3/10*I*b*c^2*d^3*(a+b*arctan(c*x))/x^4+37/20*I*b*c^6*d^3*(a+b*arcta
n(c*x))*ln(2/(1-I*c*x))-1/15*b*c*d^3*(a+b*arctan(c*x))/x^5+14/15*I*b*c^4*d^
3*(a+b*arctan(c*x))/x^2+11/18*b*c^3*d^3*(a+b*arctan(c*x))/x^3-3/5*I*c*d^3*(
a+b*arctan(c*x))^2/x^5-11/6*b*c^5*d^3*(a+b*arctan(c*x))/x-1/6*d^3*(a+b*arct
an(c*x))^2/x^6+1/60*I*b*c^6*d^3*(a+b*arctan(c*x))*ln(2/(1+I*c*x))+3/4*c^2*d
^3*(a+b*arctan(c*x))^2/x^4+28/15*I*a*b*c^6*d^3*ln(x)-1/10*I*b^2*c^3*d^3/x^3
+113/45*b^2*c^6*d^3*ln(x)+37/30*I*b^2*c^5*d^3/x+37/30*I*b^2*c^6*d^3*arctan(
c*x)-113/90*b^2*c^6*d^3*ln(c^2*x^2+1)-14/15*b^2*c^6*d^3*polylog(2,-I*c*x)+1
4/15*b^2*c^6*d^3*polylog(2,I*c*x)+37/40*b^2*c^6*d^3*polylog(2,1-2/(1-I*c*x)
)-1/120*b^2*c^6*d^3*polylog(2,1-2/(1+I*c*x))
```

Rubi [A] time = 0.52, antiderivative size = 513, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {43, 4874, 4852, 266, 44, 325, 203, 36, 29, 31, 4848, 2391, 4854, 2402, 2315}

$$-\frac{14}{15}b^2c^6d^3\text{PolyLog}(2,-icx)+\frac{14}{15}b^2c^6d^3\text{PolyLog}(2,icx)+\frac{37}{40}b^2c^6d^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)-\frac{1}{120}b^2c^6d^3\text{PolyL}$$

Antiderivative was successfully verified.

```
[In] Int[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^7,x]
```

```
[Out] -(b^2*c^2*d^3)/(60*x^4) - ((I/10)*b^2*c^3*d^3)/x^3 + (61*b^2*c^4*d^3)/(180*
x^2) + (((37*I)/30)*b^2*c^5*d^3)/x + ((37*I)/30)*b^2*c^6*d^3*ArcTan[c*x] -
(b*c*d^3*(a + b*ArcTan[c*x]))/(15*x^5) - (((3*I)/10)*b*c^2*d^3*(a + b*ArcTa
n[c*x]))/x^4 + (11*b*c^3*d^3*(a + b*ArcTan[c*x]))/(18*x^3) + (((14*I)/15)*b
*c^4*d^3*(a + b*ArcTan[c*x]))/x^2 - (11*b*c^5*d^3*(a + b*ArcTan[c*x]))/(6*x
) - (d^3*(a + b*ArcTan[c*x])^2)/(6*x^6) - (((3*I)/5)*c*d^3*(a + b*ArcTan[c*
x])^2)/x^5 + (3*c^2*d^3*(a + b*ArcTan[c*x])^2)/(4*x^4) + ((I/3)*c^3*d^3*(a
+ b*ArcTan[c*x])^2)/x^3 + ((28*I)/15)*a*b*c^6*d^3*Log[x] + (113*b^2*c^6*d^3
*Log[x])/45 + ((37*I)/20)*b*c^6*d^3*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)]
+ (I/60)*b*c^6*d^3*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)] - (113*b^2*c^6*d^
3*Log[1 + c^2*x^2])/90 - (14*b^2*c^6*d^3*PolyLog[2, (-I)*c*x])/15 + (14*b^2
*c^6*d^3*PolyLog[2, I*c*x])/15 + (37*b^2*c^6*d^3*PolyLog[2, 1 - 2/(1 - I*c*
x)])/40 - (b^2*c^6*d^3*PolyLog[2, 1 - 2/(1 + I*c*x)])/120
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
```

```
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4874

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_.) + (e_
.)*(x_))^(q_), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dis
t[(a + b*ArcTan[c*x])^p, u, x] - Dist[b*c*p, Int[ExpandIntegrand[(a + b*Arc
Tan[c*x])^(p - 1), u/(1 + c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f,
 q}, x] && IGtQ[p, 1] && EqQ[c^2*d^2 + e^2, 0] && IntegersQ[m, q] && NeQ[m,
 -1] && NeQ[q, -1] && ILtQ[m + q + 1, 0] && LtQ[m*q, 0]
```

Rubi steps

$$\int \frac{(d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)^2}{x^7}\,dx = -\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{6x^6} - \frac{3icd^3\left(a+b\tan^{-1}(cx)\right)^2}{5x^5} + \frac{3c^2d^3\left(a+b\tan^{-1}\right.}{4x^4}$$

$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)^2}{6x^6} - \frac{3icd^3\left(a+b\tan^{-1}(cx)\right)^2}{5x^5} + \frac{3c^2d^3\left(a+b\tan^{-1}\right.}{4x^4}$$

$$= -\frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{15x^5} - \frac{3ibc^2d^3\left(a+b\tan^{-1}(cx)\right)}{10x^4} + \frac{11bc^3d^3\left(a+b\,\mathrm{ta}\right.}{18x^3}$$

$$= -\frac{ib^2c^3d^3}{10x^3} + \frac{14ib^2c^5d^3}{15x} - \frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{15x^5} - \frac{3ibc^2d^3\left(a+b\tan^{-1}(\right.}{10x^4}$$

$$= -\frac{ib^2c^3d^3}{10x^3} + \frac{37ib^2c^5d^3}{30x} + \frac{14}{15}ib^2c^6d^3\tan^{-1}(cx) - \frac{bcd^3\left(a+b\tan^{-1}(cx)\right)}{15x^5} -$$

$$= -\frac{b^2c^2d^3}{60x^4} - \frac{ib^2c^3d^3}{10x^3} + \frac{61b^2c^4d^3}{180x^2} + \frac{37ib^2c^5d^3}{30x} + \frac{37}{30}ib^2c^6d^3\tan^{-1}(cx) - \frac{bc}{}$$

Mathematica [A] time = 1.61, size = 401, normalized size = 0.78

$$d^3\left(60ia^2c^3x^3 + 135a^2c^2x^2 - 108ia^2cx - 30a^2 + 336iabc^6x^6\log(cx) - 330abc^5x^5 + 168iabc^4x^4 + 110abc^3x^3 - 5\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + I*c*d*x)^3*(a + b*ArcTan[c*x])^2)/x^7,x]
```

```
[Out] (d^3*(-30*a^2 - (108*I)*a^2*c*x - 12*a*b*c*x + 135*a^2*c^2*x^2 - (54*I)*a*b
*c^2*x^2 - 3*b^2*c^2*x^2 + (60*I)*a^2*c^3*x^3 + 110*a*b*c^3*x^3 - (18*I)*b^
2*c^3*x^3 + (168*I)*a*b*c^4*x^4 + 61*b^2*c^4*x^4 - 330*a*b*c^5*x^5 + (222*I
)*b^2*c^5*x^5 + 64*b^2*c^6*x^6 + 3*b^2*(-I + c*x)^4*(-10 + (4*I)*c*x + c^2*
x^2)*ArcTan[c*x]^2 + 2*b*ArcTan[c*x]*(b*c*x*(-6 - (27*I)*c*x + 55*c^2*x^2 +
```

```
(84*I)*c^3*x^3 - 165*c^4*x^4 + (111*I)*c^5*x^5) - 3*a*(10 + (36*I)*c*x - 4
5*c^2*x^2 - (20*I)*c^3*x^3 + 55*c^6*x^6) + (168*I)*b*c^6*x^6*Log[1 - E^((2*
I)*ArcTan[c*x])]) + (336*I)*a*b*c^6*x^6*Log[c*x] + 452*b^2*c^6*x^6*Log[(c*x
)/Sqrt[1 + c^2*x^2]] - (168*I)*a*b*c^6*x^6*Log[1 + c^2*x^2] + 168*b^2*c^6*x
^6*PolyLog[2, E^((2*I)*ArcTan[c*x])]))/(180*x^6)
```

fricas [F] time = 0.97, size = 0, normalized size = 0.00

$$240\,x^6\text{integral}\left(\frac{-60i\,a^2c^5d^3x^5-180\,a^2c^4d^3x^4+120i\,a^2c^3d^3x^3-120\,a^2c^2d^3x^2+180i\,a^2cd^3x+60\,a^2d^3+\left(60\,abc^5d^3x^5-20\left(9i\,ab-b^2\right)c^4d^3x^4-\left(120\,ab+45\right.\right.}{60\left(c^2x^9+x^7\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^7,x, algorithm="fricas")
```

```
[Out] 1/240*(240*x^6*integral(1/60*(-60*I*a^2*c^5*d^3*x^5 - 180*a^2*c^4*d^3*x^4 +
 120*I*a^2*c^3*d^3*x^3 - 120*a^2*c^2*d^3*x^2 + 180*I*a^2*c*d^3*x + 60*a^2*d
^3 + (60*a*b*c^5*d^3*x^5 - 20*(9*I*a*b - b^2)*c^4*d^3*x^4 - (120*a*b + 45*I
*b^2)*c^3*d^3*x^3 - 12*(10*I*a*b + 3*b^2)*c^2*d^3*x^2 - (180*a*b - 10*I*b^2
)*c*d^3*x + 60*I*a*b*d^3)*log(-(c*x + I)/(c*x - I)))/(c^2*x^9 + x^7), x) +
(-20*I*b^2*c^3*d^3*x^3 - 45*b^2*c^2*d^3*x^2 + 36*I*b^2*c*d^3*x + 10*b^2*d^3
)*log(-(c*x + I)/(c*x - I))^2)/x^6
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^7,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.12, size = 853, normalized size = 1.66

$$-\frac{d^3a^2}{6x^6}+\frac{14ic^4d^3ab}{15x^2}+\frac{28ic^6d^3ab\ln(cx)}{15}-\frac{14ic^6d^3ab\ln\left(c^2x^2+1\right)}{15}-\frac{14ic^6d^3b^2\arctan(cx)\ln\left(c^2x^2+1\right)}{15}+\frac{28ic^6d^3b^2\text{ar}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^7,x)
```

```
[Out] -1/6*d^3*a^2/x^6+1/3*I*c^3*d^3*a^2/x^3-3/5*I*c*d^3*a^2/x^5+3/4*c^2*d^3*b^2*
arctan(c*x)^2/x^4+11/18*c^3*d^3*b^2*arctan(c*x)/x^3-11/6*c^5*d^3*b^2*arctan
(c*x)/x-1/15*c*d^3*b^2*arctan(c*x)/x^5+7/15*c^6*d^3*b^2*ln(I+c*x)*ln(1/2*I*
(c*x-I))-1/15*c*d^3*a*b/x^5-1/3*d^3*a*b*arctan(c*x)/x^6-7/15*c^6*d^3*b^2*ln
(c*x-I)*ln(-1/2*I*(I+c*x))-14/15*c^6*d^3*b^2*ln(c*x)*ln(1+I*c*x)+14/15*c^6*
d^3*b^2*ln(c*x)*ln(1-I*c*x)-7/15*c^6*d^3*b^2*ln(I+c*x)*ln(c^2*x^2+1)-11/6*c
^5*d^3*a*b/x+11/18*c^3*d^3*a*b/x^3+7/15*c^6*d^3*b^2*ln(c*x-I)*ln(c^2*x^2+1)
-1/10*I*b^2*c^3*d^3/x^3+37/30*I*b^2*c^5*d^3/x+37/30*I*b^2*c^6*d^3*arctan(c*
x)-6/5*I*c*d^3*a*b*arctan(c*x)/x^5+2/3*I*c^3*d^3*a*b*arctan(c*x)/x^3-113/90
*b^2*c^6*d^3*ln(c^2*x^2+1)+7/30*c^6*d^3*b^2*ln(I+c*x)^2-7/30*c^6*d^3*b^2*ln
(c*x-I)^2+113/45*c^6*d^3*b^2*ln(c*x)-11/12*c^6*d^3*b^2*arctan(c*x)^2+3/4*c^
2*d^3*a^2/x^4-1/6*d^3*b^2*arctan(c*x)^2/x^6-14/15*c^6*d^3*b^2*dilog(1+I*c*x
)+14/15*c^6*d^3*b^2*dilog(1-I*c*x)-7/15*c^6*d^3*b^2*dilog(-1/2*I*(I+c*x))+7
/15*c^6*d^3*b^2*dilog(1/2*I*(c*x-I))-11/6*c^6*d^3*a*b*arctan(c*x)+3/2*c^2*d
^3*a*b*arctan(c*x)/x^4-3/10*I*c^2*d^3*a*b/x^4+14/15*I*c^4*d^3*b^2*arctan(c*
x)/x^2+1/3*I*c^3*d^3*b^2*arctan(c*x)^2/x^3-3/5*I*c*d^3*b^2*arctan(c*x)^2/x^
5-3/10*I*c^2*d^3*b^2*arctan(c*x)/x^4-14/15*I*c^6*d^3*b^2*arctan(c*x)*ln(c^2
*x^2+1)+28/15*I*c^6*d^3*b^2*arctan(c*x)*ln(c*x)+14/15*I*c^4*d^3*a*b/x^2+28/
```

```
15*I*c^6*d^3*a*b*ln(c*x)-14/15*I*c^6*d^3*a*b*ln(c^2*x^2+1)-1/60*b^2*c^2*d^3
/x^4+61/180*b^2*c^4*d^3/x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^2/x^7,x, algorithm="maxima")
```

```
[Out] -1/3*I*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3
)*a*b*c^3*d^3 - 1/2*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan
(c*x)/x^4)*a*b*c^2*d^3 - 3/10*I*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) -
 (2*c^2*x^2 - 1)/x^4)*c + 4*arctan(c*x)/x^5)*a*b*c*d^3 - 1/45*((15*c^5*arct
an(c*x) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arctan(c*x)/x^6)*a*b*d^3
 - 1/180*(4*(15*c^5*arctan(c*x) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c*arcta
n(c*x) - (30*c^4*x^4*arctan(c*x)^2 - 46*c^4*x^4*log(c^2*x^2 + 1) + 92*c^4*x
^4*log(x) + 16*c^2*x^2 - 3)*c^2/x^4)*b^2*d^3 + 1/3*I*a^2*c^3*d^3/x^3 + 3/4*
a^2*c^2*d^3/x^4 - 3/5*I*a^2*c*d^3/x^5 - 1/6*b^2*d^3*arctan(c*x)^2/x^6 - 1/6
*a^2*d^3/x^6 - 1/960*(960*I*x^5*integrate(1/240*(180*(b^2*c^5*d^3*x^4 - 2*b
^2*c^3*d^3*x^2 - 3*b^2*c*d^3)*arctan(c*x)^2 + 15*(b^2*c^5*d^3*x^4 - 2*b^2*c
^3*d^3*x^2 - 3*b^2*c*d^3)*log(c^2*x^2 + 1)^2 + 2*(65*b^2*c^4*d^3*x^3 - 36*b
^2*c^2*d^3*x)*arctan(c*x) - (20*b^2*c^5*d^3*x^4 - 81*b^2*c^3*d^3*x^2 + 180*
(b^2*c^4*d^3*x^3 + b^2*c^2*d^3*x)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^8 +
 x^6), x) + 960*x^5*integrate(1/240*(540*(b^2*c^4*d^3*x^3 + b^2*c^2*d^3*x)*
arctan(c*x)^2 + 45*(b^2*c^4*d^3*x^3 + b^2*c^2*d^3*x)*log(c^2*x^2 + 1)^2 - 2
*(20*b^2*c^5*d^3*x^4 - 81*b^2*c^3*d^3*x^2)*arctan(c*x) - (65*b^2*c^4*d^3*x^
3 - 36*b^2*c^2*d^3*x - 60*(b^2*c^5*d^3*x^4 - 2*b^2*c^3*d^3*x^2 - 3*b^2*c*d^
3)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^8 + x^6), x) + (-80*I*b^2*c^3*d^3*
x^2 - 180*b^2*c^2*d^3*x + 144*I*b^2*c*d^3)*arctan(c*x)^2 + (80*b^2*c^3*d^3*
x^2 - 180*I*b^2*c^2*d^3*x - 144*b^2*c*d^3)*arctan(c*x)*log(c^2*x^2 + 1) + (
20*I*b^2*c^3*d^3*x^2 + 45*b^2*c^2*d^3*x - 36*I*b^2*c*d^3)*log(c^2*x^2 + 1)^
2)/x^5
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2\,(d+c\,d\,x\,1\mathrm{i})^3}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^7,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + c*d*x*1i)^3)/x^7, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**2/x**7,x)
```

```
[Out] Timed out
```

3.95 $\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx$

Optimal. Leaf size=356

$$\frac{ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d}-\frac{5\left(a+b\tan^{-1}(cx)\right)^2}{6c^4d}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{c^4d}+\frac{8ib\log\left(\frac{2}{1+icx}\right)\left(a+b\tan\right.}{3c^4d}$$

```
[Out] -a*b*x/c^3/d-1/3*I*b^2*x/c^3/d+1/3*I*b^2*arctan(c*x)/c^4/d-b^2*x*arctan(c*x
)/c^3/d+1/3*I*b*x^2*(a+b*arctan(c*x))/c^2/d-5/6*(a+b*arctan(c*x))^2/c^4/d+I
*x*(a+b*arctan(c*x))^2/c^3/d+1/2*x^2*(a+b*arctan(c*x))^2/c^2/d-1/3*I*x^3*(a
+b*arctan(c*x))^2/c/d+8/3*I*b*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^4/d+(a+b*
arctan(c*x))^2*ln(2/(1+I*c*x))/c^4/d+1/2*b^2*ln(c^2*x^2+1)/c^4/d-4/3*b^2*po
lylog(2,1-2/(1+I*c*x))/c^4/d+I*b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))
/c^4/d+1/2*b^2*polylog(3,1-2/(1+I*c*x))/c^4/d
```

Rubi [A] time = 0.82, antiderivative size = 356, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.560, Rules used = {4866, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 4846, 260, 4884, 4994, 6610}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d}-\frac{4b^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^4d}+\frac{b^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2c^4d}+\frac{x^2\left(a+b\tan^{-1}\right.}{2c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x),x]
```

```
[Out] -((a*b*x)/(c^3*d)) - ((I/3)*b^2*x)/(c^3*d) + ((I/3)*b^2*ArcTan[c*x])/(c^4*d
) - (b^2*x*ArcTan[c*x])/(c^3*d) + ((I/3)*b*x^2*(a + b*ArcTan[c*x]))/(c^2*d)
 - (5*(a + b*ArcTan[c*x])^2)/(6*c^4*d) + (I*x*(a + b*ArcTan[c*x])^2)/(c^3*d
) + (x^2*(a + b*ArcTan[c*x])^2)/(2*c^2*d) - ((I/3)*x^3*(a + b*ArcTan[c*x])^
2)/(c*d) + (((8*I)/3)*b*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^4*d) + (
(a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c^4*d) + (b^2*Log[1 + c^2*x^2])/
(2*c^4*d) - (4*b^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(3*c^4*d) + (I*b*(a + b*A
rcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^4*d) + (b^2*PolyLog[3, 1 - 2/
(1 + I*c*x)])/(2*c^4*d)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx = \frac{i\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx}{c} - \frac{i\int x^2\left(a+b\tan^{-1}(cx)\right)^2 dx}{cd}$$

$$= -\frac{ix^3\left(a+b\tan^{-1}(cx)\right)^2}{3cd} - \frac{\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx}{c^2} + \frac{(2ib)\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}\,dx}{3d} + \frac{\int x\left(a\right.}{}$$

$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d} - \frac{ix^3\left(a+b\tan^{-1}(cx)\right)^2}{3cd} - \frac{i\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx}{c^3} + \frac{i\int\left(a+b\,\mathrm{ta}\right.}{c}$$

$$= \frac{ibx^2\left(a+b\tan^{-1}(cx)\right)}{3c^2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{3c^4d} + \frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d} + \frac{x^2\left(a+b\tan\right.}{2c^2d}$$

$$= -\frac{abx}{c^3d} - \frac{ib^2x}{3c^3d} + \frac{ibx^2\left(a+b\tan^{-1}(cx)\right)}{3c^2d} - \frac{5\left(a+b\tan^{-1}(cx)\right)^2}{6c^4d} + \frac{ix\left(a+b\tan^{-1}(cx)\right)}{c^3d}$$

$$= -\frac{abx}{c^3d} - \frac{ib^2x}{3c^3d} + \frac{ib^2\tan^{-1}(cx)}{3c^4d} - \frac{b^2x\tan^{-1}(cx)}{c^3d} + \frac{ibx^2\left(a+b\tan^{-1}(cx)\right)}{3c^2d} - \frac{5\left(a+b\,\mathrm{t}\right.}{6}$$

$$= -\frac{abx}{c^3d} - \frac{ib^2x}{3c^3d} + \frac{ib^2\tan^{-1}(cx)}{3c^4d} - \frac{b^2x\tan^{-1}(cx)}{c^3d} + \frac{ibx^2\left(a+b\tan^{-1}(cx)\right)}{3c^2d} - \frac{5\left(a+b\,\mathrm{t}\right.}{6}$$

$$= -\frac{abx}{c^3d} - \frac{ib^2x}{3c^3d} + \frac{ib^2\tan^{-1}(cx)}{3c^4d} - \frac{b^2x\tan^{-1}(cx)}{c^3d} + \frac{ibx^2\left(a+b\tan^{-1}(cx)\right)}{3c^2d} - \frac{5\left(a+b\,\mathrm{t}\right.}{6}$$

Mathematica [A] time = 1.04, size = 421, normalized size = 1.18

$$-\frac{ia^2\tan^{-1}(cx)}{c^4d} + \frac{ia^2x}{c^3d} + \frac{a^2x^2}{2c^2d} - \frac{a^2\log\left(c^2x^2+1\right)}{2c^4d} - \frac{ia^3x^3}{3cd} - \frac{iab\left(-8\log\left(\frac{1}{\sqrt{c^2x^2+1}}\right)+\left(c^2x^2+1\right)\left(2cx\tan^{-1}(cx)+3i\,\mathrm{tan}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x),x]
```

```
[Out] (I*a^2*x)/(c^3*d) + (a^2*x^2)/(2*c^2*d) - ((I/3)*a^2*x^3)/(c*d) - (I*a^2*Ar
cTan[c*x])/(c^4*d) - (a^2*Log[1 + c^2*x^2])/(2*c^4*d) - ((I/3)*a*b*((-3*I)*
c*x - 8*c*x*ArcTan[c*x] + 6*ArcTan[c*x]^2 + (1 + c^2*x^2)*(-1 + (3*I)*ArcTa
n[c*x] + 2*c*x*ArcTan[c*x]) + (6*I)*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x
])] - 8*Log[1/Sqrt[1 + c^2*x^2]] + 3*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/(
c^4*d) - ((I/6)*b^2*(2*c*x - (6*I)*c*x*ArcTan[c*x] - 2*(1 + c^2*x^2)*ArcTan
[c*x] + (8*I)*ArcTan[c*x]^2 - 8*c*x*ArcTan[c*x]^2 + (3*I)*(1 + c^2*x^2)*Arc
Tan[c*x]^2 + 2*c*x*(1 + c^2*x^2)*ArcTan[c*x]^2 + 4*ArcTan[c*x]^3 - 16*ArcTa
n[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + (6*I)*ArcTan[c*x]^2*Log[1 + E^((2*I
```

```
)*ArcTan[c*x])] - (6*I)*Log[1/Sqrt[1 + c^2*x^2]] + (8*I + 6*ArcTan[c*x])*Po
lyLog[2, -E^((2*I)*ArcTan[c*x])] + (3*I)*PolyLog[3, -E^((2*I)*ArcTan[c*x])]
))/(c^4*d)
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2x^3\log\left(-\frac{cx+i}{cx-i}\right)^2+4\,abx^3\log\left(-\frac{cx+i}{cx-i}\right)-4i\,a^2x^3}{4\,cdx-4i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*x^3*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*x^3*log(-(c*x + I)/
(c*x - I)) - 4*I*a^2*x^3)/(4*c*d*x - 4*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 7.94, size = 1331, normalized size = 3.74

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x),x)
```

```
[Out] 8/3*I/c^4*b^2/d*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+8/3*I/c^4*b
^2/d*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-I/c^4*b^2/d*arctan(c*x
)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+I/c^3*b^2/d*arctan(c*x)^2*x+1/c^2*a*b
/d*arctan(c*x)*x^2+I/c^4*b^2/d*Pi*arctan(c*x)^2+I/c^4*a*b/d*dilog(-1/2*I*(I
+c*x))-2/c^4*a*b/d*arctan(c*x)*ln(c*x-I)-1/3*I/c*b^2/d*arctan(c*x)^2*x^3+1/
3*I/c^2*b^2/d*arctan(c*x)*x^2+1/3*I/c^2*a*b/d*x^2-11/12*I/c^4*a*b/d*ln(c^2*
x^2+1)-1/2*I/c^4*a*b/d*ln(c*x-I)^2-5/24*I/c^4*a*b/d*ln(c^4*x^4+10*c^2*x^2+9
)-1/3*I*b^2*x/c^3/d-1/2*I/c^4*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((
1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I/c
^4*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1
)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-a*b*x/c^3/d-b^2*x*arctan(c*x
)/c^3/d+1/3/c^4*b^2/d-1/2*I/c^4*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)
)*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(
c^2*x^2+1)+1))*arctan(c*x)^2+I/c^4*a*b/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))+4/3*I
/c^4*b^2/d*arctan(c*x)-I/c^4*a^2/d*arctan(c*x)-1/3*I/c*a^2/d*x^3-5/12/c^4*a
*b/d*arctan(1/6*c^3*x^3+7/6*c*x)+5/12/c^4*a*b/d*arctan(1/2*c*x)-5/6/c^4*a*b
/d*arctan(1/2*c*x-1/2*I)+11/6/c^4*a*b/d*arctan(c*x)+1/c^4*b^2/d*arctan(c*x)
^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-1/c^4*b^2/d*arctan(c*x)^2*ln(c*x-I)+1/2/
c^2*b^2/d*arctan(c*x)^2*x^2+I/c^3*a^2/d*x-2/3*I/c^4*b^2/d*arctan(c*x)^3+1/2
/c^2*a^2/d*x^2+11/6/c^4*b^2/d*arctan(c*x)^2+1/2/c^4*b^2/d*polylog(3,-(1+I*c
*x)^2/(c^2*x^2+1))+8/3/c^4*b^2/d*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/c
^4*b^2/d*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+8/3/c^4*b^2/d*dilog(1+I*(1+I*c*x)/(c
^2*x^2+1)^(1/2))-1/2/c^4*a^2/d*ln(c^2*x^2+1)+4/3*I/c^4*a*b/d-1/2*I/c^4*b^2/
d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x
)^2-I/c^4*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)
)^2*arctan(c*x)^2-2/3*I/c*a*b/d*arctan(c*x)*x^3+2*I/c^3*a*b/d*arctan(c*x)*x
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3 (a + b \operatorname{atan}(c x))^2}{d + c d x 1\mathrm{i}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x))^2)/(d + c*d*x*1i),x)
[Out] int((x^3*(a + b*atan(c*x))^2)/(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))**2/(d+I*c*d*x),x)
[Out] Timed out
```

3.96 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx$

Optimal. Leaf size=277

$$\frac{b\mathrm{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d}+\frac{2b\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}-\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}$$

```
[Out] I*a*b*x/c^2/d+I*b^2*x*arctan(c*x)/c^2/d+1/2*I*(a+b*arctan(c*x))^2/c^3/d+x*(
a+b*arctan(c*x))^2/c^2/d-1/2*I*x^2*(a+b*arctan(c*x))^2/c/d+2*b*(a+b*arctan(
c*x))*ln(2/(1+I*c*x))/c^3/d-I*(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/c^3/d-1/2
*I*b^2*ln(c^2*x^2+1)/c^3/d+I*b^2*polylog(2,1-2/(1+I*c*x))/c^3/d+b*(a+b*arct
an(c*x))*polylog(2,1-2/(1+I*c*x))/c^3/d-1/2*I*b^2*polylog(3,1-2/(1+I*c*x))/
c^3/d
```

Rubi [A] time = 0.51, antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {4866, 4852, 4916, 4846, 260, 4884, 4920, 4854, 2402, 2315, 4994, 6610}

$$\frac{b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}+\frac{ib^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^3d}-\frac{ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2c^3d}+\frac{iabx}{c^2d}+\frac{x\left(a\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x),x]
```

```
[Out] (I*a*b*x)/(c^2*d) + (I*b^2*x*ArcTan[c*x])/(c^2*d) + ((I/2)*(a + b*ArcTan[c*
x])^2)/(c^3*d) + (x*(a + b*ArcTan[c*x])^2)/(c^2*d) - ((I/2)*x^2*(a + b*ArcT
an[c*x])^2)/(c*d) + (2*b*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^3*d) -
(I*(a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c^3*d) - ((I/2)*b^2*Log[1 + c
^2*x^2])/(c^3*d) + (I*b^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^3*d) + (b*(a +
b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^3*d) - ((I/2)*b^2*PolyLog[
3, 1 - 2/(1 + I*c*x)])/(c^3*d)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx = \frac{i\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}dx}{c} - \frac{i\int x\left(a+b\tan^{-1}(cx)\right)^2dx}{cd}$$

$$= -\frac{ix^2\left(a+b\tan^{-1}(cx)\right)^2}{2cd} - \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}dx}{c^2} + \frac{(ib)\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}dx}{d} + \frac{\int\left(a\right.}{}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix^2\left(a+b\tan^{-1}(cx)\right)^2}{2cd} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^3d}$$

$$= \frac{iabx}{c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix^2\left(a+b\tan^{-1}(cx)\right)^2}{2cd} - \frac{i\left(\right.}{}$$

$$= \frac{iabx}{c^2d} + \frac{ib^2x\tan^{-1}(cx)}{c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix^2\left(a+b\right.}{}$$

$$= \frac{iabx}{c^2d} + \frac{ib^2x\tan^{-1}(cx)}{c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix^2\left(a+b\right.}{}$$

$$= \frac{iabx}{c^2d} + \frac{ib^2x\tan^{-1}(cx)}{c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix^2\left(a+b\right.}{}$$

Mathematica [A] time = 0.60, size = 330, normalized size = 1.19

$$-\frac{i\left(3a^2c^2x^2 - 3a^2\log\left(c^2x^2+1\right) + 6ia^2cx - 6ia^2\tan^{-1}(cx) - 6iab\log\left(c^2x^2+1\right) + 6abc^2x^2\tan^{-1}(cx) + 6b\text{Li}_2\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x),x]
```

```
[Out] ((-1/6*I)*((6*I)*a^2*c*x - 6*a*b*c*x + 3*a^2*c^2*x^2 - (6*I)*a^2*ArcTan[c*x
] + 6*a*b*ArcTan[c*x] + (12*I)*a*b*c*x*ArcTan[c*x] - 6*b^2*c*x*ArcTan[c*x]
+ 6*a*b*c^2*x^2*ArcTan[c*x] - (12*I)*a*b*ArcTan[c*x]^2 + 9*b^2*ArcTan[c*x]^
2 + (6*I)*b^2*c*x*ArcTan[c*x]^2 + 3*b^2*c^2*x^2*ArcTan[c*x]^2 - (4*I)*b^2*A
rcTan[c*x]^3 + 12*a*b*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + (12*I)*b
^2*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 6*b^2*ArcTan[c*x]^2*Log[1 +
 E^((2*I)*ArcTan[c*x])] - 3*a^2*Log[1 + c^2*x^2] - (6*I)*a*b*Log[1 + c^2*x^
2] + 3*b^2*Log[1 + c^2*x^2] + 6*b*((-I)*a + b - I*b*ArcTan[c*x])*PolyLog[2,
 -E^((2*I)*ArcTan[c*x])] + 3*b^2*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/(c^3*
d)
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2x^2\log\left(-\frac{cx+i}{cx-i}\right)^2 + 4\,abx^2\log\left(-\frac{cx+i}{cx-i}\right) - 4i\,a^2x^2}{4\,cdx - 4i\,d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*x^2*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*x^2*log(-(c*x + I)/
(c*x - I)) - 4*I*a^2*x^2)/(4*c*d*x - 4*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 4.06, size = 1212, normalized size = 4.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x),x)
```

```
[Out] -2*I/c^3*b^2/d*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2*I/c^3*a^2/d*ln(c^
2*x^2+1)-1/2/c^3*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x
)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*
arctan(c*x)^2-1/2*I/c*a^2/d*x^2+1/c^2*b^2/d*arctan(c*x)^2*x+1/c^3*b^2/d*Pi*
arctan(c*x)^2+I/c^3*b^2/d*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/c^3*a*b/d*dilog(-
1/2*I*(I+c*x))-1/2/c^3*a*b/d*ln(c*x-I)^2-1/8/c^3*a*b/d*ln(c^4*x^4+10*c^2*x^
2+9)-3/4/c^3*a*b/d*ln(c^2*x^2+1)+2/c^3*b^2/d*arctan(c*x)*ln(1+I*(1+I*c*x)/(
c^2*x^2+1)^(1/2))+I*a*b*x/c^2/d+I*b^2*x*arctan(c*x)/c^2/d-2*I/c^3*b^2/d*dil
og(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+2/c^3*b^2/d*arctan(c*x)*ln(1-I*(1+I*c*x
)/(c^2*x^2+1)^(1/2))-1/c^3*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^
2+1))-3/2*I/c^3*b^2/d*arctan(c*x)^2-1/2*I/c^3*b^2/d*polylog(3,-(1+I*c*x)^2/
(c^2*x^2+1))-1/2/c^3*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^
2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2/c^3*b^2/d*Pi
*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x
)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-I/c*a*b/d*arctan(c*x)*x^2+2*I/c^3*a*b/d
*arctan(c*x)*ln(c*x-I)-1/2/c^3*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*
c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+I/c^3*b^2/d*arctan(c*x)^2*ln(c*x-I)+
1/c^3*a*b/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/c^3*b^2/d*Pi*csgn((1+I*c*x)^2/(c
^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+2/c^2*a*b/d*arctan(c
*x)*x-I/c^3*b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-1/2*I/c*b^2
/d*arctan(c*x)^2*x^2-1/4*I/c^3*a*b/d*arctan(1/2*c*x)+1/4*I/c^3*a*b/d*arctan
(1/6*c^3*x^3+7/6*c*x)+1/2*I/c^3*a*b/d*arctan(1/2*c*x-1/2*I)-3/2*I/c^3*a*b/d
*arctan(c*x)+1/c^3*a*b/d+1/c^2*a^2/d*x-1/c^3*a^2/d*arctan(c*x)+1/c^3*b^2/d*
arctan(c*x)-2/3/c^3*b^2/d*arctan(c*x)^3
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{d+c\,d\,x\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x))^2)/(d + c*d*x*1i),x)
```

```
[Out] int((x^2*(a + b*atan(c*x))^2)/(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))**2/(d+I*c*d*x),x)
```

```
[Out] Timed out
```

3.97 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx$

Optimal. Leaf size=192

$$-\frac{ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^2d}-\frac{2ib\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d}-\frac{\log\left(\frac{2}{1+icx}\right)\left(a+b\tan\right.}{c^2d}$$

```
[Out] (a+b*arctan(c*x))^2/c^2/d-I*x*(a+b*arctan(c*x))^2/c/d-2*I*b*(a+b*arctan(c*x
))*ln(2/(1+I*c*x))/c^2/d-(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/c^2/d+b^2*poly
log(2,1-2/(1+I*c*x))/c^2/d-I*b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/c
^2/d-1/2*b^2*polylog(3,1-2/(1+I*c*x))/c^2/d
```

Rubi [A] time = 0.29, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {4866, 4846, 4920, 4854, 2402, 2315, 4884, 4994, 6610}

$$-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d}+\frac{b^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^2d}-\frac{b^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2c^2d}+\frac{\left(a+b\tan^{-1}(c\right.}{c^2d}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x),x]
```

```
[Out] (a + b*ArcTan[c*x])^2/(c^2*d) - (I*x*(a + b*ArcTan[c*x])^2)/(c*d) - ((2*I)*
b*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^2*d) - ((a + b*ArcTan[c*x])^2*
Log[2/(1 + I*c*x)])/(c^2*d) + (b^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^2*d) -
 (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^2*d) - (b^2*Pol
yLog[3, 1 - 2/(1 + I*c*x)])/(2*c^2*d)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
```

```
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx = \frac{i\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx}{c} - \frac{i\int \left(a+b\tan^{-1}(cx)\right)^2\,dx}{cd}$$

$$= -\frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{cd} - \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^2d} + \frac{(2ib)\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}\,dx}{d}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{cd} - \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^2d} - ib\left(\right.$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{cd} - \frac{2ib\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d} - \left(\right.$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{cd} - \frac{2ib\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d} - \left(\right.$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{cd} - \frac{2ib\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{c^2d} - \left(\right.$$

Mathematica [A] time = 0.52, size = 239, normalized size = 1.24

$$-\frac{i\left(3ia^2\log\left(c^2x^2+1\right)+6a^2cx-6a^2\tan^{-1}(cx)-6ab\log\left(c^2x^2+1\right)-6b\text{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right)\left(a+b\tan^{-1}(cx)+i\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x),x]
```

```
[Out] ((-1/6*I)*(6*a^2*c*x - 6*a^2*ArcTan[c*x] + 12*a*b*c*x*ArcTan[c*x] - 12*a*b*
ArcTan[c*x]^2 - (6*I)*b^2*ArcTan[c*x]^2 + 6*b^2*c*x*ArcTan[c*x]^2 - 4*b^2*A
rcTan[c*x]^3 - (12*I)*a*b*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 12*b
^2*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - (6*I)*b^2*ArcTan[c*x]^2*Log
[1 + E^((2*I)*ArcTan[c*x])] + (3*I)*a^2*Log[1 + c^2*x^2] - 6*a*b*Log[1 + c^
2*x^2] - 6*b*(a + I*b + b*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])] -
 (3*I)*b^2*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/(c^2*d)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2x\log\left(-\frac{cx+i}{cx-i}\right)^2 + 4\,abx\log\left(-\frac{cx+i}{cx-i}\right) - 4i\,a^2x}{4\,cdx - 4i\,d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*x*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*x*log(-(c*x + I)/(c*x
 - I)) - 4*I*a^2*x)/(4*c*d*x - 4*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.91, size = 4589, normalized size = 23.90

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))^2/(d+I*c*d*x),x)
```

```
[Out] -1/c^2*b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+1/c^2*b^2/d*ln(c
*x-I)*arctan(c*x)^2-1/2/c^2*a*b/d*arctan(1/4*c*x)+1/c^2*a*b/d*arctan(1/2*c*
x-1/2*I)-1/2/c^2*a*b/d*arctan(1/12*c^3*x^3+13/12*c*x)+I/c^2*a^2/d*arctan(c*
x)-I/c*a^2/d*x+2/3*I/c^2*b^2/d*arctan(c*x)^3-1/c^2*b^2/d*dilog(1-I*(1+I*c*x
)/(c^2*x^2+1)^(1/2))-1/2/c^2*b^2/d*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))-1/c^
2*b^2/d*arctan(c*x)^2-1/2/c^2*b^2/d*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-1/c
^2*b^2/d*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2/c^2*a^2/d*ln(c^2*x^2+1)
+1/2/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2
*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c
*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^
2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1
)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/
2))+1/2*I/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2
/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arc
tan(c*x)^2-1/2*I/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I
*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+
1))*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/4*I/c^2*b^2/d*Pi*csgn(I/((1+I*
c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*
x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-1/2
*I/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x
^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*dilog(1+I*
```

```
(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+
1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x
)^2/(c^2*x^2+1)+1))*arctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/2/c^2*b^2/d
*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)
*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+I/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x
^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2/c^2*b^2/d*Pi*csgn((1
+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)*ln((1+I*c*
x)^2/(c^2*x^2+1)+1)+1/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^
2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I/c*a
*b/d*arctan(c*x)*x-I/c^2*a*b/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/2*I/c^2*b^2/d
*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*dilog(1-I*(
1+I*c*x)/(c^2*x^2+1)^(1/2))-I/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/4*I/c^
2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*poly
log(2,-(1+I*c*x)^2/(c^2*x^2+1))+1/2*I/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^
2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+1/2*I/c^2*b^2/d*Pi*csgn((
1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*polylog(2,-(1+I*c*x)^
2/(c^2*x^2+1))-1/2*I/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))^3*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-I/c^2*b^2/d*Pi*cs
gn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*dilog(1+I*(1+I*c*
x)/(c^2*x^2+1)^(1/2))-1/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x
)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/2/c^2*b^2
/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*
x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2
*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^
2+1)^(1/2))+I/c^2*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+2/c
^2*a*b/d*ln(c*x-I)*arctan(c*x)-I/c^2*b^2/d*arctan(c*x)^2*Pi-I/c^2*b^2/d*arc
tan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-I/c^2*b^2/d*arctan(c*x)*ln((1+
I*c*x)^2/(c^2*x^2+1)+1)-I/c^2*b^2/d*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1
)^(1/2))-I/c*b^2/d*arctan(c*x)^2*x-1/2*I/c^2*b^2/d*Pi*polylog(2,-(1+I*c*x)^
2/(c^2*x^2+1))-I/c^2*a*b/d*dilog(-1/2*I*(I+c*x))+1/2*I/c^2*a*b/d*ln(c*x-I)^
2+1/4*I/c^2*a*b/d*ln(c^8*x^8+12*c^6*x^6+30*c^4*x^4+28*c^2*x^2+9)-1/c^2*b^2/
d*Pi*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+I/c^2*b^2/d*Pi*dilog(1
-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+I/c^2*b^2/d*Pi*dilog(1+I*(1+I*c*x)/(c^2*x^2
+1)^(1/2))+1/c^2*b^2/d*Pi*arctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/c^2*b
^2/d*Pi*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2*I/c^2*b^2/d*Pi*
csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*I/c^2*b^2/d
*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*
c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/
(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*di
log(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/4*I/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c
^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*poly
log(2,-(1+I*c*x)^2/(c^2*x^2+1))+1/2/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+
1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)
*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(
c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*
arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2/c^2*b^2/d*Pi*csgn((1+I*
c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1
))^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2/c^2*b^2/d*Pi*csgn(
I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c
^2*x^2+1)+1))^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2/c^2*b^2
/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/2/c^2*b^2/
d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I
*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/2*I/c
^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1
)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/4
*I/c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x
```

```
^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+1/
2*I/c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)
/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I/c^2*b^2/d*Pi*csgn((1+I*
c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1
))^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(c\,x))^2}{d+c\,d\,x\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x))^2)/(d + c*d*x*1i),x)
```

```
[Out] int((x*(a + b*atan(c*x))^2)/(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))**2/(d+I*c*d*x),x)
```

```
[Out] Timed out
```

3.98 $\int \frac{(a+b\tan^{-1}(cx))^2}{d+icdx}\,dx$

Optimal. Leaf size=98

$$-\frac{b\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{cd}+\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{cd}+\frac{ib^2\text{Li}_3\left(1-\frac{2}{icx+1}\right)}{2cd}$$

```
[Out] I*(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/c/d-b*(a+b*arctan(c*x))*polylog(2,1-2
/(1+I*c*x))/c/d+1/2*I*b^2*polylog(3,1-2/(1+I*c*x))/c/d
```

Rubi [A] time = 0.13, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4854, 4884, 4994, 6610}

$$-\frac{b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{cd}+\frac{ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2cd}+\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(d + I*c*d*x),x]
```

```
[Out] (I*(a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c*d) - (b*(a + b*ArcTan[c*x])
*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c*d) + ((I/2)*b^2*PolyLog[3, 1 - 2/(1 + I*
c*x)])/(c*d)
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+icdx}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{(2ib)\int\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{1+c^2x^2}dx}{d}$$
$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{b\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2}{1+icx}\right)}{cd} + \frac{b^2\int\frac{\text{Li}_2\left(1-\frac{2}{1+icx}\right)}{1+c^2x^2}}{d}$$
$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{b\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2}{1+icx}\right)}{cd} + \frac{ib^2\text{Li}_3\left(1-\frac{2}{1+ic}\right.}{2cd}$$

Mathematica [A] time = 0.04, size = 95, normalized size = 0.97

$$\frac{i\left(2\log\left(\frac{2d}{d+icdx}\right)\left(a+b\tan^{-1}(cx)\right)^2+2ib\text{Li}_2\left(\frac{cx+i}{cx-i}\right)\left(a+b\tan^{-1}(cx)\right)+b^2\text{Li}_3\left(\frac{cx+i}{cx-i}\right)\right)}{2cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(d + I*c*d*x),x]
```

```
[Out] ((I/2)*(2*(a + b*ArcTan[c*x])^2*Log[(2*d)/(d + I*c*d*x)] + (2*I)*b*(a + b*A
rcTan[c*x])*PolyLog[2, (I + c*x)/(-I + c*x)] + b^2*PolyLog[3, (I + c*x)/(-I
 + c*x)]))/(c*d)
```

fricas [F] time = 0.86, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2\log\left(-\frac{cx+i}{cx-i}\right)^2+4\,ab\log\left(-\frac{cx+i}{cx-i}\right)-4i\,a^2}{4\,cdx-4i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*log(-(c*x + I)/(c*x - I
)) - 4*I*a^2)/(4*c*d*x - 4*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.55, size = 1062, normalized size = 10.84

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/(d+I*c*d*x),x)
```

```
[Out] I/c*b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+1/c*a^2/d*arctan(c*
x)-2*I/c*a*b/d*ln(1+I*c*x)*arctan(c*x)-I/c*b^2/d*ln(1+I*c*x)*arctan(c*x)^2-
1/2/c*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*
arctan(c*x)^2-1/2/c*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*
```

```
c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2/c*b^2/d
*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2/c*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^
2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c
*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+1/2/c*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^
2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2/c*b^2/d*Pi*csgn(I*(1+I*c*x)^2/(c^2*x
^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-1/2/c*b^2/d*Pi*csgn((1+I
*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(1+I*c*x)^2/(c^2*x^
2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/2/c*b^2/d*Pi*csgn(I*(1+I*
c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2/c*b^2/d
*Pi*arctan(c*x)^2+1/c*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))
-1/2*I/c*a^2/d*ln(c^2*x^2+1)+2/3/c*b^2/d*arctan(c*x)^3+1/2*I/c*b^2/d*polylo
g(3,-(1+I*c*x)^2/(c^2*x^2+1))+1/c*a*b/d*ln(1/2-1/2*I*c*x)*ln(1/2*I*c*x+1/2)
-1/c*a*b/d*ln(1/2-1/2*I*c*x)*ln(1+I*c*x)+1/c*a*b/d*dilog(1/2*I*c*x+1/2)+1/2
/c*a*b/d*ln(1+I*c*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\,a^2\log\left(i\,cdx+d\right)}{cd}+\frac{24\,b^2\arctan\left(cx\right)^3+6\,b^2\arctan\left(cx\right)\log\left(c^2x^2+1\right)^2-2\left(12\,b^2c\int\frac{x\arctan(cx)\log\left(c^2x^2+1\right)}{c^2dx^2+d}\,dx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -I*a^2*log(I*c*d*x + d)/(c*d) + 1/96*(24*b^2*arctan(c*x)^3 + 12*I*b^2*arcta
n(c*x)^2*log(c^2*x^2 + 1) + 6*b^2*arctan(c*x)*log(c^2*x^2 + 1)^2 + 3*I*b^2*
log(c^2*x^2 + 1)^3 - 8*(48*b^2*c*integrate(1/16*x*arctan(c*x)*log(c^2*x^2 +
 1)/(c^2*d*x^2 + d), x) - b^2*arctan(c*x)^3/(c*d) + 12*b^2*integrate(1/16*l
og(c^2*x^2 + 1)^2/(c^2*d*x^2 + d), x) - 12*a*b*arctan(c*x)^2/(c*d))*c*d - 9
6*I*c*d*integrate(1/16*(20*b^2*c*x*arctan(c*x)^2 + 3*b^2*c*x*log(c^2*x^2 +
1)^2 + 32*a*b*c*x*arctan(c*x) + 4*b^2*arctan(c*x)*log(c^2*x^2 + 1))/(c^2*d*
x^2 + d), x))/(c*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{d+c\,d\,x\,1{}\mathrm{i}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(d + c*d*x*1i),x)
```

```
[Out] int((a + b*atan(c*x))^2/(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/(d+I*c*d*x),x)
```

```
[Out] Timed out
```

3.99 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)}\,dx$

Optimal. Leaf size=88

$$\frac{ib\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{d}+\frac{b^2\text{Li}_3\left(\frac{2}{icx+1}-1\right)}{2d}$$

```
[Out] (a+b*arctan(c*x))^2*ln(2-2/(1+I*c*x))/d+I*b*(a+b*arctan(c*x))*polylog(2,-1+
2/(1+I*c*x))/d+1/2*b^2*polylog(3,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 0.16, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.160, Rules used = {4868, 4884, 4994, 6610}

$$\frac{ib\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{b^2\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d}+\frac{\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x*(d + I*c*d*x)),x]
```

```
[Out] ((a + b*ArcTan[c*x])^2*Log[2 - 2/(1 + I*c*x)])/d + (I*b*(a + b*ArcTan[c*x])
*PolyLog[2, -1 + 2/(1 + I*c*x)])/d + (b^2*PolyLog[3, -1 + 2/(1 + I*c*x)])/(
2*d)
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)}\,dx = \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1+icx}\right)}{d} - \frac{(2bc)\int \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1+icx}\right)}{1+c^2x^2}dx}{d}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1+icx}\right)}{d} + \frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(-1+\frac{2}{1+icx}\right)}{d} - \frac{\left(ib^2c\right)\ldots}{}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1+icx}\right)}{d} + \frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(-1+\frac{2}{1+icx}\right)}{d} + \frac{b^2\mathrm{Li}_3\left(\ldots\right.}{}$$

Mathematica [**A**] time = 0.12, size = 113, normalized size = 1.28

$$\frac{2ib\mathrm{Li}_2\left(\frac{cx+i}{i-cx}\right)\left(a+b\tan^{-1}(cx)\right)+2\left(\log\left(\frac{2i}{-cx+i}\right)+2\tanh^{-1}\left(\frac{cx+i}{cx-i}\right)\right)\left(a+b\tan^{-1}(cx)\right)^2+b^2\mathrm{Li}_3\left(\frac{cx+i}{i-cx}\right)}{2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x*(d + I*c*d*x)),x]
```

```
[Out] (2*(a + b*ArcTan[c*x])^2*(2*ArcTanh[(I + c*x)/(-I + c*x)] + Log[(2*I)/(I -
c*x)]) + (2*I)*b*(a + b*ArcTan[c*x])*PolyLog[2, (I + c*x)/(I - c*x)] + b^2*
PolyLog[3, (I + c*x)/(I - c*x)])/(2*d)
```

fricas [**F**] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2\log\left(-\frac{cx+i}{cx-i}\right)^2+4\,ab\log\left(-\frac{cx+i}{cx-i}\right)-4i\,a^2}{4\,cdx^2-4i\,dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*log(-(c*x + I)/(c*x - I
)) - 4*I*a^2)/(4*c*d*x^2 - 4*I*d*x), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**C**] time = 0.50, size = 1741, normalized size = 19.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x/(d+I*c*d*x),x)
```

```
[Out] a^2/d*ln(c*x)+2*b^2/d*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*b^2/d*polylo
g(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*I*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+
1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)
^2-1/2*I*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(
```

```
c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*b^2/d*Pi*c
sgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I
*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I
/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))^2-b^2/d*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)-2/3*I*b^2/
d*arctan(c*x)^3-I*a^2/d*arctan(c*x)+b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/
(c^2*x^2+1))-b^2/d*ln(c*x-I)*arctan(c*x)^2-2*I*b^2/d*arctan(c*x)*polylog(2,
-(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*b^2/d*arctan(c*x)*polylog(2,(1+I*c*x)/(c^
2*x^2+1)^(1/2))+3/2*I*b^2/d*Pi*arctan(c*x)^2-2*a*b/d*ln(c*x-I)*arctan(c*x)+
2*a*b/d*arctan(c*x)*ln(c*x)+I*a*b/d*dilog(1+I*c*x)+I*a*b/d*dilog(-1/2*I*(I+
c*x))-I*a*b/d*dilog(1-I*c*x)-1/2*I*a*b/d*ln(c*x-I)^2-1/2*I*b^2/d*Pi*csgn(((
1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-I*a*
b/d*ln(c*x)*ln(1-I*c*x)+I*a*b/d*ln(c*x)*ln(1+I*c*x)-1/2*I*b^2/d*Pi*arctan(c
*x)^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3-I*b^2/d*P
i*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2
+1/2*I*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))^3*arctan(c*x)^2+1/2*I*b^2/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*
c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+I*a*b/d*ln(-1/2*I*(I+c*x))*ln(c*x-I)
-1/2*I*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan
(c*x)^2+1/2*I*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2
*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*a
rctan(c*x)^2+b^2/d*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2/d*ar
ctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2/d*arctan(c*x)^2*ln(c*x)-1
/2*a^2/d*ln(c^2*x^2+1)+1/2*I*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*c
sgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I
*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/2*I*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c
^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((
1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\frac{\log(icx+1)}{d}-\frac{\log(x)}{d}\right)+\frac{-24i\,b^2\arctan(cx)^3+12\,b^2\arctan(cx)^2\log\left(c^2x^2+1\right)-6i\,b^2\arctan(cx)\log\left(c^2x^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -a^2*(log(I*c*x + 1)/d - log(x)/d) + 1/96*(-24*I*b^2*arctan(c*x)^3 + 12*b^2
*arctan(c*x)^2*log(c^2*x^2 + 1) - 6*I*b^2*arctan(c*x)*log(c^2*x^2 + 1)^2 +
3*b^2*log(c^2*x^2 + 1)^3 - 2*(384*b^2*c^2*integrate(1/16*x^2*arctan(c*x)^2/
(c^2*d*x^3 + d*x), x) + 192*b^2*c*integrate(1/16*x*arctan(c*x)*log(c^2*x^2
+ 1)/(c^2*d*x^3 + d*x), x) + b^2*log(c^2*x^2 + 1)^3/d - 576*b^2*integrate(1
/16*arctan(c*x)^2/(c^2*d*x^3 + d*x), x) - 48*b^2*integrate(1/16*log(c^2*x^2
 + 1)^2/(c^2*d*x^3 + d*x), x) - 1536*a*b*integrate(1/16*arctan(c*x)/(c^2*d*
x^3 + d*x), x))*d - 8*I*(b^2*arctan(c*x)^3/d - 12*b^2*c*integrate(1/16*x*lo
g(c^2*x^2 + 1)^2/(c^2*d*x^3 + d*x), x) + 12*a*b*arctan(c*x)^2/d + 48*b^2*in
tegrate(1/16*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*d*x^3 + d*x), x))*d)/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))^2}{x\,(d+c\,d\,x\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a^2}{cx^2-ix}\,dx+\int \frac{b^2\,\mathrm{atan}^2\,(cx)}{cx^2-ix}\,dx+\int \frac{2ab\,\mathrm{atan}\,(cx)}{cx^2-ix}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a**2/(c*x**2 - I*x), x) + Integral(b**2*atan(c*x)**2/(c*x**2 -
 I*x), x) + Integral(2*a*b*atan(c*x)/(c*x**2 - I*x), x))/d
```

3.100 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+icdx)}\,dx$

Optimal. Leaf size=186

$$\frac{bc\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx}+\frac{2bc\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx\right.}{d}$$

```
[Out] -I*c*(a+b*arctan(c*x))^2/d-(a+b*arctan(c*x))^2/d/x+2*b*c*(a+b*arctan(c*x))*
ln(2-2/(1-I*c*x))/d-I*c*(a+b*arctan(c*x))^2*ln(2-2/(1+I*c*x))/d-I*b^2*c*pol
ylog(2,-1+2/(1-I*c*x))/d+b*c*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d-
1/2*I*b^2*c*polylog(3,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 0.40, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.320, Rules used = {4870, 4852, 4924, 4868, 2447, 4884, 4994, 6610}

$$\frac{bc\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{ib^2c\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)}{d}-\frac{ib^2c\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d}-\frac{ic\left(a+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^2*(d + I*c*d*x)),x]
```

```
[Out] ((-I)*c*(a + b*ArcTan[c*x])^2)/d - (a + b*ArcTan[c*x])^2/(d*x) + (2*b*c*(a
+ b*ArcTan[c*x])*Log[2 - 2/(1 - I*c*x)])/d - (I*c*(a + b*ArcTan[c*x])^2*Log
[2 - 2/(1 + I*c*x)])/d - (I*b^2*c*PolyLog[2, -1 + 2/(1 - I*c*x)])/d + (b*c*
(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d - ((I/2)*b^2*c*PolyLo
g[3, -1 + 2/(1 + I*c*x)])/d
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
```

```
LtQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+icdx)}\,dx = -\left((ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)}\,dx\right)+\frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx}-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{(2bc)\int \frac{a+b\tan^{-1}(cx)}{x\left(1+c^2x^2\right)}\,dx}{d}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx}-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1+icx}\right)}{d}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx}+\frac{2bc\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1-icx}\right)}{d}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx}+\frac{2bc\left(a+b\tan^{-1}(cx)\right)\log\left(2-\frac{2}{1-icx}\right)}{d}$$

Mathematica [A] time = 0.92, size = 265, normalized size = 1.42

$$-\frac{-ia^2c\log\left(c^2x^2+1\right)+2ia^2c\log(x)+2a^2c\tan^{-1}(cx)+\frac{2a^2}{x}+2abc\left(2\left(-\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)+\tan^{-1}(cx)^2+\tan^{-1}(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^2*(d + I*c*d*x)),x]
```

```
[Out] -1/2*((2*a^2)/x + 2*a^2*c*ArcTan[c*x] + (2*I)*a^2*c*Log[x] - I*a^2*c*Log[1
+ c^2*x^2] + 2*a*b*c*(2*(ArcTan[c*x]^2 + ArcTan[c*x]*(1/(c*x) + I*Log[1 - E
^((2*I)*ArcTan[c*x])]) - Log[(c*x)/Sqrt[1 + c^2*x^2]]) + PolyLog[2, E^((2*I
)*ArcTan[c*x])]) + (2*I)*b^2*c*((-1/24*I)*Pi^3 + ArcTan[c*x]^2 - (I*ArcTan[
c*x]^2)/(c*x) + ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] + (2*I)*ArcTa
n[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + I*ArcTan[c*x]*PolyLog[2, E^((-2*I)*
ArcTan[c*x])] + PolyLog[2, E^((2*I)*ArcTan[c*x])] + PolyLog[3, E^((-2*I)*Ar
cTan[c*x])]/2))/d
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2\log\left(-\frac{cx+i}{cx-i}\right)^2+4\,ab\log\left(-\frac{cx+i}{cx-i}\right)-4i\,a^2}{4\,cdx^3-4i\,dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*log(-(c*x + I)/(c*x - I
)) - 4*I*a^2)/(4*c*d*x^3 - 4*I*d*x^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 1.29, size = 9235, normalized size = 49.65

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x),x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2}{x^2\,\left(d+c\,d\,x\,1\mathrm{i}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^2*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^2*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a^2}{cx^3-ix^2}\,dx+\int \frac{b^2\operatorname{atan}^2(cx)}{cx^3-ix^2}\,dx+\int \frac{2ab\operatorname{atan}(cx)}{cx^3-ix^2}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**2/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a**2/(c*x**3 - I*x**2), x) + Integral(b**2*atan(c*x)**2/(c*x**
3 - I*x**2), x) + Integral(2*a*b*atan(c*x)/(c*x**3 - I*x**2), x))/d
```

3.101 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3(d+icdx)}\,dx$

Optimal. Leaf size=273

$$-\frac{ibc^2\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{3c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d}-\frac{2ibc^2\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{c^2\log\left(2-\right.}{}$$

```
[Out] -b*c*(a+b*arctan(c*x))/d/x-3/2*c^2*(a+b*arctan(c*x))^2/d-1/2*(a+b*arctan(c*
x))^2/d/x^2+I*c*(a+b*arctan(c*x))^2/d/x+b^2*c^2*ln(x)/d-1/2*b^2*c^2*ln(c^2*
x^2+1)/d-2*I*b*c^2*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))/d-c^2*(a+b*arctan(c*
x))^2*ln(2-2/(1+I*c*x))/d-b^2*c^2*polylog(2,-1+2/(1-I*c*x))/d-I*b*c^2*(a+b*
arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d-1/2*b^2*c^2*polylog(3,-1+2/(1+I*c*
x))/d
```

Rubi [A] time = 0.62, antiderivative size = 273, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 13, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.520, Rules used = {4870, 4852, 4918, 266, 36, 29, 31, 4884, 4924, 4868, 2447, 4994, 6610}

$$-\frac{ibc^2\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{b^2c^2\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)}{d}-\frac{b^2c^2\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d}-\frac{3c^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^3*(d + I*c*d*x)),x]
```

```
[Out] -((b*c*(a + b*ArcTan[c*x]))/(d*x)) - (3*c^2*(a + b*ArcTan[c*x])^2)/(2*d) -
(a + b*ArcTan[c*x])^2/(2*d*x^2) + (I*c*(a + b*ArcTan[c*x])^2)/(d*x) + (b^2*
c^2*Log[x])/d - (b^2*c^2*Log[1 + c^2*x^2])/(2*d) - ((2*I)*b*c^2*(a + b*ArcT
an[c*x])*Log[2 - 2/(1 - I*c*x)])/d - (c^2*(a + b*ArcTan[c*x])^2*Log[2 - 2/(
1 + I*c*x)])/d - (b^2*c^2*PolyLog[2, -1 + 2/(1 - I*c*x)])/d - (I*b*c^2*(a +
 b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d - (b^2*c^2*PolyLog[3, -1
+ 2/(1 + I*c*x)])/(2*d)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
```

```
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
 LtQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3(d+icdx)}\,dx = -\left((ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+icdx)}\,dx\right) + \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} - c^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)}\,dx - \frac{(ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx}{d} + \frac{(bc)\int \frac{a}{}}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1+icx}\right)}{d} +$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{ic\left(a+b\tan^{-1}\right.}{dx}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{ic\left(a+b\tan^{-1}\right.}{dx}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{ic\left(a+b\tan^{-1}\right.}{dx}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{ic\left(a+b\tan^{-1}\right.}{dx}$$

Mathematica [A] time = 1.21, size = 372, normalized size = 1.36

$$a^2c^2\log\left(c^2x^2+1\right) - 2a^2c^2\log(x) + 2ia^2c^2\tan^{-1}(cx) + \frac{2ia^2c}{x} - \frac{a^2}{x^2} + \frac{2iab\left(c^2x^2\text{Li}_2\left(e^{2i\tan^{-1}(cx)}\right)+cx\left(-2cx\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)+i\right)+2c^2x\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^3*(d + I*c*d*x)),x]
```

```
[Out] (-(a^2/x^2) + ((2*I)*a^2*c)/x + (2*I)*a^2*c^2*ArcTan[c*x] - 2*a^2*c^2*Log[x
] + a^2*c^2*Log[1 + c^2*x^2] + ((2*I)*a*b*(2*c^2*x^2*ArcTan[c*x]^2 + ArcTan
[c*x]*(I + 2*c*x + I*c^2*x^2 + (2*I)*c^2*x^2*Log[1 - E^((2*I)*ArcTan[c*x])]
) + c*x*(I - 2*c*x*Log[(c*x)/Sqrt[1 + c^2*x^2]]) + c^2*x^2*PolyLog[2, E^((2
*I)*ArcTan[c*x])]))/x^2 + 2*b^2*c^2*((I/24)*Pi^3 - ArcTan[c*x]/(c*x) - (3*A
rcTan[c*x]^2)/2 - ArcTan[c*x]^2/(2*c^2*x^2) + (I*ArcTan[c*x]^2)/(c*x) - Arc
Tan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - (2*I)*ArcTan[c*x]*Log[1 - E^((
2*I)*ArcTan[c*x])] + Log[(c*x)/Sqrt[1 + c^2*x^2]] - I*ArcTan[c*x]*PolyLog[2
, E^((-2*I)*ArcTan[c*x])] - PolyLog[2, E^((2*I)*ArcTan[c*x])] - PolyLog[3,
E^((-2*I)*ArcTan[c*x])]/2))/(2*d)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2\log\left(-\frac{cx+i}{cx-i}\right)^2 + 4\,ab\log\left(-\frac{cx+i}{cx-i}\right) - 4i\,a^2}{4\,cdx^4 - 4i\,dx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*log(-(c*x + I)/(c*x - I
)) - 4*I*a^2)/(4*c*d*x^4 - 4*I*d*x^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 7.15, size = 2221, normalized size = 8.14

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x),x)
```

```
[Out] 2*c^2*a*b/d*ln(c*x-I)*arctan(c*x)-2*c^2*a*b/d*arctan(c*x)*ln(c*x)+I*c*b^2/d
*arctan(c*x)^2/x+I*c^2*a*b/d*ln(c^2*x^2+1)+I*c^2*a*b/d*dilog(1-I*c*x)+1/2*I
*c^2*a*b/d*ln(c*x-I)^2-2*I*c^2*a*b/d*ln(c*x)-I*c^2*a*b/d*dilog(1+I*c*x)-2*I
*c^2*b^2/d*arctan(c*x)*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I*c^2*b^2/d*arct
an(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I*c^2*b^2/d*arctan(c*x)*po
lylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-3/2*I*c^2*b^2/d*arctan(c*x)^2*Pi-I*c^
2*a*b/d*dilog(-1/2*I*(I+c*x))-1/2*a^2/d/x^2-1/2*b^2/d*arctan(c*x)^2/x^2-c^2
*a^2/d*ln(c*x)-2*c^2*b^2/d*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*c^2*b^2
/d*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*c^2*b^2/d*dilog(1+(1+I*c*x)/(c
^2*x^2+1)^(1/2))+2*c^2*b^2/d*dilog((1+I*c*x)/(c^2*x^2+1)^(1/2))+c^2*b^2/d*l
n(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+c^2*b^2/d*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1
)-3/2*c^2*b^2/d*arctan(c*x)^2+1/2*c^2*a^2/d*ln(c^2*x^2+1)-a*b/d*arctan(c*x)
/x^2-c*b^2/d*arctan(c*x)/x+I*c^2*a^2/d*arctan(c*x)-c^2*a*b/d*arctan(c*x)-c^
2*b^2/d*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-c^2*b^2/d*arctan(c*
x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-c^2*b^2/d*arctan(c*x)^2*ln(c*x)+c^2*
b^2/d*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)-c^2*b^2/d*arctan(c*x)^2*l
n(2*I*(1+I*c*x)^2/(c^2*x^2+1))+c^2*b^2/d*ln(c*x-I)*arctan(c*x)^2+I*c*a^2/d/
x-I*c^2*b^2/d*arctan(c*x)+2/3*I*c^2*b^2/d*arctan(c*x)^3+1/2*I*c^2*b^2/d*Pi*
csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+
I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*c^2*b^2/d*Pi*csgn(I*((1+I*c*
x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2
+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*c^2*b^2/d*Pi*csgn
(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*
x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2
/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^
2*arctan(c*x)^2+1/2*I*c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*
c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*c^2*b
^2/d*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*
x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))-1/
2*I*c^2*b^2/d*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/(
(1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))+1/2*I*c^2*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csg
n((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x
^2+1)+1))*arctan(c*x)^2-I*c^2*a*b/d*ln(c*x)*ln(1+I*c*x)-I*c^2*a*b/d*ln(c*x-
I)*ln(-1/2*I*(I+c*x))-1/2*I*c^2*b^2/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/(
(1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-1/2*I*c^2*b^2/d*arctan(c*x)^2*P
i*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3+1/2*I*c
^2*b^2/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2
*arctan(c*x)^2+1/2*I*c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))^3*arctan(c*x)^2+2*I*c*a*b/d*arctan(c*x)/x+I*c^2*a*b/d*ln(c
```

```
*x)*ln(1-I*c*x)+I*c^2*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c
^2*x^2+1)+1))^2*arctan(c*x)^2-c*a*b/d/x
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2}{x^3\,\left(d + c\,d\,x\,1\mathrm{i}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^3*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^3*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a^2}{cx^4-ix^3}\,dx + \int \frac{b^2\,\mathrm{atan}^2\,(cx)}{cx^4-ix^3}\,dx + \int \frac{2ab\,\mathrm{atan}\,(cx)}{cx^4-ix^3}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**3/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a**2/(c*x**4 - I*x**3), x) + Integral(b**2*atan(c*x)**2/(c*x**
4 - I*x**3), x) + Integral(2*a*b*atan(c*x)/(c*x**4 - I*x**3), x))/d
```

3.102 $\int \frac{(a+b\tan^{-1}(cx))^2}{x^4(d+icdx)}\,dx$

Optimal. Leaf size=365

$$-\frac{bc^3\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{11ic^3\left(a+b\tan^{-1}(cx)\right)^2}{6d}-\frac{8bc^3\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3d}+\frac{ic^3\log}{}$$

```
[Out] -1/3*b^2*c^2/d/x-1/3*b^2*c^3*arctan(c*x)/d-1/3*b*c*(a+b*arctan(c*x))/d/x^2+
I*b*c^2*(a+b*arctan(c*x))/d/x+11/6*I*c^3*(a+b*arctan(c*x))^2/d-1/3*(a+b*arc
tan(c*x))^2/d/x^3+1/2*I*c*(a+b*arctan(c*x))^2/d/x^2+c^2*(a+b*arctan(c*x))^2
/d/x-I*b^2*c^3*ln(x)/d+1/2*I*b^2*c^3*ln(c^2*x^2+1)/d-8/3*b*c^3*(a+b*arctan(
c*x))*ln(2-2/(1-I*c*x))/d+I*c^3*(a+b*arctan(c*x))^2*ln(2-2/(1+I*c*x))/d+4/3
*I*b^2*c^3*polylog(2,-1+2/(1-I*c*x))/d-b*c^3*(a+b*arctan(c*x))*polylog(2,-1
+2/(1+I*c*x))/d+1/2*I*b^2*c^3*polylog(3,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 0.97, antiderivative size = 365, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 15, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4870, 4852, 4918, 325, 203, 4924, 4868, 2447, 266, 36, 29, 31, 4884, 4994, 6610}

$$-\frac{bc^3\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{4ib^2c^3\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)}{3d}+\frac{ib^2c^3\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^4*(d + I*c*d*x)),x]
```

```
[Out] -(b^2*c^2)/(3*d*x) - (b^2*c^3*ArcTan[c*x])/(3*d) - (b*c*(a + b*ArcTan[c*x])
)/(3*d*x^2) + (I*b*c^2*(a + b*ArcTan[c*x]))/(d*x) + (((11*I)/6)*c^3*(a + b*
ArcTan[c*x])^2)/d - (a + b*ArcTan[c*x])^2/(3*d*x^3) + ((I/2)*c*(a + b*ArcTa
n[c*x])^2)/(d*x^2) + (c^2*(a + b*ArcTan[c*x])^2)/(d*x) - (I*b^2*c^3*Log[x])
/d + ((I/2)*b^2*c^3*Log[1 + c^2*x^2])/d - (8*b*c^3*(a + b*ArcTan[c*x])*Log[
2 - 2/(1 - I*c*x)])/(3*d) + (I*c^3*(a + b*ArcTan[c*x])^2*Log[2 - 2/(1 + I*c
*x)])/d + (((4*I)/3)*b^2*c^3*PolyLog[2, -1 + 2/(1 - I*c*x)])/d - (b*c^3*(a
+ b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d + ((I/2)*b^2*c^3*PolyLog
[3, -1 + 2/(1 + I*c*x)])/d
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
 LtQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^4(d+icdx)}\,dx = -\left((ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3(d+icdx)}\,dx\right)+\frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^4}\,dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{3dx^3} - c^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+icdx)}\,dx - \frac{(ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx}{d} + \frac{(2bc)}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{3dx^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \left(ic^3\right)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)}\,dx + \frac{(2b}{}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{3dx^2} + \frac{ic^3\left(a+b\tan^{-1}(cx)\right)^2}{3d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{3dx^3} + \frac{ic\left(a+b\tan\right.}{2dx^2}$$

$$= -\frac{b^2c^2}{3dx} - \frac{bc\left(a+b\tan^{-1}(cx)\right)}{3dx^2} + \frac{ibc^2\left(a+b\tan^{-1}(cx)\right)}{dx} + \frac{11ic^3\left(a+b\tan^{-1}(cx)\right)^2}{6d} -$$

$$= -\frac{b^2c^2}{3dx} - \frac{b^2c^3\tan^{-1}(cx)}{3d} - \frac{bc\left(a+b\tan^{-1}(cx)\right)}{3dx^2} + \frac{ibc^2\left(a+b\tan^{-1}(cx)\right)}{dx} + \frac{11ic^3\left(a\right.}{}$$

$$= -\frac{b^2c^2}{3dx} - \frac{b^2c^3\tan^{-1}(cx)}{3d} - \frac{bc\left(a+b\tan^{-1}(cx)\right)}{3dx^2} + \frac{ibc^2\left(a+b\tan^{-1}(cx)\right)}{dx} + \frac{11ic^3\left(a\right.}{}$$

$$= -\frac{b^2c^2}{3dx} - \frac{b^2c^3\tan^{-1}(cx)}{3d} - \frac{bc\left(a+b\tan^{-1}(cx)\right)}{3dx^2} + \frac{ibc^2\left(a+b\tan^{-1}(cx)\right)}{dx} + \frac{11ic^3\left(a\right.}{}$$

Mathematica [A] time = 1.21, size = 535, normalized size = 1.47

$$\frac{ia^2c^3\log(x)}{d}+\frac{a^2c^3\tan^{-1}(cx)}{d}+\frac{a^2c^2}{dx}-\frac{ia^2c^3\log\left(c^2x^2+1\right)}{2d}+\frac{ia^2c}{2dx^2}-\frac{a^2}{3dx^3}-\frac{2iabc^3\left(-\frac{i\left(c^2x^2+1\right)}{6c^2x^2}-\frac{4}{3}i\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)-\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^4*(d + I*c*d*x)),x]
```

```
[Out] -1/3*a^2/(d*x^3) + ((I/2)*a^2*c)/(d*x^2) + (a^2*c^2)/(d*x) + (a^2*c^3*ArcTa
n[c*x])/d + (I*a^2*c^3*Log[x])/d - ((I/2)*a^2*c^3*Log[1 + c^2*x^2])/d - ((2
*I)*a*b*c^3*(-1/2*1/(c*x) - ((I/6)*(1 + c^2*x^2))/(c^2*x^2) + (((4*I)/3)*Ar
cTan[c*x])/(c*x) - ((I/3)*(1 + c^2*x^2)*ArcTan[c*x])/(c^3*x^3) - ((1 + c^2*
x^2)*ArcTan[c*x])/(2*c^2*x^2) + (I/2)*ArcTan[c*x]^2 - ArcTan[c*x]*Log[1 - E
^((2*I)*ArcTan[c*x])] - ((4*I)/3)*Log[(c*x)/Sqrt[1 + c^2*x^2]] + (I/2)*(Arc
Tan[c*x]^2 + PolyLog[2, E^((2*I)*ArcTan[c*x])])))/d + (b^2*c^3*(Pi^3 - 8/(c
*x) + ((24*I)*ArcTan[c*x])/(c*x) - (8*(1 + c^2*x^2)*ArcTan[c*x])/(c^2*x^2)
+ (32*I)*ArcTan[c*x]^2 + (32*ArcTan[c*x]^2)/(c*x) - (8*(1 + c^2*x^2)*ArcTan
[c*x]^2)/(c^3*x^3) + ((12*I)*(1 + c^2*x^2)*ArcTan[c*x]^2)/(c^2*x^2) + (24*I
)*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 64*ArcTan[c*x]*Log[1 - E^
((2*I)*ArcTan[c*x])] - (24*I)*Log[(c*x)/Sqrt[1 + c^2*x^2]] - 24*ArcTan[c*x]
*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + (32*I)*PolyLog[2, E^((2*I)*ArcTan[c*x
])] + (12*I)*PolyLog[3, E^((-2*I)*ArcTan[c*x])]))/(24*d)
```

fricas [F] time = 1.04, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{i\,b^2\log\left(-\frac{cx+i}{cx-i}\right)^2+4\,ab\log\left(-\frac{cx+i}{cx-i}\right)-4i\,a^2}{4\,cdx^5-4i\,dx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^4/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral((I*b^2*log(-(c*x + I)/(c*x - I))^2 + 4*a*b*log(-(c*x + I)/(c*x - I
)) - 4*I*a^2)/(4*c*d*x^5 - 4*I*d*x^4), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^4/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 9.98, size = 2380, normalized size = 6.52

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^4/(d+I*c*d*x),x)
```

```
[Out] I*c*a*b/d*arctan(c*x)/x^2+1/2*c^3*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*cs
gn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2
*c^3*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*
x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*
arctan(c*x)^2+2*c^3*b^2/d*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2)
)+c^2*b^2/d*arctan(c*x)^2/x+1/2*c^3*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1
)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arc
tan(c*x)^2+1/2*c^3*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+
1))^2*arctan(c*x)^2-1/2*c^3*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))*arctan(c*x)^2-2*I*c^3*a*b/d*arctan(c*x)*ln(c*x-I)+2*I*c^3*a*b/
d*arctan(c*x)*ln(c*x)+1/2*c^3*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*
csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))*arctan(c*x)^2+c^2*a^2/d/x-1/3*b^2/d*arctan(c*x)^2/x^3+2/3*c^3*
```

```
b^2/d*arctan(c*x)^3+c^3*a^2/d*arctan(c*x)-4/3*b^2*c^3*arctan(c*x)/d-3/2*c^3
*b^2/d*Pi*arctan(c*x)^2+I*c^3*a^2/d*ln(c*x)+2*c^3*b^2/d*arctan(c*x)*polylog
(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-8/3*c^3*b^2/d*arctan(c*x)*ln(1+(1+I*c*x)/(
c^2*x^2+1)^(1/2))+I*c^2*a*b/d/x+2*c^2*a*b/d*arctan(c*x)/x+I*c^2*b^2/d*arcta
n(c*x)/x-c^3*a*b/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/2*c^3*b^2/d*Pi*csgn(I*((1
+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+I*c^3
*b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+1/2*c^3*b^2/d*Pi*csgn(
((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+I*
c^3*b^2/d*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+I*c^3*b^2/d*arcta
n(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*c^3*b^2/d*Pi*csgn(((1+I*c*x)
^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+I*c^3*b^2/d*
arctan(c*x)^2*ln(c*x)+c^3*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^
2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*c^3*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^
2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-c^3*a*b/d*ln(c*x)*ln(1+I*
c*x)+c^3*a*b/d*ln(c*x)*ln(1-I*c*x)+I*c^3*a*b/d*arctan(c*x)+1/2*I*c*b^2/d*ar
ctan(c*x)^2/x^2-1/3*I*c^3*b^2/d/(I*c*x-(c^2*x^2+1)^(1/2)+1)*(c^2*x^2+1)^(1/
2)-I*c^3*b^2/d*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+1/3*I*c^3*b^2/d/
(I*c*x+(c^2*x^2+1)^(1/2)+1)*(c^2*x^2+1)^(1/2)-I*c^3*b^2/d*arctan(c*x)^2*ln(
c*x-I)-1/3*a^2/d/x^3-1/3*c*b^2/d*arctan(c*x)/x^2-2/3*a*b/d*arctan(c*x)/x^3+
c^3*a*b/d*dilog(1-I*c*x)-8/3*c^3*a*b/d*ln(c*x)+8/3*I*c^3*b^2/d*dilog(1+(1+I
*c*x)/(c^2*x^2+1)^(1/2))+2*I*c^3*b^2/d*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2
))+2*I*c^3*b^2/d*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*I*c^3*a^2/d*ln
(c^2*x^2+1)-I*c^3*b^2/d*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)+1/2*I*c*a^2/d/x^2
-I*c^3*b^2/d*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-8/3*I*c^3*b^2/d*dilog((1+I*c
*x)/(c^2*x^2+1)^(1/2))+11/6*I*c^3*b^2/d*arctan(c*x)^2-1/3*c*a*b/d/x^2+4/3*c
^3*a*b/d*ln(c^2*x^2+1)-c^3*a*b/d*dilog(-1/2*I*(I+c*x))+1/2*c^3*a*b/d*ln(c*x
-I)^2-c^3*a*b/d*dilog(1+I*c*x)-1/2*c^3*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^
2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan
(c*x)^2+1/2*c^3*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c
*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^4/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2}{x^4\,(d+c\,d\,x\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^4*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^4*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a^2}{cx^5-ix^4}\,dx+\int \frac{b^2\,\mathrm{atan}^2\,(cx)}{cx^5-ix^4}\,dx+\int \frac{2ab\,\mathrm{atan}\,(cx)}{cx^5-ix^4}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**4/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a**2/(c*x**5 - I*x**4), x) + Integral(b**2*atan(c*x)**2/(c*x**
5 - I*x**4), x) + Integral(2*a*b*atan(c*x)/(c*x**5 - I*x**4), x))/d
```

3.103 $\int \frac{x^4\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx$

Optimal. Leaf size=433

$$\frac{4b\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^5d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^5d^2(-cx+i)}+\frac{11i\left(a+b\tan^{-1}(cx)\right)^2}{6c^5d^2}+\frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^5d^2(-cx+i)}-\frac{4i\log\left(\frac{2}{1+ic}\right.}{}$$

```
[Out] 10/3*I*b^2*polylog(2,1-2/(1+I*c*x))/c^5/d^2-1/3*b^2*x/c^4/d^2+1/2*b^2/c^5/d
^2/(I-c*x)-1/6*b^2*arctan(c*x)/c^5/d^2-I*x^2*(a+b*arctan(c*x))^2/c^3/d^2+1/
3*b*x^2*(a+b*arctan(c*x))/c^3/d^2-I*b^2*ln(c^2*x^2+1)/c^5/d^2-4*I*(a+b*arct
an(c*x))^2*ln(2/(1+I*c*x))/c^5/d^2+3*x*(a+b*arctan(c*x))^2/c^4/d^2+I*b*(a+b
*arctan(c*x))/c^5/d^2/(I-c*x)-1/3*x^3*(a+b*arctan(c*x))^2/c^2/d^2-(a+b*arct
an(c*x))^2/c^5/d^2/(I-c*x)+20/3*b*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^5/d^2
-2*I*b^2*polylog(3,1-2/(1+I*c*x))/c^5/d^2+2*I*b^2*x*arctan(c*x)/c^4/d^2+11/
6*I*(a+b*arctan(c*x))^2/c^5/d^2+4*b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*
x))/c^5/d^2+2*I*a*b*x/c^4/d^2
```

Rubi [A] time = 0.83, antiderivative size = 433, normalized size of antiderivative = 1.00, number of steps used = 33, number of rules used = 18, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.720, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 260, 4884, 321, 203, 4864, 4862, 627, 44, 4994, 6610}

$$\frac{4b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^5d^2}+\frac{10ib^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^5d^2}-\frac{2ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{c^5d^2}-\frac{x^3\left(a+b\tan^{-1}\right.}{3c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] ((2*I)*a*b*x)/(c^4*d^2) - (b^2*x)/(3*c^4*d^2) + b^2/(2*c^5*d^2*(I - c*x)) -
 (b^2*ArcTan[c*x])/(6*c^5*d^2) + ((2*I)*b^2*x*ArcTan[c*x])/(c^4*d^2) + (b*x
^2*(a + b*ArcTan[c*x]))/(3*c^3*d^2) + (I*b*(a + b*ArcTan[c*x]))/(c^5*d^2*(I
 - c*x)) + (((11*I)/6)*(a + b*ArcTan[c*x])^2)/(c^5*d^2) + (3*x*(a + b*ArcTa
n[c*x])^2)/(c^4*d^2) - (I*x^2*(a + b*ArcTan[c*x])^2)/(c^3*d^2) - (x^3*(a +
b*ArcTan[c*x])^2)/(3*c^2*d^2) - (a + b*ArcTan[c*x])^2/(c^5*d^2*(I - c*x)) +
 (20*b*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(3*c^5*d^2) - ((4*I)*(a + b*
ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c^5*d^2) - (I*b^2*Log[1 + c^2*x^2])/(c^
5*d^2) + (((10*I)/3)*b^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^5*d^2) + (4*b*(a
 + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^5*d^2) - ((2*I)*b^2*Pol
yLog[3, 1 - 2/(1 + I*c*x)])/(c^5*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
```

```
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^4\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx = \int\left(\frac{3\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2} - \frac{2ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2} - \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2} - \frac{(a+}{c^4}\right.$$

$$= \frac{(4i)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}\,dx}{c^4d^2} - \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}\,dx}{c^4d^2} + \frac{3\int \left(a+b\tan^{-1}(cx)\right)^2\,dx}{c^4d^2} - (2i)$$

$$= \frac{3x\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2} - \frac{ix^2\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2} - \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{3c^2d^2} - \frac{(a+b}{c^5d}$$

$$= \frac{3i\left(a+b\tan^{-1}(cx)\right)^2}{c^5d^2} + \frac{3x\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2} - \frac{ix^2\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2} - \frac{x^3(a+}{}$$

$$= \frac{2iabx}{c^4d^2} + \frac{bx^2\left(a+b\tan^{-1}(cx)\right)}{3c^3d^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^5d^2(i-cx)} + \frac{11i\left(a+b\tan^{-1}(cx)\right)^2}{6c^5d^2} +$$

$$= \frac{2iabx}{c^4d^2} - \frac{b^2x}{3c^4d^2} + \frac{2ib^2x\tan^{-1}(cx)}{c^4d^2} + \frac{bx^2\left(a+b\tan^{-1}(cx)\right)}{3c^3d^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^5d^2(i-cx)}$$

$$= \frac{2iabx}{c^4d^2} - \frac{b^2x}{3c^4d^2} + \frac{b^2\tan^{-1}(cx)}{3c^5d^2} + \frac{2ib^2x\tan^{-1}(cx)}{c^4d^2} + \frac{bx^2\left(a+b\tan^{-1}(cx)\right)}{3c^3d^2} + \frac{ib(}{}$$

$$= \frac{2iabx}{c^4d^2} - \frac{b^2x}{3c^4d^2} + \frac{b^2}{2c^5d^2(i-cx)} + \frac{b^2\tan^{-1}(cx)}{3c^5d^2} + \frac{2ib^2x\tan^{-1}(cx)}{c^4d^2} + \frac{bx^2(a+b\,\text{ta}}{3c^3d}$$

$$= \frac{2iabx}{c^4d^2} - \frac{b^2x}{3c^4d^2} + \frac{b^2}{2c^5d^2(i-cx)} - \frac{b^2\tan^{-1}(cx)}{6c^5d^2} + \frac{2ib^2x\tan^{-1}(cx)}{c^4d^2} + \frac{bx^2(a+b\,\text{ta}}{3c^3d}$$

Mathematica [A] time = 2.54, size = 502, normalized size = 1.16

$$-\frac{4a^2c^3x^3 + 12ia^2c^2x^2 - 24ia^2\log\left(c^2x^2+1\right) - 36a^2cx - \frac{12a^2}{cx-i} + 48a^2\tan^{-1}(cx) + 2ab\left(-2c^2x^2 + 20\log\left(c^2x^2+\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] -1/12*(-36*a^2*c*x + (12*I)*a^2*c^2*x^2 + 4*a^2*c^3*x^3 - (12*a^2)/(-I + c*
x) + 48*a^2*ArcTan[c*x] - (24*I)*a^2*Log[1 + c^2*x^2] + 2*a*b*(-2 - (12*I)*
c*x - 2*c^2*x^2 + 48*ArcTan[c*x]^2 - 3*Cos[2*ArcTan[c*x]] + 20*Log[1 + c^2*
x^2] + 24*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + 2*ArcTan[c*x]*(6*I - 18*c*x
+ (6*I)*c^2*x^2 + 2*c^3*x^3 - (3*I)*Cos[2*ArcTan[c*x]] + (24*I)*Log[1 + E^(
(2*I)*ArcTan[c*x])] - 3*Sin[2*ArcTan[c*x]]) + (3*I)*Sin[2*ArcTan[c*x]]) + b
^2*(4*c*x - 4*ArcTan[c*x] - (24*I)*c*x*ArcTan[c*x] - 4*c^2*x^2*ArcTan[c*x]
+ (52*I)*ArcTan[c*x]^2 - 36*c*x*ArcTan[c*x]^2 + (12*I)*c^2*x^2*ArcTan[c*x]^
2 + 4*c^3*x^3*ArcTan[c*x]^2 + 32*ArcTan[c*x]^3 + (3*I)*Cos[2*ArcTan[c*x]] -
 6*ArcTan[c*x]*Cos[2*ArcTan[c*x]] - (6*I)*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]]
- 80*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + (48*I)*ArcTan[c*x]^2*Log[
1 + E^((2*I)*ArcTan[c*x])] + (12*I)*Log[1 + c^2*x^2] + 8*(5*I + 6*ArcTan[c*
x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + (24*I)*PolyLog[3, -E^((2*I)*ArcTan
[c*x])] + 3*Sin[2*ArcTan[c*x]] + (6*I)*ArcTan[c*x]*Sin[2*ArcTan[c*x]] - 6*A
rcTan[c*x]^2*Sin[2*ArcTan[c*x]]))/(c^5*d^2)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^4\log\left(-\frac{cx+i}{cx-i}\right)^2 - 4i\,abx^4\log\left(-\frac{cx+i}{cx-i}\right) - 4\,a^2x^4}{4\left(c^2d^2x^2 - 2i\,cd^2x - d^2\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(b^2*x^4*log(-(c*x + I)/(c*x - I))^2 - 4*I*a*b*x^4*log(-(c*x +
 I)/(c*x - I)) - 4*a^2*x^4)/(c^2*d^2*x^2 - 2*I*c*d^2*x - d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 7.90, size = 1498, normalized size = 3.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x)
```

```
[Out] 2/c^5*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*
x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-2/c^5*b^2/d^2*Pi*csgn(I
/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^
2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/3*b^2*x/c^4/d^2-
29/6*I/c^5*b^2/d^2*arctan(c*x)^2-2*I/c^5*b^2/d^2*polylog(3,-(1+I*c*x)^2/(c^
2*x^2+1))-20/3*I/c^5*b^2/d^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-20/3*I/
c^5*b^2/d^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I/c^5*b^2/d^2*ln((1+I*
c*x)^2/(c^2*x^2+1)+1)+2*I/c^5*a^2/d^2*ln(c^2*x^2+1)-I/c^3*a^2/d^2*x^2+1/3/c
^3*b^2/d^2*arctan(c*x)*x^2+3/c^4*b^2/d^2*arctan(c*x)^2*x+4/c^5*b^2/d^2*Pi*a
rctan(c*x)^2-2/c^5*a*b/d^2*ln(c*x-I)^2+4/c^5*a*b/d^2*dilog(-1/2*I*(I+c*x))+
1/3/c^3*a*b/d^2*x^2+7/3*b^2*arctan(c*x)/c^5/d^2+6/c^4*a*b/d^2*arctan(c*x)*x
-1/2/c^4*b^2/d^2*arctan(c*x)/(c*x-I)*x-2/c^5*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c
^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-4/c^5*b^2/d^2*Pi*csg
n((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+4/c^
5*a*b/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+2/c^5*a*b/d^2*arctan(c*x)/(c*x-I)-I/
c^3*b^2/d^2*arctan(c*x)^2*x^2+2*I/c^4*b^2/d^2/(8*c*x-8*I)*x+11/12*I/c^5*a*b
/d^2*arctan(1/6*c^3*x^3+7/6*c*x)-29/6*I/c^5*a*b/d^2*arctan(c*x)+11/6*I/c^5*
a*b/d^2*arctan(1/2*c*x-1/2*I)-11/12*I/c^5*a*b/d^2*arctan(1/2*c*x)+4*I/c^5*b
^2/d^2*arctan(c*x)^2*ln(c*x-I)-1/2*I/c^5*b^2/d^2*arctan(c*x)/(c*x-I)-4*I/c^
5*b^2/d^2*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-I/c^5*a*b/d^2/(c*x-
I)+7/3/c^5*a*b/d^2-1/3*I/c^5*b^2/d^2-1/3/c^2*a^2/d^2*x^3+3/c^4*a^2/d^2*x-2/
c^5*b^2/d^2/(8*c*x-8*I)-8/3/c^5*b^2/d^2*arctan(c*x)^3-4/c^5*a^2/d^2*arctan(
c*x)+1/c^5*a^2/d^2/(c*x-I)-2/c^5*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*c
sgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+8*
I/c^5*a*b/d^2*arctan(c*x)*ln(c*x-I)-2*I/c^3*a*b/d^2*arctan(c*x)*x^2+2*I*a*b
*x/d^2/c^4+2*I*b^2*x*arctan(c*x)/d^2/c^4-11/24/c^5*a*b/d^2*ln(c^4*x^4+10*c^
2*x^2+9)-29/12/c^5*a*b/d^2*ln(c^2*x^2+1)+1/c^5*b^2/d^2*arctan(c*x)^2/(c*x-I
)+20/3/c^5*b^2/d^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+20/3/c^5
*b^2/d^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-4/c^5*b^2/d^2*arct
```

```
an(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-1/3/c^2*b^2/d^2*arctan(c*x)^2*x
^3-2/3/c^2*a*b/d^2*arctan(c*x)*x^3
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2,x)
[Out] int((x^4*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*atan(c*x))**2/(d+I*c*d*x)**2,x)
[Out] Timed out
```

3.104 $\int \frac{x^3(a+b\tan^{-1}(cx))^2}{(d+icdx)^2}\,dx$

Optimal. Leaf size=364

$$-\frac{3ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2(-cx+i)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2}-\frac{4ib\log\left(\frac{2}{1+ic\ldots}\right.}{}$$

```
[Out] a*b*x/c^3/d^2-1/2*I*b^2/c^4/d^2/(I-c*x)+1/2*I*b^2*arctan(c*x)/c^4/d^2+b^2*x
*arctan(c*x)/c^3/d^2+b*(a+b*arctan(c*x))/c^4/d^2/(I-c*x)+(a+b*arctan(c*x))^
2/c^4/d^2-2*I*x*(a+b*arctan(c*x))^2/c^3/d^2-1/2*x^2*(a+b*arctan(c*x))^2/c^2
/d^2+I*(a+b*arctan(c*x))^2/c^4/d^2/(I-c*x)-4*I*b*(a+b*arctan(c*x))*ln(2/(1+
I*c*x))/c^4/d^2-3*(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/c^4/d^2-1/2*b^2*ln(c^
2*x^2+1)/c^4/d^2+2*b^2*polylog(2,1-2/(1+I*c*x))/c^4/d^2-3*I*b*(a+b*arctan(c
*x))*polylog(2,1-2/(1+I*c*x))/c^4/d^2-3/2*b^2*polylog(3,1-2/(1+I*c*x))/c^4/
d^2
```

Rubi [A] time = 0.61, antiderivative size = 364, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 17, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 260, 4884, 4864, 4862, 627, 44, 203, 4994, 6610}

$$-\frac{3ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^2}+\frac{2b^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^4d^2}-\frac{3b^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2c^4d^2}-\frac{x^2\left(a+b\,\text{t}\ldots\right.}{2c\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] (a*b*x)/(c^3*d^2) - ((I/2)*b^2)/(c^4*d^2*(I - c*x)) + ((I/2)*b^2*ArcTan[c*x
])/(c^4*d^2) + (b^2*x*ArcTan[c*x])/(c^3*d^2) + (b*(a + b*ArcTan[c*x]))/(c^4
*d^2*(I - c*x)) + (a + b*ArcTan[c*x])^2/(c^4*d^2) - ((2*I)*x*(a + b*ArcTan[
c*x])^2)/(c^3*d^2) - (x^2*(a + b*ArcTan[c*x])^2)/(2*c^2*d^2) + (I*(a + b*Ar
cTan[c*x])^2)/(c^4*d^2*(I - c*x)) - ((4*I)*b*(a + b*ArcTan[c*x])*Log[2/(1 +
 I*c*x)])/(c^4*d^2) - (3*(a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c^4*d^2
) - (b^2*Log[1 + c^2*x^2])/(2*c^4*d^2) + (2*b^2*PolyLog[2, 1 - 2/(1 + I*c*x
)])/(c^4*d^2) - ((3*I)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])
/(c^4*d^2) - (3*b^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/(2*c^4*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx = \int\left(-\frac{2i\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2}-\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2(-i+cx)^2}+\frac{3\left(a\right.}{c^3}\right.$$

$$=\frac{i\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}dx}{c^3d^2}-\frac{(2i)\int\left(a+b\tan^{-1}(cx)\right)^2dx}{c^3d^2}+\frac{3\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}dx}{c^3d^2}-\int x$$

$$=-\frac{2ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2}-\frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2(i-cx)}-3\left(a+\right.$$

$$=\frac{2\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2}-\frac{2ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2}-\frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2}+\frac{i\left(a+b\right.}{c^4d^2}$$

$$=\frac{abx}{c^3d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2}-\frac{2ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2}-\frac{x^2\left(\right.}{}$$

$$=\frac{abx}{c^3d^2}+\frac{b^2x\tan^{-1}(cx)}{c^3d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2}-\frac{2ix\left(a+b\,\mathrm{ta}\right.}{c^3d}$$

$$=\frac{abx}{c^3d^2}+\frac{b^2x\tan^{-1}(cx)}{c^3d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2}-\frac{2ix\left(a+b\,\mathrm{ta}\right.}{c^3d}$$

$$=\frac{abx}{c^3d^2}-\frac{ib^2}{2c^4d^2(i-cx)}+\frac{b^2x\tan^{-1}(cx)}{c^3d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(i-cx)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^2}$$

$$=\frac{abx}{c^3d^2}-\frac{ib^2}{2c^4d^2(i-cx)}+\frac{ib^2\tan^{-1}(cx)}{2c^4d^2}+\frac{b^2x\tan^{-1}(cx)}{c^3d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^4d^2(i-cx)}+\left(\right.$$

Mathematica [A] time = 1.98, size = 429, normalized size = 1.18

$$-\frac{2a^2c^2x^2-6a^2\log\left(c^2x^2+1\right)+8ia^2cx+\frac{4ia^2}{cx-i}-12ia^2\tan^{-1}(cx)+2ab\left(-4i\log\left(c^2x^2+1\right)+2\tan^{-1}(cx)\left(c^2x^2\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] -1/4*((8*I)*a^2*c*x + 2*a^2*c^2*x^2 + ((4*I)*a^2)/(-I + c*x) - (12*I)*a^2*A
rcTan[c*x] - 6*a^2*Log[1 + c^2*x^2] + 2*a*b*(-2*c*x - (12*I)*ArcTan[c*x]^2
+ I*Cos[2*ArcTan[c*x]] - (4*I)*Log[1 + c^2*x^2] - (6*I)*PolyLog[2, -E^((2*I
)*ArcTan[c*x])] + 2*ArcTan[c*x]*(1 + (4*I)*c*x + c^2*x^2 - Cos[2*ArcTan[c*x
]] + 6*Log[1 + E^((2*I)*ArcTan[c*x])] + I*Sin[2*ArcTan[c*x]]) + Sin[2*ArcTa
n[c*x]]) + b^2*(-4*c*x*ArcTan[c*x] + 10*ArcTan[c*x]^2 + (8*I)*c*x*ArcTan[c*
x]^2 + 2*c^2*x^2*ArcTan[c*x]^2 - (8*I)*ArcTan[c*x]^3 + Cos[2*ArcTan[c*x]] +
 (2*I)*ArcTan[c*x]*Cos[2*ArcTan[c*x]] - 2*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]]
+ (16*I)*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 12*ArcTan[c*x]^2*Log[
1 + E^((2*I)*ArcTan[c*x])] + 2*Log[1 + c^2*x^2] + 4*(2 - (3*I)*ArcTan[c*x])
*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + 6*PolyLog[3, -E^((2*I)*ArcTan[c*x])]
- I*Sin[2*ArcTan[c*x]] + 2*ArcTan[c*x]*Sin[2*ArcTan[c*x]] + (2*I)*ArcTan[c*
x]^2*Sin[2*ArcTan[c*x]]))/(c^4*d^2)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2x^3\log\left(-\frac{cx+i}{cx-i}\right)^2-4i\,abx^3\log\left(-\frac{cx+i}{cx-i}\right)-4\,a^2x^3}{4\left(c^2d^2x^2-2i\,cd^2x-d^2\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="fricas")

[Out] integral(1/4*(b^2*x^3*log(-(c*x + I)/(c*x - I))^2 - 4*I*a*b*x^3*log(-(c*x + I)/(c*x - I)) - 4*a^2*x^3)/(c^2*d^2*x^2 - 2*I*c*d^2*x - d^2), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="giac")

[Out] Timed out

maple [C] time = 5.34, size = 1395, normalized size = 3.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x)

[Out] 3/2*I/c^4*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+a*b*x/c^3/d^2+b^2*x*arctan(c*x)/c^3/d^2+3/2*I/c^4*a*b/d^2*ln(c^2*x^2+1)+1/4*I/c^4*a*b/d^2*ln(c^4*x^4+10*c^2*x^2+9)-4*I/c^4*b^2/d^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-4*I/c^4*b^2/d^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*I/c^4*b^2/d^2*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-I/c^4*b^2/d^2*arctan(c*x)^2/(c*x-I)-1/c^2*a*b/d^2*arctan(c*x)*x^2+6/c^4*a*b/d^2*arctan(c*x)*ln(c*x-I)-2*I/c^3*b^2/d^2*arctan(c*x)^2*x-3*I/c^4*b^2/d^2*Pi*arctan(c*x)^2+3/2*I/c^4*a*b/d^2*ln(c*x-I)^2-3*I/c^4*a*b/d^2*dilog(-1/2*I*(I+c*x))-1/2/c^2*a^2/d^2*x^2-3/c^4*b^2/d^2*arctan(c*x)^2-4/c^4*b^2/d^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-4/c^4*b^2/d^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/c^4*b^2/d^2*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-3/2/c^4*b^2/d^2*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+3/2/c^4*a^2/d^2*ln(c^2*x^2+1)+3/2*I/c^4*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-4*I/c^3*a*b/d^2*arctan(c*x)*x-2*I/c^4*a*b/d^2*arctan(c*x)/(c*x-I)-3*I/c^4*a*b/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+3/2*I/c^4*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+3*I/c^4*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2/c^4*a*b/d^2*arctan(1/2*c*x)+1/c^4*a*b/d^2*arctan(1/2*c*x-1/2*I)+1/4/c^3*b^2/d^2/(c*x-I)*x-1/c^4*a*b/d^2/(c*x-I)-3/c^4*a*b/d^2*arctan(c*x)-1/2/c^2*b^2/d^2*arctan(c*x)^2*x^2-1/c^4*b^2/d^2*arctan(c*x)/(2*c*x-2*I)+3/c^4*b^2/d^2*ln(c*x-I)*arctan(c*x)^2-3/c^4*b^2/d^2*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+1/2/c^4*a*b/d^2*arctan(1/6*c^3*x^3+7/6*c*x)+3*I/c^4*a^2/d^2*arctan(c*x)-I/c^4*a^2/d^2/(c*x-I)-2*I/c^3*a^2/d^2*x-I/c^4*b^2/d^2*arctan(c*x)+1/4*I/c^4*b^2/d^2/(c*x-I)+2*I/c^4*b^2/d^2*arctan(c*x)^3+I/c^3*b^2/d^2*arctan(c*x)/(2*c*x-2*I)*x-I/c^4*a*b/d^2-3/2*I/c^4*b^2/d^2*arctan(c*x)^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="maxima")

[Out] Timed out

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3 (a + b \operatorname{atan}(c x))^2}{(d + c d x 1\mathrm{i})^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2,x)
[Out] int((x^3*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))**2/(d+I*c*d*x)**2,x)
[Out] Timed out
```

3.105 $\int \frac{x^2(a+b\tan^{-1}(cx))^2}{(d+icdx)^2}\,dx$

Optimal. Leaf size=292

$$-\frac{2b\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^2}-\frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^3d^2(-cx+i)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2(-cx+i)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^2}-\frac{2b\log\left(\frac{2}{1+icx}\right)\dots}{}$$

```
[Out] -1/2*b^2/c^3/d^2/(I-c*x)+1/2*b^2*arctan(c*x)/c^3/d^2-I*b*(a+b*arctan(c*x))/
c^3/d^2/(I-c*x)-1/2*I*(a+b*arctan(c*x))^2/c^3/d^2-x*(a+b*arctan(c*x))^2/c^2
/d^2+(a+b*arctan(c*x))^2/c^3/d^2/(I-c*x)-2*b*(a+b*arctan(c*x))*ln(2/(1+I*c*
x))/c^3/d^2+2*I*(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/c^3/d^2-I*b^2*polylog(2
,1-2/(1+I*c*x))/c^3/d^2-2*b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/c^3/
d^2+I*b^2*polylog(3,1-2/(1+I*c*x))/c^3/d^2
```

Rubi [A] time = 0.49, antiderivative size = 292, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.560$, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4864, 4862, 627, 44, 203, 4884, 4994, 6610}

$$-\frac{2b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^2}-\frac{ib^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^3d^2}+\frac{ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{c^3d^2}-\frac{ib\left(a+b\tan\dots\right)}{c^3d^2(-cx\dots)}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] -b^2/(2*c^3*d^2*(I - c*x)) + (b^2*ArcTan[c*x])/(2*c^3*d^2) - (I*b*(a + b*Ar
cTan[c*x]))/(c^3*d^2*(I - c*x)) - ((I/2)*(a + b*ArcTan[c*x])^2)/(c^3*d^2) -
 (x*(a + b*ArcTan[c*x])^2)/(c^2*d^2) + (a + b*ArcTan[c*x])^2/(c^3*d^2*(I -
c*x)) - (2*b*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^3*d^2) + ((2*I)*(a
+ b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c^3*d^2) - (I*b^2*PolyLog[2, 1 - 2/
(1 + I*c*x)])/(c^3*d^2) - (2*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*
c*x)])/(c^3*d^2) + (I*b^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/(c^3*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
```

```
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx = \int\left(-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(-i+cx)^2}-\frac{2i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(-i+cx)}\right)dx$$

$$= -\frac{(2i)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}\,dx}{c^2d^2}-\frac{\int\left(a+b\tan^{-1}(cx)\right)^2\,dx}{c^2d^2}+\frac{\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}\,dx}{c^2d^2}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2(i-cx)}+\frac{2i\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^3d^2}-\frac{(4}{}$$

$$= -\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2}-\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^2(i-cx)}+\frac{2i\left(a+b\tan^{-1}\right.}{c}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^3d^2(i-cx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^2}-\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}+\frac{\left(a+b\tan^{-1}(\right.}{c^3d^2(i-c}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^3d^2(i-cx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^2}-\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}+\frac{\left(a+b\tan^{-1}(\right.}{c^3d^2(i-c}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^3d^2(i-cx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^2}-\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}+\frac{\left(a+b\tan^{-1}(\right.}{c^3d^2(i-c}$$

$$= -\frac{b^2}{2c^3d^2(i-cx)}-\frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^3d^2(i-cx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^2}-\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2}$$

$$= -\frac{b^2}{2c^3d^2(i-cx)}+\frac{b^2\tan^{-1}(cx)}{2c^3d^2}-\frac{ib\left(a+b\tan^{-1}(cx)\right)}{c^3d^2(i-cx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^2}-\frac{x\left(a\right.}{}$$

Mathematica [A] time = 1.38, size = 362, normalized size = 1.24

$$-\frac{12ia^2\log\left(c^2x^2+1\right)+12a^2cx+\frac{12a^2}{cx-i}-24a^2\tan^{-1}(cx)+6ab\left(-2\log\left(c^2x^2+1\right)-4\text{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right)-8\tan^{-1}(c\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] -1/12*(12*a^2*c*x + (12*a^2)/(-I + c*x) - 24*a^2*ArcTan[c*x] + (12*I)*a^2*L
og[1 + c^2*x^2] + b^2*((-12*I)*ArcTan[c*x]^2 + 12*c*x*ArcTan[c*x]^2 - 16*Ar
cTan[c*x]^3 - (3*I)*Cos[2*ArcTan[c*x]] + 6*ArcTan[c*x]*Cos[2*ArcTan[c*x]] +
 (6*I)*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]] + 24*ArcTan[c*x]*Log[1 + E^((2*I)*A
rcTan[c*x])] - (24*I)*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] - 12*(I
+ 2*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])] - (12*I)*PolyLog[3, -E^
((2*I)*ArcTan[c*x])] - 3*Sin[2*ArcTan[c*x]] - (6*I)*ArcTan[c*x]*Sin[2*ArcTa
n[c*x]] + 6*ArcTan[c*x]^2*Sin[2*ArcTan[c*x]]) + 6*a*b*(-8*ArcTan[c*x]^2 + C
```

```
os[2*ArcTan[c*x]] - 2*Log[1 + c^2*x^2] - 4*PolyLog[2, -E^((2*I)*ArcTan[c*x]
)] - I*Sin[2*ArcTan[c*x]] + 2*ArcTan[c*x]*(2*c*x + I*Cos[2*ArcTan[c*x]] - (
4*I)*Log[1 + E^((2*I)*ArcTan[c*x])] + Sin[2*ArcTan[c*x]])))/(c^3*d^2)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^2\log\left(-\frac{cx+i}{cx-i}\right)^2 - 4i\,abx^2\log\left(-\frac{cx+i}{cx-i}\right) - 4\,a^2x^2}{4\left(c^2d^2x^2 - 2i\,cd^2x - d^2\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(b^2*x^2*log(-(c*x + I)/(c*x - I))^2 - 4*I*a*b*x^2*log(-(c*x +
 I)/(c*x - I)) - 4*a^2*x^2)/(c^2*d^2*x^2 - 2*I*c*d^2*x - d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.88, size = 4774, normalized size = 16.35

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x)
```

```
[Out] -2*I/c^3*b^2/d^2*arctan(c*x)^2*ln(c*x-I)+1/2*I/c^3*b^2/d^2*arctan(c*x)/(c*x
-I)+2*I/c^3*b^2/d^2*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-1/4*I/c^3
*a*b/d^2*arctan(1/6*c^3*x^3+7/6*c*x)+1/4*I/c^3*a*b/d^2*arctan(1/2*c*x)-1/2*
I/c^3*a*b/d^2*arctan(1/2*c*x-1/2*I)+3/2*I/c^3*a*b/d^2*arctan(c*x)+1/c^3*b^2
/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(
c*x)^2+2/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+
1)+1))^2*arctan(c*x)^2-2/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*
c*x)^2/(c^2*x^2+1)+1))^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2/c^3*b^2
/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*polylog
(2,-(1+I*c*x)^2/(c^2*x^2+1))-1/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/
((1+I*c*x)^2/(c^2*x^2+1)+1))^3*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+I/c^3
*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+
I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+I/c^3*
b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)
/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1
/2))+I/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/
(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^
2*x^2+1)^(1/2))-I/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*
x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln(1-I*(1+I*c*x
)/(c^2*x^2+1)^(1/2))-I/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*c
sgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln((
1+I*c*x)^2/(c^2*x^2+1)+1)-I/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*cs
gn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln(1+
I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^
2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan
(c*x)^2+1/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^
```

2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-2*I/c^3*b^2/d^2*Pi*ar
ctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+2*I/c^3*b^2/d^2*Pi*arctan(c*x)*ln(1
-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I/c^3*b^2/d^2*Pi*arctan(c*x)*ln(1+I*(1+I*
c*x)/(c^2*x^2+1)^(1/2))-4*I/c^3*a*b/d^2*arctan(c*x)*ln(c*x-I)-2/c^3*b^2/d^2
*Pi*arctan(c*x)^2+1/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn
((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*dilog(1-I*(1+I*c*x)
/(c^2*x^2+1)^(1/2))+1/2/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((
1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*polylog(2,-(1+I*c*x)^
2/(c^2*x^2+1))-1/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x
)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*dilog(1-I*(1+I*c*x)/(c^2*x^2
+1)^(1/2))-1/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/
(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^
(1/2))-1/2/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x
)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*polylog(2,-(1+I*c*x)^2/(c^2*
x^2+1))+1/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)
^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+
1)^(1/2))-1/c^2*a^2/d^2*x+2/c^3*a^2/d^2*arctan(c*x)-1/c^3*a^2/d^2/(c*x-I)+2
/c^3*b^2/d^2/(8*c*x-8*I)+1/8/c^3*a*b/d^2*ln(c^4*x^4+10*c^2*x^2+9)+3/4/c^3*a
*b/d^2*ln(c^2*x^2+1)+I/c^3*b^2/d^2*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+1/c^
3*a*b/d^2*ln(c*x-I)^2-2/c^3*a*b/d^2*dilog(-1/2*I*(I+c*x))+4/3/c^3*b^2/d^2*a
rctan(c*x)^3+2/c^3*b^2/d^2*Pi*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+2/c^3*
b^2/d^2*Pi*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/c^3*b^2/d^2*Pi*polylog(
2,-(1+I*c*x)^2/(c^2*x^2+1))-1/c^2*b^2/d^2*arctan(c*x)^2*x-3/2/c^3*b^2/d^2*a
rctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/c^3*b^2/d^2*arctan(c*x)^2/(c*x-I
)-1/2/c^3*b^2/d^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2/c^3*b
^2/d^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+2/c^3*b^2/d^2*arctan
(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+3/4*I/c^3*b^2/d^2*polylog(2,-(1+I
*c*x)^2/(c^2*x^2+1))+1/2*I/c^3*b^2/d^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2
))-I/c^3*a^2/d^2*ln(c^2*x^2+1)+3/2*I/c^3*b^2/d^2*arctan(c*x)^2+1/2*I/c^3*b^
2/d^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-2/c^3*a*b/d^2*arctan(c*x)/(c*x
-I)-2/c^3*a*b/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/c^3*b^2/d^2*Pi*csgn((1+I*c
*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*dilog(1-I*(1+I*c*x)/(c^2*x
^2+1)^(1/2))-2/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/c^3*b^2/d^2*Pi*csgn
((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*polylog(2,-(1+I*c*x
)^2/(c^2*x^2+1))+I/c^3*a*b/d^2/(c*x-I)-2/c^2*a*b/d^2*arctan(c*x)*x+1/2/c^2*
b^2/d^2*arctan(c*x)/(c*x-I)*x-2*I/c^2*b^2/d^2/(8*c*x-8*I)*x-1/c^3*b^2/d^2*P
i*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1
+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*dilog(1-I*(1+I*c*x)/(c^2
*x^2+1)^(1/2))+I/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(
c^2*x^2+1)+1))^3*arctan(c*x)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/c^3*b^2/d^2*Pi
*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+
I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*dilog(1+I*(1+I*c*x)/(c^2*
x^2+1)^(1/2))+1/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+
I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))*arctan(c*x)^2-2*I/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*
x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-I/c^
3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*ar
ctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I/c^3*b^2/d^2*Pi*csgn((1+I*
c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)*ln((1+I*c*x)^
2/(c^2*x^2+1)+1)-I/c^3*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2
/(c^2*x^2+1)+1))^3*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I/c^3*
b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arct
an(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2/c^3*b^2/d^2*Pi*csgn(I/((1+I
*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2
*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+I/
c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^
2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)
*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-I/c^3*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^

```
2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c
*x)^2/(c^2*x^2+1)+1))*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-I/c^3
*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1
))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)*ln
(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))
```

maxima [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2,x)
```

```
[Out] int((x^2*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))**2/(d+I*c*d*x)**2,x)
```

```
[Out] Timed out
```

3.106 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx$

Optimal. Leaf size=216

$$\frac{ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d^2}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(-cx+i)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(-cx+i)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a+\right.}{c^2}$$

```
[Out] 1/2*I*b^2/c^2/d^2/(I-c*x)-1/2*I*b^2*arctan(c*x)/c^2/d^2-b*(a+b*arctan(c*x))
/c^2/d^2/(I-c*x)+1/2*(a+b*arctan(c*x))^2/c^2/d^2-I*(a+b*arctan(c*x))^2/c^2/
d^2/(I-c*x)+(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/c^2/d^2+I*b*(a+b*arctan(c*x
))*polylog(2,1-2/(1+I*c*x))/c^2/d^2+1/2*b^2*polylog(3,1-2/(1+I*c*x))/c^2/d^
2
```

Rubi [A] time = 0.34, antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4876, 4864, 4862, 627, 44, 203, 4884, 4854, 4994, 6610}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d^2}+\frac{b^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2c^2d^2}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(-cx+i)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(-cx+i)}+$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] ((I/2)*b^2)/(c^2*d^2*(I - c*x)) - ((I/2)*b^2*ArcTan[c*x])/(c^2*d^2) - (b*(a
 + b*ArcTan[c*x]))/(c^2*d^2*(I - c*x)) + (a + b*ArcTan[c*x])^2/(2*c^2*d^2)
- (I*(a + b*ArcTan[c*x])^2)/(c^2*d^2*(I - c*x)) + ((a + b*ArcTan[c*x])^2*Lo
g[2/(1 + I*c*x)])/(c^2*d^2) + (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1
+ I*c*x)])/(c^2*d^2) + (b^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/(2*c^2*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx = \int \left(-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(-i+cx)^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(-i+cx)}\right)dx$$

$$= -\frac{i\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}dx}{cd^2} - \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}dx}{cd^2}$$

$$= -\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^2d^2} - \frac{(2ib)\int\left(-\frac{i\left(a+b\tan^{-1}(cx)\right)}{2(-i+cx)^2} + \frac{i(}{}\right.}{cd^2}$$

$$= -\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^2d^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\right.}{c^2d^2}$$

$$= -\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right.}{c^2d^2}$$

$$= -\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right.}{c^2d^2}$$

$$= -\frac{b\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right.}{c^2d^2}$$

$$= \frac{ib^2}{2c^2d^2(i-cx)} - \frac{b\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^2(i-cx)} + \frac{(a}{}$$

$$= \frac{ib^2}{2c^2d^2(i-cx)} - \frac{ib^2\tan^{-1}(cx)}{2c^2d^2} - \frac{b\left(a+b\tan^{-1}(cx)\right)}{c^2d^2(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d^2} - \frac{i\left(a+b\,\mathrm{t}\right.}{c^2d^2(}$$

Mathematica [A] time = 0.85, size = 300, normalized size = 1.39

$$\frac{-6a^2\log\left(c^2x^2+1\right) + \frac{12ia^2}{cx-i} - 12ia^2\tan^{-1}(cx) - 6iab\left(2\mathrm{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right) + 4\tan^{-1}(cx)^2 + i\sin\left(2\tan^{-1}(cx)\right) - \cos\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^2,x]
```

```
[Out] (((12*I)*a^2)/(-I + c*x) - (12*I)*a^2*ArcTan[c*x] - 6*a^2*Log[1 + c^2*x^2]
- (6*I)*a*b*(4*ArcTan[c*x]^2 - Cos[2*ArcTan[c*x]] + 2*PolyLog[2, -E^((2*I)*
ArcTan[c*x])] - (2*I)*ArcTan[c*x]*(Cos[2*ArcTan[c*x]] - 2*Log[1 + E^((2*I)*
ArcTan[c*x])] - I*Sin[2*ArcTan[c*x]]) + I*Sin[2*ArcTan[c*x]]) + b^2*((-8*I)
*ArcTan[c*x]^3 + 3*Cos[2*ArcTan[c*x]] + (6*I)*ArcTan[c*x]*Cos[2*ArcTan[c*x]
] - 6*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]] + 12*ArcTan[c*x]^2*Log[1 + E^((2*I)*
ArcTan[c*x])] - (12*I)*ArcTan[c*x]*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + 6*P
olyLog[3, -E^((2*I)*ArcTan[c*x])] - (3*I)*Sin[2*ArcTan[c*x]] + 6*ArcTan[c*x
]*Sin[2*ArcTan[c*x]] + (6*I)*ArcTan[c*x]^2*Sin[2*ArcTan[c*x]]))/(12*c^2*d^2
)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2x\log\left(-\frac{cx+i}{cx-i}\right)^2 - 4i\,abx\log\left(-\frac{cx+i}{cx-i}\right) - 4\,a^2x}{4\left(c^2d^2x^2 - 2i\,cd^2x - d^2\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(b^2*x*log(-(c*x + I)/(c*x - I))^2 - 4*I*a*b*x*log(-(c*x + I)/
(c*x - I)) - 4*a^2*x)/(c^2*d^2*x^2 - 2*I*c*d^2*x - d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.40, size = 1059, normalized size = 4.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x)
```

```
[Out] -1/2*I/c^2*b^2/d^2*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+
1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*arct
an(c*x)^2-1/4*I/c^2*a*b/d^2*ln(c^2*x^2+1)-1/2*I/c^2*a*b/d^2*ln(c*x-I)^2+I/c
^2*b^2/d^2*arctan(c*x)^2/(c*x-I)-2/c^2*a*b/d^2*arctan(c*x)*ln(c*x-I)+I/c^2*
b^2/d^2*Pi*arctan(c*x)^2+I/c^2*a*b/d^2*dilog(-1/2*I*(I+c*x))-I/c^2*b^2/d^2*
arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+1/8*I/c^2*a*b/d^2*ln(c^4*x^
4+10*c^2*x^2+9)+I/c^2*a^2/d^2/(c*x-I)+1/2/c^2*b^2/d^2*arctan(c*x)^2+1/2/c^2
*b^2/d^2*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))-1/2/c^2*a^2/d^2*ln(c^2*x^2+1)-
I/c^2*b^2/d^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*P
i*arctan(c*x)^2-2*I/c*b^2/d^2*arctan(c*x)/(4*c*x-4*I)*x+2*I/c^2*a*b/d^2*arc
tan(c*x)/(c*x-I)-1/2*I/c^2*b^2/d^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^
2/(c^2*x^2+1)+1))^3*Pi*arctan(c*x)^2+1/4/c^2*a*b/d^2*arctan(1/6*c^3*x^3+7/6
*c*x)-1/4/c*b^2/d^2/(c*x-I)*x+1/c^2*a*b/d^2/(c*x-I)+1/2/c^2*a*b/d^2*arctan(
c*x)-1/4/c^2*a*b/d^2*arctan(1/2*c*x)+1/2/c^2*a*b/d^2*arctan(1/2*c*x-1/2*I)+
2/c^2*b^2/d^2*arctan(c*x)/(4*c*x-4*I)-1/c^2*b^2/d^2*ln(c*x-I)*arctan(c*x)^2
+1/c^2*b^2/d^2*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-2/3*I/c^2*b^2/
d^2*arctan(c*x)^3-1/4*I/c^2*b^2/d^2/(c*x-I)-I/c^2*a^2/d^2*arctan(c*x)+I/c^2
*a*b/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/2*I/c^2*b^2/d^2*csgn((1+I*c*x)^2/(c
^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*Pi*a
rctan(c*x)^2+1/2*I/c^2*b^2/d^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c
^2*x^2+1)+1))^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*arctan(c*x)^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2,x)
```

```
[Out] int((x*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))**2/(d+I*c*d*x)**2,x)
```

```
[Out] Timed out
```

3.107 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx$

Optimal. Leaf size=122

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)}{cd^2(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2}+\frac{b^2}{2cd^2(-cx+i)}-\frac{b^2\tan^{-1}(cx)}{2cd^2}$$

```
[Out] 1/2*b^2/c/d^2/(I-c*x)-1/2*b^2*arctan(c*x)/c/d^2+I*b*(a+b*arctan(c*x))/c/d^2
/(I-c*x)-1/2*I*(a+b*arctan(c*x))^2/c/d^2+I*(a+b*arctan(c*x))^2/c/d^2/(1+I*c
*x)
```

Rubi [A] time = 0.12, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4864, 4862, 627, 44, 203, 4884}

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)}{cd^2(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2}+\frac{b^2}{2cd^2(-cx+i)}-\frac{b^2\tan^{-1}(cx)}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(d + I*c*d*x)^2,x]
```

```
[Out] b^2/(2*c*d^2*(I - c*x)) - (b^2*ArcTan[c*x])/(2*c*d^2) + (I*b*(a + b*ArcTan[
c*x]))/(c*d^2*(I - c*x)) - ((I/2)*(a + b*ArcTan[c*x])^2)/(c*d^2) + (I*(a +
b*ArcTan[c*x])^2)/(c*d^2*(1 + I*c*x))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
```

```
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^2}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)} - \frac{(2ib)\int\left(-\frac{a+b\tan^{-1}(cx)}{2d(-i+cx)^2}+\frac{a+b\tan^{-1}(cx)}{2d\left(1+c^2x^2\right)}\right)dx}{d}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)} + \frac{(ib)\int\frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{d^2} - \frac{(ib)\int\frac{a+b\tan^{-1}(cx)}{1+c^2x^2}\,dx}{d^2}$$

$$= \frac{ib\left(a+b\tan^{-1}(cx)\right)}{cd^2(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)} + \frac{\left(ib^2\right)\int\frac{1}{(-i+cx)\left(1+c^2\ldots\right.}}{d^2}$$

$$= \frac{ib\left(a+b\tan^{-1}(cx)\right)}{cd^2(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)} + \frac{\left(ib^2\right)\int\frac{1}{(-i+cx)^2(i+c\ldots}}{d^2}$$

$$= \frac{ib\left(a+b\tan^{-1}(cx)\right)}{cd^2(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)} + \frac{\left(ib^2\right)\int\left(-\frac{i}{2(-i+cx)^2}\ldots\right.}{d^2}$$

$$= \frac{b^2}{2cd^2(i-cx)} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{cd^2(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+icx)} - \frac{b^2}{\ldots}$$

$$= \frac{b^2}{2cd^2(i-cx)} - \frac{b^2\tan^{-1}(cx)}{2cd^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{cd^2(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{cd^2(1+\ldots}$$

Mathematica [A] time = 0.20, size = 72, normalized size = 0.59

$$-\frac{-2a^2+b(b+2ia)(cx+i)\tan^{-1}(cx)+2iab+b^2(-1+icx)\tan^{-1}(cx)^2+b^2}{2cd^2(cx-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(d + I*c*d*x)^2,x]
```

```
[Out] -1/2*(-2*a^2 + (2*I)*a*b + b^2 + b*((2*I)*a + b)*(I + c*x)*ArcTan[c*x] + b^
2*(-1 + I*c*x)*ArcTan[c*x]^2)/(c*d^2*(-I + c*x))
```

fricas [A] time = 0.47, size = 104, normalized size = 0.85

$$\frac{\left(ib^2cx-b^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+8a^2-8iab-4b^2+\left(\left(4ab-2ib^2\right)cx+4iab+2b^2\right)\log\left(-\frac{cx+i}{cx-i}\right)}{8c^2d^2x-8icd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] ((I*b^2*c*x - b^2)*log(-(c*x + I)/(c*x - I))^2 + 8*a^2 - 8*I*a*b - 4*b^2 +
((4*a*b - 2*I*b^2)*c*x + 4*I*a*b + 2*b^2)*log(-(c*x + I)/(c*x - I)))/(8*c^2
*d^2*x - 8*I*c*d^2)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**B**] time = 0.08, size = 344, normalized size = 2.82

$$\frac{ia^2}{c\,d^2\,(icx+1)}+\frac{ib^2\arctan(cx)^2}{c\,d^2\,(icx+1)}+\frac{b^2\arctan(cx)\ln(cx+i)}{2c\,d^2}-\frac{b^2\arctan(cx)\ln(cx-i)}{2c\,d^2}-\frac{ib^2\arctan(cx)}{c\,d^2\,(cx-i)}+\frac{ib^2\ln(c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x)
```

```
[Out] I/c*a^2/d^2/(1+I*c*x)+I/c*b^2/d^2/(1+I*c*x)*arctan(c*x)^2+1/2/c*b^2/d^2*arc
tan(c*x)*ln(I+c*x)-1/2/c*b^2/d^2*arctan(c*x)*ln(c*x-I)-I/c*b^2/d^2*arctan(c
*x)/(c*x-I)+1/4*I/c*b^2/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/8*I/c*b^2/d^2*ln
(c*x-I)^2-1/2*b^2*arctan(c*x)/c/d^2-1/2/c*b^2/d^2/(c*x-I)-1/8*I/c*b^2/d^2*l
n(I+c*x)^2+1/4*I/c*b^2/d^2*ln(-1/2*I*(-c*x+I))*ln(I+c*x)-1/4*I/c*b^2/d^2*ln
(-1/2*I*(-c*x+I))*ln(-1/2*I*(I+c*x))+2*I/c*a*b/d^2/(1+I*c*x)*arctan(c*x)-I/
c*a*b/d^2*arctan(c*x)-I/c*a*b/d^2/(c*x-I)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2}{(d+c\,d\,x\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(d + c*d*x*1i)^2,x)
```

```
[Out] int((a + b*atan(c*x))^2/(d + c*d*x*1i)^2, x)
```

sympy [**B**] time = 10.37, size = 301, normalized size = 2.47

$$\frac{b\,(2a-ib)\log\left(-\frac{b(2a-ib)}{c}+x\left(2iab+b^2\right)\right)}{4cd^2}-\frac{b\,(2a-ib)\log\left(\frac{b(2a-ib)}{c}+x\left(2iab+b^2\right)\right)}{4cd^2}+\frac{\left(-2iab-b^2\right)\log(icx+1)}{2c^2d^2x-2icd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/(d+I*c*d*x)**2,x)
```

```
[Out] b*(2*a - I*b)*log(-b*(2*a - I*b)/c + x*(2*I*a*b + b**2))/(4*c*d**2) - b*(2*
a - I*b)*log(b*(2*a - I*b)/c + x*(2*I*a*b + b**2))/(4*c*d**2) + (-2*I*a*b -
 b**2)*log(I*c*x + 1)/(2*c**2*d**2*x - 2*I*c*d**2) + (-b**2*c*x - I*b**2)*l
og(-I*c*x + 1)**2/(8*I*c**2*d**2*x + 8*c*d**2) + (-4*a*b + b**2*c*x*log(I*c
*x + 1) + I*b**2*log(I*c*x + 1) + 2*I*b**2)*log(-I*c*x + 1)/(4*I*c**2*d**2*
x + 4*c*d**2) + (I*b**2*c*x - b**2)*log(I*c*x + 1)**2/(8*c**2*d**2*x - 8*I*
c*d**2) - (-2*a**2 + 2*I*a*b + b**2)/(2*c**2*d**2*x - 2*I*c*d**2)
```

3.108 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)^2}\,dx$

Optimal. Leaf size=221

$$\frac{ib\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^2(-cx+i)}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2}+\frac{\log\left(\frac{2}{1+icx}\right)\left(a\right.}{d}$$

```
[Out] -1/2*I*b^2/d^2/(I-c*x)+1/2*I*b^2*arctan(c*x)/d^2+b*(a+b*arctan(c*x))/d^2/(I
-c*x)-1/2*(a+b*arctan(c*x))^2/d^2+I*(a+b*arctan(c*x))^2/d^2/(I-c*x)-2*(a+b*
arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d^2+(a+b*arctan(c*x))^2*ln(2/(1+I*c*
x))/d^2+I*b*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d^2+1/2*b^2*polylog
(3,-1+2/(1+I*c*x))/d^2
```

Rubi [A] time = 0.62, antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {4876, 4850, 4988, 4884, 4994, 6610, 4864, 4862, 627, 44, 203, 4854}

$$\frac{ib\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{b^2\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d^2}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right.}{d^2(-cx+i)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x*(d + I*c*d*x)^2),x]
```

```
[Out] ((-I/2)*b^2)/(d^2*(I - c*x)) + ((I/2)*b^2*ArcTan[c*x])/d^2 + (b*(a + b*ArcT
an[c*x]))/(d^2*(I - c*x)) - (a + b*ArcTan[c*x])^2/(2*d^2) + (I*(a + b*ArcTa
n[c*x])^2)/(d^2*(I - c*x)) + (2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*
c*x)])/d^2 + ((a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/d^2 + (I*b*(a + b*A
rcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d^2 + (b^2*PolyLog[3, -1 + 2/(1
 + I*c*x)])/(2*d^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
```

```
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)^2}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2(-i+cx)^2} - \frac{c\left(a+b\tan^{-1}(cx)\right)^2}{d^2(-i+cx)} \right) dx$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}dx}{d^2} + \frac{(ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}dx}{d^2} - \frac{c\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}dx}{d^2}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2 \log}{d^2}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2 \log}{d^2}$$

$$= \frac{b\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2}{d}$$

$$= \frac{b\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2}{d}$$

$$= \frac{b\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2}{d}$$

$$= -\frac{ib^2}{2d^2(i-cx)} + \frac{b\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} + \frac{2(a}{}$$

$$= -\frac{ib^2}{2d^2(i-cx)} + \frac{ib^2\tan^{-1}(cx)}{2d^2} + \frac{b\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} + \frac{i\left(a+b\tan\right.}{d^2(i-}$$

Mathematica [A] time = 1.04, size = 299, normalized size = 1.35

$$-12a^2\log\left(c^2x^2+1\right) - \frac{24ia^2}{cx-i} + 24a^2\log(cx) - 24ia^2\tan^{-1}(cx) - 12ab\left(2i\text{Li}_2\left(e^{2i\tan^{-1}(cx)}\right) + 4i\tan^{-1}(cx)^2 + \sin\left(2\text{ t}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x*(d + I*c*d*x)^2),x]
```

```
[Out] (((-24*I)*a^2)/(-I + c*x) - (24*I)*a^2*ArcTan[c*x] + 24*a^2*Log[c*x] - 12*a
^2*Log[1 + c^2*x^2] - 12*a*b*((4*I)*ArcTan[c*x]^2 + I*Cos[2*ArcTan[c*x]] +
(2*I)*PolyLog[2, E^((2*I)*ArcTan[c*x])] - 2*ArcTan[c*x]*(Cos[2*ArcTan[c*x]]
 + 2*Log[1 - E^((2*I)*ArcTan[c*x])] - I*Sin[2*ArcTan[c*x]]) + Sin[2*ArcTan[
c*x]]) + b^2*((-I)*Pi^3 - 6*Cos[2*ArcTan[c*x]] - (12*I)*ArcTan[c*x]*Cos[2*A
rcTan[c*x]] + 12*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]] + 24*ArcTan[c*x]^2*Log[1
- E^((-2*I)*ArcTan[c*x])] + (24*I)*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[
c*x])] + 12*PolyLog[3, E^((-2*I)*ArcTan[c*x])] + (6*I)*Sin[2*ArcTan[c*x]] -
 12*ArcTan[c*x]*Sin[2*ArcTan[c*x]] - (12*I)*ArcTan[c*x]^2*Sin[2*ArcTan[c*x]
]))/(24*d^2)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(-\frac{cx+i}{cx-i}\right)^2 - 4i\,ab\log\left(-\frac{cx+i}{cx-i}\right) - 4\,a^2}{4\left(c^2d^2x^3 - 2i\,cd^2x^2 - d^2x\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(b^2*log(-(c*x + I)/(c*x - I))^2 - 4*I*a*b*log(-(c*x + I)/(c*x
 - I)) - 4*a^2)/(c^2*d^2*x^3 - 2*I*c*d^2*x^2 - d^2*x), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.54, size = 1921, normalized size = 8.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^2,x)
```

```
[Out] 1/2*I*b^2/d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1
)+1))^3*arctan(c*x)^2+I*a*b/d^2*ln(c*x)*ln(1+I*c*x)-2*I*a*b/d^2*arctan(c*x)
/(c*x-I)-I*a*b/d^2*ln(c*x)*ln(1-I*c*x)-1/2*I*b^2/d^2*Pi*csgn(((1+I*c*x)^2/(
c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*b^2/d^2*Pi
*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*b^2/d^2*arctan(c*x)^2-1/2*a^2
/d^2*ln(c^2*x^2+1)+a^2/d^2*ln(c*x)+2*b^2/d^2*polylog(3,(1+I*c*x)/(c^2*x^2+1
)^(1/2))+2*b^2/d^2*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*I*b^2/d^2*cs
gn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*Pi*arctan(c*x)^2-
I*b^2/d^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*Pi*ar
ctan(c*x)^2+I*a*b/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/2*I*b^2/d^2*Pi*csgn(((
1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-1/2*
I*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x
^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+2*a*b/d^2*arctan(c*x)
*ln(c*x)+1/4*b^2/d^2/(c*x-I)*c*x+2*I*b^2/d^2*arctan(c*x)/(4*c*x-4*I)*c*x-1/
2*I*a*b/d^2*ln(c*x-I)^2+I*a*b/d^2*dilog(-1/2*I*(I+c*x))-I*b^2/d^2*arctan(c*
x)^2/(c*x-I)-2*a*b/d^2*arctan(c*x)*ln(c*x-I)+I*a*b/d^2*dilog(1+I*c*x)-I*a*b
/d^2*dilog(1-I*c*x)-2*I*b^2/d^2*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1
)^(1/2))-2*I*b^2/d^2*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+3/2
*I*b^2/d^2*Pi*arctan(c*x)^2-1/2*I*b^2/d^2*csgn((1+I*c*x)^2/(c^2*x^2+1))*csg
n((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*Pi*arctan(c*x)^2+1
/2*I*b^2/d^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*cs
gn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*arctan(c*x)^2-1/2*I*b^2/d^2*Pi*csgn(I*
((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/
(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+b^2/d^2*arctan(
c*x)^2*ln(c*x)-b^2/d^2*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+b^2/d^2*
arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2/d^2*arctan(c*x)^2*ln(1-
(1+I*c*x)/(c^2*x^2+1)^(1/2))-a*b/d^2/(c*x-I)-a*b/d^2*arctan(c*x)-2*b^2/d^2*
arctan(c*x)/(4*c*x-4*I)-2/3*I*b^2/d^2*arctan(c*x)^3-I*a^2/d^2*arctan(c*x)-b
^2/d^2*ln(c*x-I)*arctan(c*x)^2+b^2/d^2*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^
2*x^2+1))+1/2*I*b^2/d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/
(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1
))*arctan(c*x)^2+1/4*I*b^2/d^2/(c*x-I)-I*a^2/d^2/(c*x-I)-1/2*I*b^2/d^2*csgn
((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^
2+1)+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*arctan(c*x)^2+1/2*I*b^2/d^2
*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))
*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x
)^2
```

maxima [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2}{x\,(d + c\,d\,x\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x*(d + c*d*x*1i)^2),x)
[Out] int((a + b*atan(c*x))^2/(x*(d + c*d*x*1i)^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x/(d+I*c*d*x)**2,x)
[Out] Timed out
```

3.109 $\int \frac{(a+b\tan^{-1}(cx))^2}{x^2(d+icdx)^2}\,dx$

Optimal. Leaf size=306

$$\frac{2bc\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ibc\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{c\left(a+b\tan^{-1}(cx)\right)^2}{d^2(-cx+i)}-\frac{ic\left(a+b\right.}{}$$

```
[Out] -1/2*b^2*c/d^2/(I-c*x)+1/2*b^2*c*arctan(c*x)/d^2-I*b*c*(a+b*arctan(c*x))/d^
2/(I-c*x)-1/2*I*c*(a+b*arctan(c*x))^2/d^2-(a+b*arctan(c*x))^2/d^2/x+c*(a+b*
arctan(c*x))^2/d^2/(I-c*x)+4*I*c*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x)
)/d^2-2*I*c*(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/d^2+2*b*c*(a+b*arctan(c*x))
*ln(2-2/(1-I*c*x))/d^2-I*b^2*c*polylog(2,-1+2/(1-I*c*x))/d^2+2*b*c*(a+b*arc
tan(c*x))*polylog(2,-1+2/(1+I*c*x))/d^2-I*b^2*c*polylog(3,-1+2/(1+I*c*x))/d
^2
```

Rubi [A] time = 0.77, antiderivative size = 306, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {4876, 4852, 4924, 4868, 2447, 4850, 4988, 4884, 4994, 6610, 4864, 4862, 627, 44, 203, 4854}

$$\frac{2bc\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ib^2c\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)}{d^2}-\frac{ib^2c\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{d^2}-\frac{ibc}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^2*(d + I*c*d*x)^2),x]
```

```
[Out] -(b^2*c)/(2*d^2*(I - c*x)) + (b^2*c*ArcTan[c*x])/(2*d^2) - (I*b*c*(a + b*Ar
cTan[c*x]))/(d^2*(I - c*x)) - ((I/2)*c*(a + b*ArcTan[c*x])^2)/d^2 - (a + b*
ArcTan[c*x])^2/(d^2*x) + (c*(a + b*ArcTan[c*x])^2)/(d^2*(I - c*x)) - ((4*I)
*c*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d^2 - ((2*I)*c*(a + b*
ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/d^2 + (2*b*c*(a + b*ArcTan[c*x])*Log[2 -
 2/(1 - I*c*x)])/d^2 - (I*b^2*c*PolyLog[2, -1 + 2/(1 - I*c*x)])/d^2 + (2*b*
c*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d^2 - (I*b^2*c*PolyLo
g[3, -1 + 2/(1 + I*c*x)])/d^2
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+icdx)^2}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x^2} - \frac{2ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2(-i+cx)^2} + \frac{2ic^2\left(a+b\right.}{d^2(-i}\right.$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}dx}{d^2} - \frac{(2ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}dx}{d^2} + \frac{\left(2ic^2\right)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}dx}{d^2} + \frac{c^2\int \frac{(a+b}{(-}}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{c\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} - \frac{4ic\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{c\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} - \frac{4ic\left(a+b\tan^{-1}(\right.}{}$$

$$= -\frac{ibc\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{c\left(a+b\tan^{-1}(c\right.}{d^2(i-cx)}$$

$$= -\frac{ibc\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{c\left(a+b\tan^{-1}(c\right.}{d^2(i-cx)}$$

$$= -\frac{ibc\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{c\left(a+b\tan^{-1}(c\right.}{d^2(i-cx)}$$

$$= -\frac{b^2c}{2d^2(i-cx)} - \frac{ibc\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{c}{}$$

$$= -\frac{b^2c}{2d^2(i-cx)} + \frac{b^2c\tan^{-1}(cx)}{2d^2} - \frac{ibc\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\right.}{}$$

Mathematica [A] time = 2.70, size = 398, normalized size = 1.30

$$-\frac{-12ia^2c\log\left(c^2x^2+1\right) + \frac{12a^2c}{cx-i} + 24ia^2c\log(cx) + 24a^2c\tan^{-1}(cx) + \frac{12a^2}{x} + 6abc\left(-4\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right) + 4\mathrm{Li}_2\left(e^{2i\tan}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^2*(d + I*c*d*x)^2),x]
```

```
[Out] -1/12*((12*a^2)/x + (12*a^2*c)/(-I + c*x) + 24*a^2*c*ArcTan[c*x] + (24*I)*a
^2*c*Log[c*x] - (12*I)*a^2*c*Log[1 + c^2*x^2] + b^2*c*(Pi^3 + (12*I)*ArcTan
[c*x]^2 + (12*ArcTan[c*x]^2)/(c*x) - (3*I)*Cos[2*ArcTan[c*x]] + 6*ArcTan[c*
x]*Cos[2*ArcTan[c*x]] + (6*I)*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]] + (24*I)*Arc
Tan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 24*ArcTan[c*x]*Log[1 - E^((2*I
)*ArcTan[c*x])] - 24*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + (12*I
)*PolyLog[2, E^((2*I)*ArcTan[c*x])] + (12*I)*PolyLog[3, E^((-2*I)*ArcTan[c*
x])] - 3*Sin[2*ArcTan[c*x]] - (6*I)*ArcTan[c*x]*Sin[2*ArcTan[c*x]] + 6*ArcT
an[c*x]^2*Sin[2*ArcTan[c*x]]) + 6*a*b*c*(8*ArcTan[c*x]^2 + Cos[2*ArcTan[c*x
]] - 4*Log[(c*x)/Sqrt[1 + c^2*x^2]] + 4*PolyLog[2, E^((2*I)*ArcTan[c*x])] -
 I*Sin[2*ArcTan[c*x]] + ArcTan[c*x]*(4/(c*x) + (2*I)*Cos[2*ArcTan[c*x]] + (
8*I)*Log[1 - E^((2*I)*ArcTan[c*x])] + 2*Sin[2*ArcTan[c*x]])))/d^2
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(-\frac{cx+i}{cx-i}\right)^2 - 4i\,ab\log\left(-\frac{cx+i}{cx-i}\right) - 4\,a^2}{4\left(c^2d^2x^4 - 2i\,cd^2x^3 - d^2x^2\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(b^2*log(-(c*x + I)/(c*x - I))^2 - 4*I*a*b*log(-(c*x + I)/(c*x
 - I)) - 4*a^2)/(c^2*d^2*x^4 - 2*I*c*d^2*x^3 - d^2*x^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 1.53, size = 9420, normalized size = 30.78

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^2,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2}{x^2\,(d+c\,d\,x\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^2*(d + c*d*x*1i)^2),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^2*(d + c*d*x*1i)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**2/(d+I*c*d*x)**2,x)
```

```
[Out] Timed out
```

3.110 $\int \frac{(a+b\tan^{-1}(cx))^2}{x^3(d+icdx)^2}\,dx$

Optimal. Leaf size=403

$$-\frac{3ibc^2\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ic^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2(-cx+i)}-\frac{2c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{bc^2\left(a+b\tan^{-1}(cx)\right)}{d^2(-cx+i)}-\frac{3c}{}$$

```
[Out] -3*I*b*c^2*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d^2+2*I*c*(a+b*arcta
n(c*x))^2/d^2/x-b*c*(a+b*arctan(c*x))/d^2/x-b*c^2*(a+b*arctan(c*x))/d^2/(I-
c*x)-2*c^2*(a+b*arctan(c*x))^2/d^2-1/2*(a+b*arctan(c*x))^2/d^2/x^2-I*c^2*(a
+b*arctan(c*x))^2/d^2/(I-c*x)+1/2*I*b^2*c^2/d^2/(I-c*x)+6*c^2*(a+b*arctan(c
*x))^2*arctanh(-1+2/(1+I*c*x))/d^2+b^2*c^2*ln(x)/d^2-3*c^2*(a+b*arctan(c*x)
)^2*ln(2/(1+I*c*x))/d^2-1/2*b^2*c^2*ln(c^2*x^2+1)/d^2-1/2*I*b^2*c^2*arctan(
c*x)/d^2-2*b^2*c^2*polylog(2,-1+2/(1-I*c*x))/d^2-4*I*b*c^2*(a+b*arctan(c*x)
)*ln(2-2/(1-I*c*x))/d^2-3/2*b^2*c^2*polylog(3,-1+2/(1+I*c*x))/d^2
```

Rubi [A] time = 0.93, antiderivative size = 403, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 21, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.840, Rules used = {4876, 4852, 4918, 266, 36, 29, 31, 4884, 4924, 4868, 2447, 4850, 4988, 4994, 6610, 4864, 4862, 627, 44, 203, 4854}

$$-\frac{3ibc^2\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{2b^2c^2\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)}{d^2}-\frac{3b^2c^2\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^3*(d + I*c*d*x)^2),x]
```

```
[Out] ((I/2)*b^2*c^2)/(d^2*(I - c*x)) - ((I/2)*b^2*c^2*ArcTan[c*x])/d^2 - (b*c*(a
 + b*ArcTan[c*x]))/(d^2*x) - (b*c^2*(a + b*ArcTan[c*x]))/(d^2*(I - c*x)) -
(2*c^2*(a + b*ArcTan[c*x])^2)/d^2 - (a + b*ArcTan[c*x])^2/(2*d^2*x^2) + ((2
*I)*c*(a + b*ArcTan[c*x])^2)/(d^2*x) - (I*c^2*(a + b*ArcTan[c*x])^2)/(d^2*(
I - c*x)) - (6*c^2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d^2 +
(b^2*c^2*Log[x])/d^2 - (3*c^2*(a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/d^2
 - (b^2*c^2*Log[1 + c^2*x^2])/(2*d^2) - ((4*I)*b*c^2*(a + b*ArcTan[c*x])*Lo
g[2 - 2/(1 - I*c*x)])/d^2 - (2*b^2*c^2*PolyLog[2, -1 + 2/(1 - I*c*x)])/d^2
- ((3*I)*b*c^2*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d^2 - (3
*b^2*c^2*PolyLog[3, -1 + 2/(1 + I*c*x)])/(2*d^2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
```

```
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3(d+icdx)^2}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x^3} - \frac{2ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2x^2} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} - \frac{ic^3\left(a+\right.}{d^2(}\right.$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx}{d^2} - \frac{(2ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx}{d^2} - \frac{\left(3c^2\right)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx}{d^2} - \left(ic^3\right)\int$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2x^2} + \frac{2ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} - \frac{ic^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2(i-cx)} - \frac{6c^2\left(a+b\right.}{}$$

$$= -\frac{2c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2x^2} + \frac{2ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} - \frac{ic^2\left(a+b\right.}{d^2(i}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{bc^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan\right.}{2d^2}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{bc^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan\right.}{2d^2}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{bc^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan\right.}{2d^2}$$

$$= \frac{ib^2c^2}{2d^2(i-cx)} - \frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{bc^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2c^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2}$$

$$= \frac{ib^2c^2}{2d^2(i-cx)} - \frac{ib^2c^2\tan^{-1}(cx)}{2d^2} - \frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{bc^2\left(a+b\tan^{-1}(cx)\right)}{d^2(i-cx)} - \frac{2c^2}{}$$

Mathematica [A] time = 3.14, size = 491, normalized size = 1.22

$$12a^2c^2\log\left(c^2x^2+1\right) + \frac{8ia^2c^2}{cx-i} - 24a^2c^2\log(x) + 24ia^2c^2\tan^{-1}(cx) + \frac{16ia^2c}{x} - \frac{4a^2}{x^2} + 4iabc^2\left(-8\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)+\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^3*(d + I*c*d*x)^2),x]
```

```
[Out] ((-4*a^2)/x^2 + ((16*I)*a^2*c)/x + ((8*I)*a^2*c^2)/(-I + c*x) + (24*I)*a^2*
c^2*ArcTan[c*x] - 24*a^2*c^2*Log[x] + 12*a^2*c^2*Log[1 + c^2*x^2] - b^2*c^2
*((-I)*Pi^3 + (8*ArcTan[c*x])/(c*x) + 20*ArcTan[c*x]^2 + (4*ArcTan[c*x]^2)/
(c^2*x^2) - ((16*I)*ArcTan[c*x]^2)/(c*x) - 2*Cos[2*ArcTan[c*x]] - (4*I)*Arc
Tan[c*x]*Cos[2*ArcTan[c*x]] + 4*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]] + 24*ArcTa
n[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] + (32*I)*ArcTan[c*x]*Log[1 - E^((2
*I)*ArcTan[c*x])] - 8*Log[(c*x)/Sqrt[1 + c^2*x^2]] + (24*I)*ArcTan[c*x]*Pol
yLog[2, E^((-2*I)*ArcTan[c*x])] + 16*PolyLog[2, E^((2*I)*ArcTan[c*x])] + 12
*PolyLog[3, E^((-2*I)*ArcTan[c*x])] + (2*I)*Sin[2*ArcTan[c*x]] - 4*ArcTan[c
*x]*Sin[2*ArcTan[c*x]] - (4*I)*ArcTan[c*x]^2*Sin[2*ArcTan[c*x]]) + (4*I)*a*
b*c^2*((2*I)/(c*x) + 12*ArcTan[c*x]^2 + Cos[2*ArcTan[c*x]] - 8*Log[(c*x)/Sq
rt[1 + c^2*x^2]] + 6*PolyLog[2, E^((2*I)*ArcTan[c*x])] - I*Sin[2*ArcTan[c*x
```

```
]] + 2*ArcTan[c*x]*(I + I/(c^2*x^2) + 4/(c*x) + I*Cos[2*ArcTan[c*x]] + (6*I
)*Log[1 - E^((2*I)*ArcTan[c*x])] + Sin[2*ArcTan[c*x]]])))/(8*d^2)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\log\left(-\frac{cx+i}{cx-i}\right)^2-4i\,ab\log\left(-\frac{cx+i}{cx-i}\right)-4\,a^2}{4\left(c^2d^2x^5-2i\,cd^2x^4-d^2x^3\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/4*(b^2*log(-(c*x + I)/(c*x - I))^2 - 4*I*a*b*log(-(c*x + I)/(c*x
 - I)) - 4*a^2)/(c^2*d^2*x^5 - 2*I*c*d^2*x^4 - d^2*x^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 7.14, size = 2378, normalized size = 5.90

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x)^2,x)
```

```
[Out] c^2*b^2/d^2*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)+3*I*c^2*b^2/d^2*Pi*csgn((1+I*
c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2*I*c^2*b
^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arcta
n(c*x)^2-3/2*I*c^2*b^2/d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-3/2*I*c^2*b^2/d^2*Pi*csgn(((1+I*c*x)^2/(
c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+3*I*c^2*a*b/d^2*
ln(c*x)*ln(1-I*c*x)-3*I*c^2*a*b/d^2*ln(c*x)*ln(1+I*c*x)+2*I*c^2*a*b/d^2*arc
tan(c*x)/(c*x-I)-3*I*c^2*a*b/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-a*b/d^2*arcta
n(c*x)/x^2-3*c^2*b^2/d^2*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+c^2*
b^2/d^2*arctan(c*x)/(2*c*x-2*I)-3*c^2*b^2/d^2*arctan(c*x)^2*ln(c*x)+3*c^2*b
^2/d^2*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)-3*c^2*b^2/d^2*arctan(c*x
)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-3*c^2*b^2/d^2*arctan(c*x)^2*ln(1-(1+I
*c*x)/(c^2*x^2+1)^(1/2))-1/4*c^3*b^2/d^2/(c*x-I)*x+I*c^2*a^2/d^2/(c*x-I)+c^
2*a*b/d^2/(c*x-I)+3*c^2*b^2/d^2*ln(c*x-I)*arctan(c*x)^2+2*I*c*a^2/d^2/x-1/4
*I*c^2*b^2/d^2/(c*x-I)+2*I*c^2*b^2/d^2*arctan(c*x)^3+3*I*c^2*a^2/d^2*arctan
(c*x)+3/2*I*c^2*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*
x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))
*arctan(c*x)^2-3/2*I*c^2*b^2/d^2*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*
x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2
+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))+c*b^2/d^2*arctan(c*x)/x*(c^2*x^2+1)^(1/
2)+I*c^2*b^2/d^2*arctan(c*x)^2/(c*x-I)-6*c^2*a*b/d^2*arctan(c*x)*ln(c*x)+6*
c^2*a*b/d^2*arctan(c*x)*ln(c*x-I)+3*I*c^2*a*b/d^2*dilog(1-I*c*x)+3/2*I*c^2*
a*b/d^2*ln(c*x-I)^2+2*I*c*b^2/d^2*arctan(c*x)^2/x-4*I*c^2*a*b/d^2*ln(c*x)-3
*I*c^2*a*b/d^2*dilog(-1/2*I*(I+c*x))-3*I*c^2*a*b/d^2*dilog(1+I*c*x)+6*I*c^2
*b^2/d^2*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+6*I*c^2*b^2/d^
2*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))-4*I*c^2*b^2/d^2*arctan
(c*x)*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*I*c^2*a*b/d^2*ln(c^2*x^2+1)-9/2*I
```

```
*c^2*b^2/d^2*Pi*arctan(c*x)^2-c*a*b/d^2/x+3/2*I*c^2*b^2/d^2*Pi*csgn(((1+I*c
*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+4*I*c*a*b
/d^2*arctan(c*x)/x-I*c^3*b^2/d^2*arctan(c*x)/(2*c*x-2*I)*x-1/2*b^2/d^2*arct
an(c*x)^2/x^2-2*c^2*b^2/d^2*arctan(c*x)^2-6*c^2*b^2/d^2*polylog(3,-(1+I*c*x
)/(c^2*x^2+1)^(1/2))-6*c^2*b^2/d^2*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))-3
*c^2*a^2/d^2*ln(c*x)+3/2*c^2*a^2/d^2*ln(c^2*x^2+1)+c^2*b^2/d^2*ln(1+(1+I*c*
x)/(c^2*x^2+1)^(1/2))+4*c^2*b^2/d^2*dilog((1+I*c*x)/(c^2*x^2+1)^(1/2))-4*c^
2*b^2/d^2*dilog(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-3/2*I*c^2*b^2/d^2*arctan(c*x
)^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^2+3/2*I*c^2*b^2/d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x
^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2
*arctan(c*x)^2+3/2*I*c^2*b^2/d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csg
n(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^
2+3/2*I*c^2*b^2/d^2*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*
x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-3/2*I*c^2*b^2/d^2*arcta
n(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))
*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))+3/2*I*c^2*b^
2/d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*cs
gn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2
-1/2*a^2/d^2/x^2
```

maxima [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(d+I*c*d*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\operatorname{atan}(c\,x))^2}{x^3\,(d+c\,d\,x\,1\mathrm{i})^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^3*(d + c*d*x*1i)^2),x)
[Out] int((a + b*atan(c*x))^2/(x^3*(d + c*d*x*1i)^2), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \frac{a^2}{c^2x^5-2icx^4-x^3}\,dx+\int \frac{b^2\operatorname{atan}^2(cx)}{c^2x^5-2icx^4-x^3}\,dx+\int \frac{2ab\operatorname{atan}(cx)}{c^2x^5-2icx^4-x^3}\,dx}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**3/(d+I*c*d*x)**2,x)
[Out] -(Integral(a**2/(c**2*x**5 - 2*I*c*x**4 - x**3), x) + Integral(b**2*atan(c*
x)**2/(c**2*x**5 - 2*I*c*x**4 - x**3), x) + Integral(2*a*b*atan(c*x)/(c**2*
x**5 - 2*I*c*x**4 - x**3), x))/d**2
```

3.111 $\int \frac{x^4\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx$

Optimal. Leaf size=462

$$-\frac{6b\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^5d^3}-\frac{15ib\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(-cx+i)}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(-cx+i)^2}+\frac{4\left(a+b\tan^{-1}(cx)\right)^2}{c^5d^3(-cx+i)}-\frac{i\left(a+b\text{t}\right.}{2c^5d^3(\cdot}$$

```
[Out] 1/2*I*b^2*ln(c^2*x^2+1)/c^5/d^3+3*I*b^2*polylog(3,1-2/(1+I*c*x))/c^5/d^3-29
/16*b^2/c^5/d^3/(I-c*x)+29/16*b^2*arctan(c*x)/c^5/d^3-3*I*b^2*polylog(2,1-2
/(1+I*c*x))/c^5/d^3-1/4*b*(a+b*arctan(c*x))/c^5/d^3/(I-c*x)^2+6*I*(a+b*arct
an(c*x))^2*ln(2/(1+I*c*x))/c^5/d^3-5/8*I*(a+b*arctan(c*x))^2/c^5/d^3-3*x*(a
+b*arctan(c*x))^2/c^4/d^3-15/4*I*b*(a+b*arctan(c*x))/c^5/d^3/(I-c*x)+1/2*I*
x^2*(a+b*arctan(c*x))^2/c^3/d^3+4*(a+b*arctan(c*x))^2/c^5/d^3/(I-c*x)-6*b*(
a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^5/d^3-I*a*b*x/c^4/d^3-1/2*I*(a+b*arctan(
c*x))^2/c^5/d^3/(I-c*x)^2-I*b^2*x*arctan(c*x)/c^4/d^3-6*b*(a+b*arctan(c*x))
*polylog(2,1-2/(1+I*c*x))/c^5/d^3+1/16*I*b^2/c^5/d^3/(I-c*x)^2
```

Rubi [A] time = 0.83, antiderivative size = 462, normalized size of antiderivative = 1.00, number of steps used = 37, number of rules used = 17, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.680, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 260, 4884, 4864, 4862, 627, 44, 203, 4994, 6610}

$$-\frac{6b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^5d^3}-\frac{3ib^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^5d^3}+\frac{3ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{c^5d^3}+\frac{ix^2\left(a+b\right.}{2\cdot}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] ((-I)*a*b*x)/(c^4*d^3) + ((I/16)*b^2)/(c^5*d^3*(I - c*x)^2) - (29*b^2)/(16*
c^5*d^3*(I - c*x)) + (29*b^2*ArcTan[c*x])/(16*c^5*d^3) - (I*b^2*x*ArcTan[c*
x])/(c^4*d^3) - (b*(a + b*ArcTan[c*x]))/(4*c^5*d^3*(I - c*x)^2) - (((15*I)/
4)*b*(a + b*ArcTan[c*x]))/(c^5*d^3*(I - c*x)) - (((5*I)/8)*(a + b*ArcTan[c*
x])^2)/(c^5*d^3) - (3*x*(a + b*ArcTan[c*x])^2)/(c^4*d^3) + ((I/2)*x^2*(a +
b*ArcTan[c*x])^2)/(c^3*d^3) - ((I/2)*(a + b*ArcTan[c*x])^2)/(c^5*d^3*(I - c
*x)^2) + (4*(a + b*ArcTan[c*x])^2)/(c^5*d^3*(I - c*x)) - (6*b*(a + b*ArcTan
[c*x])*Log[2/(1 + I*c*x)])/(c^5*d^3) + ((6*I)*(a + b*ArcTan[c*x])^2*Log[2/(
1 + I*c*x)])/(c^5*d^3) + ((I/2)*b^2*Log[1 + c^2*x^2])/(c^5*d^3) - ((3*I)*b^
2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^5*d^3) - (6*b*(a + b*ArcTan[c*x])*PolyL
og[2, 1 - 2/(1 + I*c*x)])/(c^5*d^3) + ((3*I)*b^2*PolyLog[3, 1 - 2/(1 + I*c*
x)])/(c^5*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^4\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx = \int\left(-\frac{3\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^3}+\frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^3(-i+cx)^3}+\frac{4\left(a\right.}{c^4}\right.$$

$$=\frac{i\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^3}dx}{c^4d^3}-\frac{(6i)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}dx}{c^4d^3}-\frac{3\int\left(a+b\tan^{-1}(cx)\right)^2dx}{c^4d^3}+\frac{4\int}{}$$

$$=-\frac{3x\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^3}+\frac{ix^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^3}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^5d^3(i-cx)^2}+\frac{4\left(a+\right.}{c^5}$$

$$=-\frac{3i\left(a+b\tan^{-1}(cx)\right)^2}{c^5d^3}-\frac{3x\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^3}+\frac{ix^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^3}-\frac{i\left(a+\right.}{2c^5}$$

$$=-\frac{iabx}{c^4d^3}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(i-cx)^2}-\frac{15ib\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(i-cx)}-\frac{5i\left(a+b\tan^{-1}(cx)\right)^2}{8c^5d^3}-$$

$$=-\frac{iabx}{c^4d^3}-\frac{ib^2x\tan^{-1}(cx)}{c^4d^3}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(i-cx)^2}-\frac{15ib\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(i-cx)}-\frac{5i\left(a+\right.}{}$$

$$=-\frac{iabx}{c^4d^3}-\frac{ib^2x\tan^{-1}(cx)}{c^4d^3}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(i-cx)^2}-\frac{15ib\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(i-cx)}-\frac{5i\left(a+\right.}{}$$

$$=-\frac{iabx}{c^4d^3}+\frac{ib^2}{16c^5d^3(i-cx)^2}-\frac{29b^2}{16c^5d^3(i-cx)}-\frac{ib^2x\tan^{-1}(cx)}{c^4d^3}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^5d^3(i-cx)^2}$$

$$=-\frac{iabx}{c^4d^3}+\frac{ib^2}{16c^5d^3(i-cx)^2}-\frac{29b^2}{16c^5d^3(i-cx)}+\frac{29b^2\tan^{-1}(cx)}{16c^5d^3}-\frac{ib^2x\tan^{-1}(cx)}{c^4d^3}-$$

Mathematica [A] time = 2.67, size = 578, normalized size = 1.25

$$8ia^2c^2x^2-48ia^2\log\left(c^2x^2+1\right)-48a^2cx-\frac{64a^2}{cx-i}-\frac{8ia^2}{(cx-i)^2}+96a^2\tan^{-1}(cx)+ab\left(48\log\left(c^2x^2+1\right)+4i\tan^{-1}(c\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] (-48*a^2*c*x + (8*I)*a^2*c^2*x^2 - ((8*I)*a^2)/(-I + c*x)^2 - (64*a^2)/(-I
+ c*x) + 96*a^2*ArcTan[c*x] - (48*I)*a^2*Log[1 + c^2*x^2] + a*b*((-16*I)*c*
x + 192*ArcTan[c*x]^2 - 28*Cos[2*ArcTan[c*x]] + Cos[4*ArcTan[c*x]] + 48*Log
[1 + c^2*x^2] + 96*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + (28*I)*Sin[2*ArcTan
[c*x]] + (4*I)*ArcTan[c*x]*(4 + (24*I)*c*x + 4*c^2*x^2 - 14*Cos[2*ArcTan[c*
x]] + Cos[4*ArcTan[c*x]] + 48*Log[1 + E^((2*I)*ArcTan[c*x])] + (14*I)*Sin[2
*ArcTan[c*x]] - I*Sin[4*ArcTan[c*x]]) - I*Sin[4*ArcTan[c*x]]) + (16*I)*b^2*
(-(c*x*ArcTan[c*x]) + 3*ArcTan[c*x]^2 + (3*I)*c*x*ArcTan[c*x]^2 + ((1 + c^2
*x^2)*ArcTan[c*x]^2)/2 - (4*I)*ArcTan[c*x]^3 - (7*(-1 - (2*I)*ArcTan[c*x] +
 2*ArcTan[c*x]^2)*Cos[2*ArcTan[c*x]])/8 - Cos[4*ArcTan[c*x]]/64 - (I/16)*Ar
cTan[c*x]*Cos[4*ArcTan[c*x]] + (ArcTan[c*x]^2*Cos[4*ArcTan[c*x]])/8 + (6*I)
*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 6*ArcTan[c*x]^2*Log[1 + E^((2
*I)*ArcTan[c*x])] + Log[1 + c^2*x^2]/2 + (3 - (6*I)*ArcTan[c*x])*PolyLog[2,
 -E^((2*I)*ArcTan[c*x])] + 3*PolyLog[3, -E^((2*I)*ArcTan[c*x])] - ((7*I)/8)
*Sin[2*ArcTan[c*x]] + (7*ArcTan[c*x]*Sin[2*ArcTan[c*x]])/4 + ((7*I)/4)*ArcT
an[c*x]^2*Sin[2*ArcTan[c*x]] + (I/64)*Sin[4*ArcTan[c*x]] - (ArcTan[c*x]*Sin
[4*ArcTan[c*x]])/16 - (I/8)*ArcTan[c*x]^2*Sin[4*ArcTan[c*x]]))/(16*c^5*d^3)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,b^2x^4\log\left(-\frac{cx+i}{cx-i}\right)^2-4\,abx^4\log\left(-\frac{cx+i}{cx-i}\right)+4i\,a^2x^4}{4\,c^3d^3x^3-12i\,c^2d^3x^2-12\,cd^3x+4i\,d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral((-I*b^2*x^4*log(-(c*x + I)/(c*x - I))^2 - 4*a*b*x^4*log(-(c*x + I)
/(c*x - I)) + 4*I*a^2*x^4)/(4*c^3*d^3*x^3 - 12*I*c^2*d^3*x^2 - 12*c*d^3*x +
 4*I*d^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 5.83, size = 1618, normalized size = 3.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x)
```

```
[Out] -I*a*b*x/c^4/d^3-I*b^2*x*arctan(c*x)/c^4/d^3+3/c^5*b^2/d^3*Pi*csgn((1+I*c*x
)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-8/c^5*a*b/d^3*
arctan(c*x)/(c*x-I)-6/c^5*a*b/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))+6/c^5*b^2/d^
3*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x
)^2+1/16/c^3*b^2/d^3*arctan(c*x)/(c*x-I)^2*x^2+7/4/c^4*b^2/d^3*arctan(c*x)/
(c*x-I)*x-6/c^4*a*b/d^3*arctan(c*x)*x-5/16*I/c^5*a*b/d^3*arctan(1/6*c^3*x^3
+7/6*c*x)+43/8*I/c^5*a*b/d^3*arctan(c*x)-5/8*I/c^5*a*b/d^3*arctan(1/2*c*x-1
/2*I)+1/2*I/c^3*b^2/d^3*arctan(c*x)^2*x^2-1/64*I/c^3*b^2/d^3/(c*x-I)^2*x^2-
7*I/c^4*b^2/d^3/(8*c*x-8*I)*x+7/4*I/c^5*b^2/d^3*arctan(c*x)/(c*x-I)+6*I/c^5
*b^2/d^3*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-6*I/c^5*b^2/d^3*arct
an(c*x)^2*ln(c*x-I)-1/2*I/c^5*b^2/d^3*arctan(c*x)^2/(c*x-I)^2+5/16*I/c^5*a*
b/d^3*arctan(1/2*c*x)+15/4*I/c^5*a*b/d^3/(c*x-I)-b^2*arctan(c*x)/c^5/d^3-3/
c^4*a^2/d^3*x+7/c^5*b^2/d^3/(8*c*x-8*I)+4/c^5*b^2/d^3*arctan(c*x)^3+6/c^5*a
^2/d^3*arctan(c*x)-4/c^5*a^2/d^3/(c*x-I)+I/c^3*a*b/d^3*arctan(c*x)*x^2+3/c^
5*b^2/d^3*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-3/c^5*b^2/d^3*Pi*csgn(I/((1+I*c*x
)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1
))^2*arctan(c*x)^2+1/8*I/c^4*b^2/d^3*arctan(c*x)/(c*x-I)^2*x-I/c^5*a*b/d^3*
arctan(c*x)/(c*x-I)^2-12*I/c^5*a*b/d^3*arctan(c*x)*ln(c*x-I)+3/c^5*b^2/d^3*
Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((
1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/c^5*a*b
/d^3+3/c^5*a*b/d^3*ln(c*x-I)^2-6/c^5*a*b/d^3*dilog(-1/2*I*(I+c*x))-6/c^5*b^
2/d^3*Pi*arctan(c*x)^2+1/32/c^4*b^2/d^3/(c*x-I)^2*x-3/c^4*b^2/d^3*arctan(c*
x)^2*x+1/64*I/c^5*b^2/d^3/(c*x-I)^2+43/8*I/c^5*b^2/d^3*arctan(c*x)^2-3*I/c^
5*a^2/d^3*ln(c^2*x^2+1)-1/2*I/c^5*a^2/d^3/(c*x-I)^2-I/c^5*b^2/d^3*ln((1+I*c
*x)^2/(c^2*x^2+1)+1)+6*I/c^5*b^2/d^3*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))
+6*I/c^5*b^2/d^3*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*I/c^5*b^2/d^3*pol
ylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+1/2*I/c^3*a^2/d^3*x^2-1/16/c^5*b^2/d^3*arc
tan(c*x)/(c*x-I)^2-6/c^5*b^2/d^3*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(
```

```
1/2))+6/c^5*b^2/d^3*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-4/c^5*b
^2/d^3*arctan(c*x)^2/(c*x-I)-6/c^5*b^2/d^3*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^
2*x^2+1)^(1/2))+5/32/c^5*a*b/d^3*ln(c^4*x^4+10*c^2*x^2+9)-1/4/c^5*a*b/d^3/(
c*x-I)^2+43/16/c^5*a*b/d^3*ln(c^2*x^2+1)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4 \left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3,x)
[Out] int((x^4*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*atan(c*x))**2/(d+I*c*d*x)**3,x)
[Out] Timed out
```

3.112 $\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx$

Optimal. Leaf size=383

$$\frac{3ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^3}-\frac{11b\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(-cx+i)}+\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(-cx+i)^2}-\frac{3i\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^3(-cx+i)}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^4d^3(-\right.}$$

```
[Out] 1/16*b^2/c^4/d^3/(I-c*x)^2+21/16*I*b^2/c^4/d^3/(I-c*x)-21/16*I*b^2*arctan(c
*x)/c^4/d^3+1/4*I*b*(a+b*arctan(c*x))/c^4/d^3/(I-c*x)^2-11/4*b*(a+b*arctan(
c*x))/c^4/d^3/(I-c*x)+3/8*(a+b*arctan(c*x))^2/c^4/d^3+I*x*(a+b*arctan(c*x))
^2/c^3/d^3-1/2*(a+b*arctan(c*x))^2/c^4/d^3/(I-c*x)^2-3*I*(a+b*arctan(c*x))^
2/c^4/d^3/(I-c*x)+2*I*b*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^4/d^3+3*(a+b*ar
ctan(c*x))^2*ln(2/(1+I*c*x))/c^4/d^3-b^2*polylog(2,1-2/(1+I*c*x))/c^4/d^3+3
*I*b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/c^4/d^3+3/2*b^2*polylog(3,1
-2/(1+I*c*x))/c^4/d^3
```

Rubi [A] time = 0.67, antiderivative size = 383, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 14, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.560, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4864, 4862, 627, 44, 203, 4884, 4994, 6610}

$$\frac{3ib\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^4d^3}-\frac{b^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c^4d^3}+\frac{3b^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2c^4d^3}-\frac{11b\left(a+b\tan\right.}{4c^4d^3(-cx}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] b^2/(16*c^4*d^3*(I - c*x)^2) + (((21*I)/16)*b^2)/(c^4*d^3*(I - c*x)) - (((2
1*I)/16)*b^2*ArcTan[c*x])/(c^4*d^3) + ((I/4)*b*(a + b*ArcTan[c*x]))/(c^4*d^
3*(I - c*x)^2) - (11*b*(a + b*ArcTan[c*x]))/(4*c^4*d^3*(I - c*x)) + (3*(a +
 b*ArcTan[c*x])^2)/(8*c^4*d^3) + (I*x*(a + b*ArcTan[c*x])^2)/(c^3*d^3) - (a
 + b*ArcTan[c*x])^2/(2*c^4*d^3*(I - c*x)^2) - ((3*I)*(a + b*ArcTan[c*x])^2)
/(c^4*d^3*(I - c*x)) + ((2*I)*b*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^
4*d^3) + (3*(a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c^4*d^3) - (b^2*Poly
Log[2, 1 - 2/(1 + I*c*x)])/(c^4*d^3) + ((3*I)*b*(a + b*ArcTan[c*x])*PolyLog
[2, 1 - 2/(1 + I*c*x)])/(c^4*d^3) + (3*b^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/(
2*c^4*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
```

```
rQ[m + p]))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx = \int\left(\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3(-i+cx)^3}-\frac{3i\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3(-i+cx)^2}-\frac{3\left(a+b\tan\right.}{c^3d^3(-i\right.}$$

$$=\frac{i\int\left(a+b\tan^{-1}(cx)\right)^2\,dx}{c^3d^3}-\frac{(3i)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}\,dx}{c^3d^3}+\frac{\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^3}\,dx}{c^3d^3}-\frac{3\int\frac{(a+b}{}}{}$$

$$=\frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^4d^3(i-cx)^2}-\frac{3i\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^3(i-cx)}+\frac{3\left(a+b\tan^{-1}\right.}{c}$$

$$=-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{c^4d^3}+\frac{ix\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^4d^3(i-cx)^2}-\frac{3i\left(a+b\tan^{-1}\right.}{c^4d^3(i-cx}$$

$$=\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)^2}-\frac{11b\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)}+\frac{3\left(a+b\tan^{-1}(cx)\right)^2}{8c^4d^3}+\frac{ix\left(a+b\tan\right.}{c^3d^3}$$

$$=\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)^2}-\frac{11b\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)}+\frac{3\left(a+b\tan^{-1}(cx)\right)^2}{8c^4d^3}+\frac{ix\left(a+b\tan\right.}{c^3d^3}$$

$$=\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)^2}-\frac{11b\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)}+\frac{3\left(a+b\tan^{-1}(cx)\right)^2}{8c^4d^3}+\frac{ix\left(a+b\tan\right.}{c^3d^3}$$

$$=\frac{b^2}{16c^4d^3(i-cx)^2}+\frac{21ib^2}{16c^4d^3(i-cx)}+\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)^2}-\frac{11b\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)}+$$

$$=\frac{b^2}{16c^4d^3(i-cx)^2}+\frac{21ib^2}{16c^4d^3(i-cx)}-\frac{21ib^2\tan^{-1}(cx)}{16c^4d^3}+\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^4d^3(i-cx)^2}-\frac{11b\left(a\right.}{4c}$$

Mathematica [A] time = 1.66, size = 507, normalized size = 1.32

$$\frac{-96a^2\log\left(c^2x^2+1\right)+64ia^2cx+\frac{192ia^2}{cx-i}-\frac{32a^2}{(cx-i)^2}-192ia^2\tan^{-1}(cx)+4iab\left(-16\log\left(c^2x^2+1\right)-48\text{Li}_2\left(-e^{2i\tan^{-1}(}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] ((64*I)*a^2*c*x - (32*a^2)/(-I + c*x)^2 + ((192*I)*a^2)/(-I + c*x) - (192*I
)*a^2*ArcTan[c*x] - 96*a^2*Log[1 + c^2*x^2] + (4*I)*a*b*(-96*ArcTan[c*x]^2
+ 20*Cos[2*ArcTan[c*x]] - Cos[4*ArcTan[c*x]] - 16*Log[1 + c^2*x^2] - 48*Pol
yLog[2, -E^((2*I)*ArcTan[c*x])] - (20*I)*Sin[2*ArcTan[c*x]] + 4*ArcTan[c*x]
*(8*c*x + (10*I)*Cos[2*ArcTan[c*x]] - I*Cos[4*ArcTan[c*x]] - (24*I)*Log[1 +
 E^((2*I)*ArcTan[c*x])] + 10*Sin[2*ArcTan[c*x]] - Sin[4*ArcTan[c*x]]) + I*S
in[4*ArcTan[c*x]]) + I*b^2*((-64*I)*ArcTan[c*x]^2 + 64*c*x*ArcTan[c*x]^2 -
128*ArcTan[c*x]^3 - (40*I)*Cos[2*ArcTan[c*x]] + 80*ArcTan[c*x]*Cos[2*ArcTan
[c*x]] + (80*I)*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]] + I*Cos[4*ArcTan[c*x]] - 4
*ArcTan[c*x]*Cos[4*ArcTan[c*x]] - (8*I)*ArcTan[c*x]^2*Cos[4*ArcTan[c*x]] +
128*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - (192*I)*ArcTan[c*x]^2*Log[
1 + E^((2*I)*ArcTan[c*x])] - 64*(I + 3*ArcTan[c*x])*PolyLog[2, -E^((2*I)*Ar
cTan[c*x])] - (96*I)*PolyLog[3, -E^((2*I)*ArcTan[c*x])] - 40*Sin[2*ArcTan[c
*x]] - (80*I)*ArcTan[c*x]*Sin[2*ArcTan[c*x]] + 80*ArcTan[c*x]^2*Sin[2*ArcTa
n[c*x]] + Sin[4*ArcTan[c*x]] + (4*I)*ArcTan[c*x]*Sin[4*ArcTan[c*x]] - 8*Arc
Tan[c*x]^2*Sin[4*ArcTan[c*x]]))/(64*c^4*d^3)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{-i\,b^2x^3\log\left(-\frac{cx+i}{cx-i}\right)^2-4\,abx^3\log\left(-\frac{cx+i}{cx-i}\right)+4i\,a^2x^3}{4\,c^3d^3x^3-12i\,c^2d^3x^2-12\,cd^3x+4i\,d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral((-I*b^2*x^3*log(-(c*x + I)/(c*x - I))^2 - 4*a*b*x^3*log(-(c*x + I)
/(c*x - I)) + 4*I*a^2*x^3)/(4*c^3*d^3*x^3 - 12*I*c^2*d^3*x^2 - 12*c*d^3*x +
 4*I*d^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.93, size = 5012, normalized size = 13.09

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2}{{\left(d+c\,d\,x\,1{}\mathrm{i}\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3,x)
[Out] int((x^3*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))**2/(d+I*c*d*x)**3,x)
[Out] Timed out
```

3.113 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx$

Optimal. Leaf size=304

$$\frac{b\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^3}+\frac{7ib\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(-cx+i)}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(-cx+i)^2}-\frac{2\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3(-cx+i)}+\frac{i\left(a+b\tan^{-1}(cx)\right)}{2c^3d^3(-\cdots}$$

```
[Out] -1/16*I*b^2/c^3/d^3/(I-c*x)^2+13/16*b^2/c^3/d^3/(I-c*x)-13/16*b^2*arctan(c*
x)/c^3/d^3+1/4*b*(a+b*arctan(c*x))/c^3/d^3/(I-c*x)^2+7/4*I*b*(a+b*arctan(c*
x))/c^3/d^3/(I-c*x)-7/8*I*(a+b*arctan(c*x))^2/c^3/d^3+1/2*I*(a+b*arctan(c*x
))^2/c^3/d^3/(I-c*x)^2-2*(a+b*arctan(c*x))^2/c^3/d^3/(I-c*x)-I*(a+b*arctan(
c*x))^2*ln(2/(1+I*c*x))/c^3/d^3+b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x)
)/c^3/d^3-1/2*I*b^2*polylog(3,1-2/(1+I*c*x))/c^3/d^3
```

Rubi [A] time = 0.56, antiderivative size = 304, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 10, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}} = 0.400$, Rules used = {4876, 4864, 4862, 627, 44, 203, 4884, 4854, 4994, 6610}

$$\frac{b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d^3}-\frac{ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)}{2c^3d^3}+\frac{7ib\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(-cx+i)}+\frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(-cx+i)^2}\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] ((-I/16)*b^2)/(c^3*d^3*(I - c*x)^2) + (13*b^2)/(16*c^3*d^3*(I - c*x)) - (13
*b^2*ArcTan[c*x])/(16*c^3*d^3) + (b*(a + b*ArcTan[c*x]))/(4*c^3*d^3*(I - c*
x)^2) + (((7*I)/4)*b*(a + b*ArcTan[c*x]))/(c^3*d^3*(I - c*x)) - (((7*I)/8)*
(a + b*ArcTan[c*x])^2)/(c^3*d^3) + ((I/2)*(a + b*ArcTan[c*x])^2)/(c^3*d^3*(
I - c*x)^2) - (2*(a + b*ArcTan[c*x])^2)/(c^3*d^3*(I - c*x)) - (I*(a + b*Arc
Tan[c*x])^2*Log[2/(1 + I*c*x)])/(c^3*d^3) + (b*(a + b*ArcTan[c*x])*PolyLog[
2, 1 - 2/(1 + I*c*x)])/(c^3*d^3) - ((I/2)*b^2*PolyLog[3, 1 - 2/(1 + I*c*x)]
)/(c^3*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
```

```
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^2 \left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx = \int \left(-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^3(-i+cx)^3} - \frac{2\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^3(-i+cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{c^2d^3(-i+cx)}\right)dx$$

$$= -\frac{i\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^3}dx}{c^2d^3} + \frac{i\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{-i+cx}dx}{c^2d^3} - \frac{2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}dx}{c^2d^3}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^3(i-cx)^2} - \frac{2\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^3d^3} - \cdots$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d^3(i-cx)^2} - \frac{2\left(a+b\tan^{-1}(cx)\right)^2}{c^3d^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^3d^3} + \cdots$$

$$= \frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)^2} + \frac{7ib\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)} - \frac{7i\left(a+b\tan^{-1}(cx)\right)^2}{8c^3d^3} + \frac{i\left(a+b\tan \cdots\right.}{2c^3d^3(i \cdots}$$

$$= \frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)^2} + \frac{7ib\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)} - \frac{7i\left(a+b\tan^{-1}(cx)\right)^2}{8c^3d^3} + \frac{i\left(a+b\tan \cdots\right.}{2c^3d^3(i \cdots}$$

$$= \frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)^2} + \frac{7ib\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)} - \frac{7i\left(a+b\tan^{-1}(cx)\right)^2}{8c^3d^3} + \frac{i\left(a+b\tan \cdots\right.}{2c^3d^3(i \cdots}$$

$$= -\frac{ib^2}{16c^3d^3(i-cx)^2} + \frac{13b^2}{16c^3d^3(i-cx)} + \frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)^2} + \frac{7ib\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)} \cdots$$

$$= -\frac{ib^2}{16c^3d^3(i-cx)^2} + \frac{13b^2}{16c^3d^3(i-cx)} - \frac{13b^2\tan^{-1}(cx)}{16c^3d^3} + \frac{b\left(a+b\tan^{-1}(cx)\right)}{4c^3d^3(i-cx)^2} + \frac{7ib \cdots}{\cdots}$$

Mathematica [A] time = 1.26, size = 431, normalized size = 1.42

$$\frac{96ia^2\log\left(c^2x^2+1\right) + \frac{384a^2}{cx-i} + \frac{96ia^2}{(cx-i)^2} - 192a^2\tan^{-1}(cx) - 12ab\left(16\text{Li}_2\left(-e^{2i\tan^{-1}(cx)}\right) + 32\tan^{-1}(cx)^2 + 12i\sin\left(\cdots\right.\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] (((96*I)*a^2)/(-I + c*x)^2 + (384*a^2)/(-I + c*x) - 192*a^2*ArcTan[c*x] + (
96*I)*a^2*Log[1 + c^2*x^2] - b^2*(128*ArcTan[c*x]^3 + (72*I)*Cos[2*ArcTan[c
*x]] - 144*ArcTan[c*x]*Cos[2*ArcTan[c*x]] - (144*I)*ArcTan[c*x]^2*Cos[2*Arc
Tan[c*x]] - (3*I)*Cos[4*ArcTan[c*x]] + 12*ArcTan[c*x]*Cos[4*ArcTan[c*x]] +
(24*I)*ArcTan[c*x]^2*Cos[4*ArcTan[c*x]] + (192*I)*ArcTan[c*x]^2*Log[1 + E^(
(2*I)*ArcTan[c*x])] + 192*ArcTan[c*x]*PolyLog[2, -E^((2*I)*ArcTan[c*x])] +
(96*I)*PolyLog[3, -E^((2*I)*ArcTan[c*x])] + 72*Sin[2*ArcTan[c*x]] + (144*I)
*ArcTan[c*x]*Sin[2*ArcTan[c*x]] - 144*ArcTan[c*x]^2*Sin[2*ArcTan[c*x]] - 3*
Sin[4*ArcTan[c*x]] - (12*I)*ArcTan[c*x]*Sin[4*ArcTan[c*x]] + 24*ArcTan[c*x]
^2*Sin[4*ArcTan[c*x]]) - 12*a*b*(32*ArcTan[c*x]^2 - 12*Cos[2*ArcTan[c*x]] +
 Cos[4*ArcTan[c*x]] + 16*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + (12*I)*Sin[2*
ArcTan[c*x]] - I*Sin[4*ArcTan[c*x]] + 4*ArcTan[c*x]*((-6*I)*Cos[2*ArcTan[c*
x]] + I*Cos[4*ArcTan[c*x]] + (8*I)*Log[1 + E^((2*I)*ArcTan[c*x])] - 6*Sin[2
*ArcTan[c*x]] + Sin[4*ArcTan[c*x]])))/(192*c^3*d^3)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{-i\,b^2x^2\log\left(-\frac{cx+i}{cx-i}\right)^2 - 4\,abx^2\log\left(-\frac{cx+i}{cx-i}\right) + 4i\,a^2x^2}{4\,c^3d^3x^3 - 12i\,c^2d^3x^2 - 12\,cd^3x + 4i\,d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral((-I*b^2*x^2*log(-(c*x + I)/(c*x - I))^2 - 4*a*b*x^2*log(-(c*x + I)
/(c*x - I)) + 4*I*a^2*x^2)/(4*c^3*d^3*x^3 - 12*I*c^2*d^3*x^2 - 12*c*d^3*x +
 4*I*d^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.47, size = 1276, normalized size = 4.20

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x)
```

```
[Out] -3/4*I/c^3*b^2/d^3*arctan(c*x)/(c*x-I)+1/2*I/c^3*b^2/d^3*arctan(c*x)^2/(c*x
-I)^2-7/16*I/c^3*a*b/d^3*arctan(1/6*c^3*x^3+7/6*c*x)+7/16*I/c^3*a*b/d^3*arc
tan(1/2*c*x)-7/8*I/c^3*a*b/d^3*arctan(1/2*c*x-1/2*I)-7/4*I/c^3*a*b/d^3/(c*x
-I)-7/8*I/c^3*a*b/d^3*arctan(c*x)+1/64*I/c*b^2/d^3/(c*x-I)^2*x^2-1/32/c^2*b
^2/d^3/(c*x-I)^2*x-3/c^3*b^2/d^3/(8*c*x-8*I)-2/3/c^3*b^2/d^3*arctan(c*x)^3-
1/c^3*a^2/d^3*arctan(c*x)+2/c^3*a^2/d^3/(c*x-I)-1/c^3*b^2/d^3*arctan(c*x)*p
olylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+2/c^3*b^2/d^3*arctan(c*x)^2/(c*x-I)-7/16
/c^3*a*b/d^3*ln(c^2*x^2+1)-1/2/c^3*a*b/d^3*ln(c*x-I)^2+1/c^3*a*b/d^3*dilog(
-1/2*I*(I+c*x))+1/16/c^3*b^2/d^3*arctan(c*x)/(c*x-I)^2+1/c^3*b^2/d^3*Pi*arc
tan(c*x)^2+7/32/c^3*a*b/d^3*ln(c^4*x^4+10*c^2*x^2+9)+1/4/c^3*a*b/d^3/(c*x-I
)^2-7/8*I/c^3*b^2/d^3*arctan(c*x)^2+1/2*I/c^3*a^2/d^3/(c*x-I)^2+1/2*I/c^3*a
^2/d^3*ln(c^2*x^2+1)-1/64*I/c^3*b^2/d^3/(c*x-I)^2-1/2*I/c^3*b^2/d^3*polylog
(3,-(1+I*c*x)^2/(c^2*x^2+1))+I/c^3*a*b/d^3*arctan(c*x)/(c*x-I)^2-1/2/c^3*b^
2/d^3*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c
*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2/c^3*b^2/d^3*Pi*csgn(I/((1+I*c*x)^
2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))
^2*arctan(c*x)^2-1/8*I/c^2*b^2/d^3*arctan(c*x)/(c*x-I)^2*x+2*I/c^3*a*b/d^3*
arctan(c*x)*ln(c*x-I)+4/c^3*a*b/d^3*arctan(c*x)/(c*x-I)+1/c^3*a*b/d^3*ln(c*
x-I)*ln(-1/2*I*(I+c*x))+I/c^3*b^2/d^3*arctan(c*x)^2*ln(c*x-I)-1/16/c*b^2/d^
3*arctan(c*x)/(c*x-I)^2*x^2-3/4/c^2*b^2/d^3*arctan(c*x)/(c*x-I)*x-1/2/c^3*b
^2/d^3*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arcta
n(c*x)^2-1/c^3*b^2/d^3*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^
2+1)+1))^2*arctan(c*x)^2+3*I/c^2*b^2/d^3/(8*c*x-8*I)*x-I/c^3*b^2/d^3*arctan
(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-1/2/c^3*b^2/d^3*Pi*csgn(I/((1+I*c*x
)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2
+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2 (a + b \operatorname{atan}(c x))^2}{(d + c d x 1i)^3} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3,x)
```

```
[Out] int((x^2*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))**2/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.114 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx$

Optimal. Leaf size=178

$$\frac{3b\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(-cx+i)}-\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(-cx+i)^2}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{8c^2d^3}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(1+icx)^2}-\frac{5ib^2}{16c^2d^3(-cx+i)}-\frac{b^2}{16c^2d^3(-\cdots}$$

```
[Out] -1/16*b^2/c^2/d^3/(I-c*x)^2-5/16*I*b^2/c^2/d^3/(I-c*x)+5/16*I*b^2*arctan(c*
x)/c^2/d^3-1/4*I*b*(a+b*arctan(c*x))/c^2/d^3/(I-c*x)^2+3/4*b*(a+b*arctan(c*
x))/c^2/d^3/(I-c*x)+1/8*(a+b*arctan(c*x))^2/c^2/d^3+1/2*x^2*(a+b*arctan(c*x
))^2/d^3/(1+I*c*x)^2
```

Rubi [A] time = 0.22, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.304$, Rules used = {37, 4874, 4862, 627, 44, 203, 4884}

$$\frac{3b\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(-cx+i)}-\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(-cx+i)^2}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{8c^2d^3}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(1+icx)^2}-\frac{5ib^2}{16c^2d^3(-cx+i)}-\frac{b^2}{16c^2d^3(-\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] -b^2/(16*c^2*d^3*(I - c*x)^2) - (((5*I)/16)*b^2)/(c^2*d^3*(I - c*x)) + (((5
*I)/16)*b^2*ArcTan[c*x])/(c^2*d^3) - ((I/4)*b*(a + b*ArcTan[c*x]))/(c^2*d^3
*(I - c*x)^2) + (3*b*(a + b*ArcTan[c*x]))/(4*c^2*d^3*(I - c*x)) + (a + b*Ar
cTan[c*x])^2/(8*c^2*d^3) + (x^2*(a + b*ArcTan[c*x])^2)/(2*d^3*(1 + I*c*x)^2
)
```

Rule 37

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp
[((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] /; FreeQ[{
a, b, c, d, m, n}, x] && NeQ[b*c - a*d, 0] && EqQ[m + n + 2, 0] && NeQ[m, -
1]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4874

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_.) + (e_
.)*(x_))^(q_), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x)^q, x]}, Dis
t[(a + b*ArcTan[c*x])^p, u, x] - Dist[b*c*p, Int[ExpandIntegrand[(a + b*Arc
Tan[c*x])^(p - 1), u/(1 + c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f,
 q}, x] && IGtQ[p, 1] && EqQ[c^2*d^2 + e^2, 0] && IntegersQ[m, q] && NeQ[m,
 -1] && NeQ[q, -1] && ILtQ[m + q + 1, 0] && LtQ[m*q, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx = \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(1+icx)^2} - (2bc)\int\left(-\frac{i\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(-i+cx)^3} - \frac{3\left(a+b\tan^{-1}(cx)\right)}{8c^2d^3(-i+cx)^2} - \frac{a}{8c$$

$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(1+icx)^2} + \frac{(ib)\int\frac{a+b\tan^{-1}(cx)}{(-i+cx)^3}\,dx}{2cd^3} + \frac{b\int\frac{a+b\tan^{-1}(cx)}{1+c^2x^2}\,dx}{4cd^3} + \frac{(3b)\int\frac{a+b\tan}{(-i+}}{4cd^3}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)^2} + \frac{3b\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{8c^2d^3} + \frac{x^2\left(a+b\tan}{2d^3(1+}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)^2} + \frac{3b\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{8c^2d^3} + \frac{x^2\left(a+b\tan}{2d^3(1+}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)^2} + \frac{3b\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{8c^2d^3} + \frac{x^2\left(a+b\tan}{2d^3(1+}$$

$$= -\frac{b^2}{16c^2d^3(i-cx)^2} - \frac{5ib^2}{16c^2d^3(i-cx)} - \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)^2} + \frac{3b\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)} -$$

$$= -\frac{b^2}{16c^2d^3(i-cx)^2} - \frac{5ib^2}{16c^2d^3(i-cx)} + \frac{5ib^2\tan^{-1}(cx)}{16c^2d^3} - \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4c^2d^3(i-cx)^2} + \frac{3b(}{4}$$

Mathematica [A] time = 0.39, size = 117, normalized size = 0.66

$$\frac{a^2(-8-16icx)+4ab(-3cx+2i)+b(cx+i)\tan^{-1}(cx)(a(-12cx+4i)+b(3+5icx))-2b^2\left(3c^2x^2+2icx+1\right)\tan}{16c^2d^3(cx-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x])^2)/(d + I*c*d*x)^3,x]
```

```
[Out] (4*a*b*(2*I - 3*c*x) + b^2*(4 + (5*I)*c*x) + a^2*(-8 - (16*I)*c*x) + b*(I +
 c*x)*(a*(4*I - 12*c*x) + b*(3 + (5*I)*c*x))*ArcTan[c*x] - 2*b^2*(1 + (2*I)
*c*x + 3*c^2*x^2)*ArcTan[c*x]^2)/(16*c^2*d^3*(-I + c*x)^2)
```

fricas [A] time = 1.42, size = 161, normalized size = 0.90

$$\frac{\left(-32i\,a^2-24\,ab+10i\,b^2\right)cx+\left(3\,b^2c^2x^2+2i\,b^2cx+b^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2-16\,a^2+16i\,ab+8\,b^2+\left(\left(-12i\,ab-5\,b^2\right)c^2\right.}{32\left(c^4d^3x^2-2i\,c^3d^3x-c^2d^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] 1/32*((-32*I*a^2 - 24*a*b + 10*I*b^2)*c*x + (3*b^2*c^2*x^2 + 2*I*b^2*c*x +
b^2)*log(-(c*x + I)/(c*x - I))^2 - 16*a^2 + 16*I*a*b + 8*b^2 + ((-12*I*a*b
- 5*b^2)*c^2*x^2 + (8*a*b - 2*I*b^2)*c*x - 4*I*a*b - 3*b^2)*log(-(c*x + I)/
(c*x - I)))/(c^4*d^3*x^2 - 2*I*c^3*d^3*x - c^2*d^3)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.10, size = 464, normalized size = 2.61

$$-\frac{ia^2}{c^2d^3\,(cx-i)}+\frac{a^2}{2c^2d^3\,(cx-i)^2}-\frac{ib^2\arctan\,(cx)^2}{c^2d^3\,(cx-i)}+\frac{b^2\arctan\,(cx)^2}{2c^2d^3\,(cx-i)^2}-\frac{3ib^2\arctan\,(cx)\ln\,(cx+i)}{8c^2d^3}+\frac{3ib^2\arctan\,(cx)\ln}{8c^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x)
```

```
[Out] -I/c^2*a^2/d^3/(c*x-I)+1/2/c^2*a^2/d^3/(c*x-I)^2-I/c^2*b^2/d^3*arctan(c*x)^
2/(c*x-I)+1/2/c^2*b^2/d^3*arctan(c*x)^2/(c*x-I)^2-3/8*I/c^2*b^2/d^3*arctan(
c*x)*ln(I+c*x)+3/8*I/c^2*b^2/d^3*arctan(c*x)*ln(c*x-I)-1/4*I/c^2*b^2/d^3*ar
ctan(c*x)/(c*x-I)^2-3/4/c^2*b^2/d^3*arctan(c*x)/(c*x-I)-1/4*I/c^2*a*b/d^3/(
c*x-I)^2+5/16*I/c^2*b^2/d^3/(c*x-I)-1/16/c^2*b^2/d^3/(c*x-I)^2-3/16/c^2*b^2
/d^3*ln(-1/2*I*(-c*x+I))*ln(-1/2*I*(I+c*x))+3/16/c^2*b^2/d^3*ln(-1/2*I*(-c*
x+I))*ln(I+c*x)-3/32/c^2*b^2/d^3*ln(I+c*x)^2+3/16/c^2*b^2/d^3*ln(c*x-I)*ln(
-1/2*I*(I+c*x))-3/32/c^2*b^2/d^3*ln(c*x-I)^2+5/16*I*b^2*arctan(c*x)/c^2/d^3
+1/c^2*a*b/d^3*arctan(c*x)/(c*x-I)^2-3/4/c^2*a*b/d^3*arctan(c*x)-2*I/c^2*a*
b/d^3*arctan(c*x)/(c*x-I)-3/4/c^2*a*b/d^3/(c*x-I)
```

maxima [A] time = 0.48, size = 142, normalized size = 0.80

$$-\frac{\left(16i\,a^2+12\,ab-5i\,b^2\right)cx+\left(6\,b^2c^2x^2+4i\,b^2cx+2\,b^2\right)\arctan\,(cx)^2+8\,a^2-8i\,ab-4\,b^2+\left(\left(12\,ab-5i\,b^2\right)c^2x^2+\right.}{16\,c^4d^3x^2-32i\,c^3d^3x-16\,c^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -((16*I*a^2 + 12*a*b - 5*I*b^2)*c*x + (6*b^2*c^2*x^2 + 4*I*b^2*c*x + 2*b^2)
*arctan(c*x)^2 + 8*a^2 - 8*I*a*b - 4*b^2 + ((12*a*b - 5*I*b^2)*c^2*x^2 + (8
*I*a*b + 2*b^2)*c*x + 4*a*b - 3*I*b^2)*arctan(c*x))/(16*c^4*d^3*x^2 - 32*I*
c^3*d^3*x - 16*c^2*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(c\,x))^2}{(d+c\,d\,x\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3,x)
```

```
[Out] int((x*(a + b*atan(c*x))^2)/(d + c*d*x*1i)^3, x)
```

sympy [B] time = 84.07, size = 502, normalized size = 2.82

$$-\frac{ib\left(12a-5ib\right)\log\left(-\frac{b(12a-5ib)}{c}+x\left(12iab+5b^2\right)\right)}{32c^2d^3}+\frac{ib\left(12a-5ib\right)\log\left(\frac{b(12a-5ib)}{c}+x\left(12iab+5b^2\right)\right)}{32c^2d^3}+\frac{\left(-3b^2c^2x^2\right.}{-32c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))**2/(d+I*c*d*x)**3,x)
```

```
[Out] -I*b*(12*a - 5*I*b)*log(-b*(12*a - 5*I*b)/c + x*(12*I*a*b + 5*b**2))/(32*c*
*2*d**3) + I*b*(12*a - 5*I*b)*log(b*(12*a - 5*I*b)/c + x*(12*I*a*b + 5*b**2
))/(32*c**2*d**3) + (-3*b**2*c**2*x**2 - 2*I*b**2*c*x - b**2)*log(-I*c*x +
1)**2/(-32*c**4*d**3*x**2 + 64*I*c**3*d**3*x + 32*c**2*d**3) + (-3*b**2*c**
2*x**2 - 2*I*b**2*c*x - b**2)*log(I*c*x + 1)**2/(-32*c**4*d**3*x**2 + 64*I*
c**3*d**3*x + 32*c**2*d**3) + (-8*a*b*c*x + 4*I*a*b + 3*I*b**2*c*x + 2*b**2
)*log(I*c*x + 1)/(8*c**4*d**3*x**2 - 16*I*c**3*d**3*x - 8*c**2*d**3) - (-8*
a**2 + 8*I*a*b + 4*b**2 + x*(-16*I*a**2*c - 12*a*b*c + 5*I*b**2*c))/(-16*c*
*4*d**3*x**2 + 32*I*c**3*d**3*x + 16*c**2*d**3) + (-16*a*b*c*x + 8*I*a*b +
3*b**2*c**2*x**2*log(I*c*x + 1) + 2*I*b**2*c*x*log(I*c*x + 1) + 6*I*b**2*c*
x + b**2*log(I*c*x + 1) + 4*b**2)*log(-I*c*x + 1)/(-16*c**4*d**3*x**2 + 32*
I*c**3*d**3*x + 16*c**2*d**3)
```

3.115 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx$

Optimal. Leaf size=180

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4cd^3(-cx+i)}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{4cd^3(-cx+i)^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^3(1+icx)^2}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3}+\frac{3b^2}{16cd^3(-cx+i)}+\frac{ib^2}{16cd^3(-cx}$$

```
[Out] 1/16*I*b^2/c/d^3/(I-c*x)^2+3/16*b^2/c/d^3/(I-c*x)-3/16*b^2*arctan(c*x)/c/d^
3-1/4*b*(a+b*arctan(c*x))/c/d^3/(I-c*x)^2+1/4*I*b*(a+b*arctan(c*x))/c/d^3/(
I-c*x)-1/8*I*(a+b*arctan(c*x))^2/c/d^3+1/2*I*(a+b*arctan(c*x))^2/c/d^3/(1+I
*c*x)^2
```

Rubi [A] time = 0.18, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4864, 4862, 627, 44, 203, 4884}

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4cd^3(-cx+i)}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{4cd^3(-cx+i)^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^3(1+icx)^2}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3}+\frac{3b^2}{16cd^3(-cx+i)}+\frac{ib^2}{16cd^3(-cx}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(d + I*c*d*x)^3,x]
```

```
[Out] ((I/16)*b^2)/(c*d^3*(I - c*x)^2) + (3*b^2)/(16*c*d^3*(I - c*x)) - (3*b^2*Ar
cTan[c*x])/(16*c*d^3) - (b*(a + b*ArcTan[c*x]))/(4*c*d^3*(I - c*x)^2) + ((I
/4)*b*(a + b*ArcTan[c*x]))/(c*d^3*(I - c*x)) - ((I/8)*(a + b*ArcTan[c*x])^2
)/(c*d^3) + ((I/2)*(a + b*ArcTan[c*x])^2)/(c*d^3*(1 + I*c*x)^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
```

```
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(d+icdx)^3}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^3(1+icx)^2} - \frac{(ib)\int \left(\frac{i\left(a+b\tan^{-1}(cx)\right)}{2d^2(-i+cx)^3} - \frac{a+b\tan^{-1}(cx)}{4d^2(-i+cx)^2} + \frac{a+b\tan^{-1}(cx)}{4d^2\left(1+c^2x^2\right)}\right)dx}{d}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2cd^3(1+icx)^2} + \frac{(ib)\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx}{4d^3} - \frac{(ib)\int \frac{a+b\tan^{-1}(cx)}{1+c^2x^2}\,dx}{4d^3} + \frac{b\int \frac{a+b\tan^{-1}(cx}{(-i+cx)^3}}{2d^3}$$

$$= -\frac{b\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3} + \frac{i\left(a+b\tan^{-1}(\right.}{2cd^3(1+ic}$$

$$= -\frac{b\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3} + \frac{i\left(a+b\tan^{-1}(\right.}{2cd^3(1+ic}$$

$$= -\frac{b\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3} + \frac{i\left(a+b\tan^{-1}(\right.}{2cd^3(1+ic}$$

$$= \frac{ib^2}{16cd^3(i-cx)^2} + \frac{3b^2}{16cd^3(i-cx)} - \frac{b\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)} - \frac{i(a-}{}$$

$$= \frac{ib^2}{16cd^3(i-cx)^2} + \frac{3b^2}{16cd^3(i-cx)} - \frac{3b^2\tan^{-1}(cx)}{16cd^3} - \frac{b\left(a+b\tan^{-1}(cx)\right)}{4cd^3(i-cx)^2} + \frac{ib\left(a+b\,\mathrm{ta}\right.}{4cd^3(i}$$

Mathematica [A] time = 0.19, size = 110, normalized size = 0.61

$$-\frac{i\left(8a^2+4ab(cx-2i)+b(cx+i)\tan^{-1}(cx)(4a(cx-3i)+b(-5-3icx))+2b^2\left(c^2x^2-2icx+3\right)\tan^{-1}(cx)^2+b\right.}{16cd^3(cx-i)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(d + I*c*d*x)^3,x]
```

```
[Out] ((-1/16*I)*(8*a^2 + b^2*(-4 - (3*I)*c*x) + 4*a*b*(-2*I + c*x) + b*(I + c*x)
*(b*(-5 - (3*I)*c*x) + 4*a*(-3*I + c*x))*ArcTan[c*x] + 2*b^2*(3 - (2*I)*c*x
 + c^2*x^2)*ArcTan[c*x]^2))/(c*d^3*(-I + c*x)^2)
```

fricas [A] time = 0.62, size = 158, normalized size = 0.88

$$-\frac{2\left(4i\,ab+3\,b^2\right)cx-\left(i\,b^2c^2x^2+2\,b^2cx+3i\,b^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+16i\,a^2+16\,ab-8i\,b^2-\left(\left(4\,ab-3i\,b^2\right)c^2x^2-2\right(}{32\left(c^3d^3x^2-2i\,c^2d^3x-cd^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] -1/32*(2*(4*I*a*b + 3*b^2)*c*x - (I*b^2*c^2*x^2 + 2*b^2*c*x + 3*I*b^2)*log(
-(c*x + I)/(c*x - I))^2 + 16*I*a^2 + 16*a*b - 8*I*b^2 - ((4*a*b - 3*I*b^2)*
c^2*x^2 - 2*(4*I*a*b + b^2)*c*x + 12*a*b - 5*I*b^2)*log(-(c*x + I)/(c*x - I
)))/(c^3*d^3*x^2 - 2*I*c^2*d^3*x - c*d^3)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.07, size = 405, normalized size = 2.25

$$-\frac{ib^2\ln\left(-\frac{i(-cx+i)}{2}\right)\ln\left(-\frac{i(cx+i)}{2}\right)}{16c\,d^3}+\frac{ia^2}{2c\,d^3\,(icx+1)^2}+\frac{b^2\arctan(cx)\ln(cx+i)}{8c\,d^3}-\frac{b^2\arctan(cx)\ln(cx-i)}{8c\,d^3}-\frac{b^2\arctan(c}{4c\,d^3\,(cx-}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x)
```

```
[Out] -1/16*I/c*b^2/d^3*ln(-1/2*I*(-c*x+I))*ln(-1/2*I*(I+c*x))+1/2*I/c*a^2/d^3/(1
+I*c*x)^2+1/8/c*b^2/d^3*arctan(c*x)*ln(I+c*x)-1/8/c*b^2/d^3*arctan(c*x)*ln(
c*x-I)-1/4/c*b^2/d^3*arctan(c*x)/(c*x-I)^2-1/4*I/c*a*b/d^3/(c*x-I)+1/16*I/c
*b^2/d^3/(c*x-I)^2+1/2*I/c*b^2/d^3/(1+I*c*x)^2*arctan(c*x)^2-1/32*I/c*b^2/d
^3*ln(c*x-I)^2-3/16*b^2*arctan(c*x)/c/d^3-3/16/c*b^2/d^3/(c*x-I)-1/4*I/c*b^
2/d^3*arctan(c*x)/(c*x-I)+1/16*I/c*b^2/d^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))-1/3
2*I/c*b^2/d^3*ln(I+c*x)^2+1/16*I/c*b^2/d^3*ln(-1/2*I*(-c*x+I))*ln(I+c*x)+I/
c*a*b/d^3/(1+I*c*x)^2*arctan(c*x)-1/4/c*a*b/d^3/(c*x-I)^2-1/4*I/c*a*b/d^3*a
rctan(c*x)
```

maxima [A] time = 0.67, size = 136, normalized size = 0.76

$$-\frac{\left(4i\,ab+3\,b^2\right)cx+\left(2i\,b^2c^2x^2+4\,b^2cx+6i\,b^2\right)\arctan(cx)^2+8i\,a^2+8\,ab-4i\,b^2+\left(\left(4i\,ab+3\,b^2\right)c^2x^2+2\left(4\,ab\right.\right.}{16\,c^3d^3x^2-32i\,c^2d^3x-16\,cd^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -((4*I*a*b + 3*b^2)*c*x + (2*I*b^2*c^2*x^2 + 4*b^2*c*x + 6*I*b^2)*arctan(c*
x)^2 + 8*I*a^2 + 8*a*b - 4*I*b^2 + ((4*I*a*b + 3*b^2)*c^2*x^2 + 2*(4*a*b -
I*b^2)*c*x + 12*I*a*b + 5*b^2)*arctan(c*x))/(16*c^3*d^3*x^2 - 32*I*c^2*d^3*
x - 16*c*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))^2}{(d+c\,d\,x\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(d + c*d*x*1i)^3,x)
```

```
[Out] int((a + b*atan(c*x))^2/(d + c*d*x*1i)^3, x)
```

sympy [B] time = 65.27, size = 464, normalized size = 2.58

$$\frac{b(4a-3ib)\log\left(-\frac{b(4a-3ib)}{c}+x\left(4iab+3b^2\right)\right)}{32cd^3}-\frac{b(4a-3ib)\log\left(\frac{b(4a-3ib)}{c}+x\left(4iab+3b^2\right)\right)}{32cd^3}+\frac{\left(4iab+ib^2cx+2b^2\right)\mathrm{lo}}{-8ic^3d^3x^2-16c^2d^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/(d+I*c*d*x)**3,x)
```

```
[Out] b*(4*a - 3*I*b)*log(-b*(4*a - 3*I*b)/c + x*(4*I*a*b + 3*b**2))/(32*c*d**3)
- b*(4*a - 3*I*b)*log(b*(4*a - 3*I*b)/c + x*(4*I*a*b + 3*b**2))/(32*c*d**3)
 + (4*I*a*b + I*b**2*c*x + 2*b**2)*log(I*c*x + 1)/(-8*I*c**3*d**3*x**2 - 16
*c**2*d**3*x + 8*I*c*d**3) + (-b**2*c**2*x**2 + 2*I*b**2*c*x - 3*b**2)*log(
I*c*x + 1)**2/(32*I*c**3*d**3*x**2 + 64*c**2*d**3*x - 32*I*c*d**3) + (8*I*a
**2 + 8*a*b - 4*I*b**2 + x*(4*I*a*b*c + 3*b**2*c))/(-16*c**3*d**3*x**2 + 32
*I*c**2*d**3*x + 16*c*d**3) + (-8*a*b + I*b**2*c**2*x**2*log(I*c*x + 1) + 2
*b**2*c*x*log(I*c*x + 1) - 2*b**2*c*x + 3*I*b**2*log(I*c*x + 1) + 4*I*b**2)
*log(-I*c*x + 1)/(-16*c**3*d**3*x**2 + 32*I*c**2*d**3*x + 16*c*d**3) + (-I*
b**2*c**2*x**2 - 2*b**2*c*x - 3*I*b**2)*log(-I*c*x + 1)**2/(-32*c**3*d**3*x
**2 + 64*I*c**2*d**3*x + 32*c*d**3)
```

3.116 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)^3}\,dx$

Optimal. Leaf size=299

$$\frac{ib\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}+\frac{5b\left(a+b\tan^{-1}(cx)\right)}{4d^3(-cx+i)}+\frac{ib\left(a+b\tan^{-1}(cx)\right)}{4d^3(-cx+i)^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^3(-cx+i)}-\frac{\left(a+b\tan^{-1}\right.}{2d^3(-cx+}$$

```
[Out] 1/16*b^2/d^3/(I-c*x)^2-11/16*I*b^2/d^3/(I-c*x)+11/16*I*b^2*arctan(c*x)/d^3+
1/4*I*b*(a+b*arctan(c*x))/d^3/(I-c*x)^2+5/4*b*(a+b*arctan(c*x))/d^3/(I-c*x)
-5/8*(a+b*arctan(c*x))^2/d^3-1/2*(a+b*arctan(c*x))^2/d^3/(I-c*x)^2+I*(a+b*a
rctan(c*x))^2/d^3/(I-c*x)-2*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d^3
+(a+b*arctan(c*x))^2*ln(2/(1+I*c*x))/d^3+I*b*(a+b*arctan(c*x))*polylog(2,-1
+2/(1+I*c*x))/d^3+1/2*b^2*polylog(3,-1+2/(1+I*c*x))/d^3
```

Rubi [A] time = 0.79, antiderivative size = 299, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {4876, 4850, 4988, 4884, 4994, 6610, 4864, 4862, 627, 44, 203, 4854}

$$\frac{ib\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}+\frac{b^2\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d^3}+\frac{5b\left(a+b\tan^{-1}(cx)\right)}{4d^3(-cx+i)}+\frac{ib\left(a+b\tan^{-1}(c\right.}{4d^3(-cx+i)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x*(d + I*c*d*x)^3),x]
```

```
[Out] b^2/(16*d^3*(I - c*x)^2) - (((11*I)/16)*b^2)/(d^3*(I - c*x)) + (((11*I)/16)
*b^2*ArcTan[c*x])/d^3 + ((I/4)*b*(a + b*ArcTan[c*x]))/(d^3*(I - c*x)^2) + (
5*b*(a + b*ArcTan[c*x]))/(4*d^3*(I - c*x)) - (5*(a + b*ArcTan[c*x])^2)/(8*d
^3) - (a + b*ArcTan[c*x])^2/(2*d^3*(I - c*x)^2) + (I*(a + b*ArcTan[c*x])^2)
/(d^3*(I - c*x)) + (2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d^3
 + ((a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/d^3 + (I*b*(a + b*ArcTan[c*x]
)*PolyLog[2, -1 + 2/(1 + I*c*x)])/d^3 + (b^2*PolyLog[3, -1 + 2/(1 + I*c*x)]
)/(2*d^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
```

```
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+icdx)^3}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^3x} + \frac{c\left(a+b\tan^{-1}(cx)\right)^2}{d^3(-i+cx)^3} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^3(-i+cx)^2} - \frac{c\left(a+b\tan^{-1}\right.}{d^3(-i+c}\right.$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx}{d^3} + \frac{(ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}\,dx}{d^3} + \frac{c\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^3}\,dx}{d^3} - \frac{c\int \frac{\left(a+b\tan^{-1}(cx)\right)}{-i+cx}}{d^3}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(i-cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^3(i-cx)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^3}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(i-cx)^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{d^3(i-cx)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^3}$$

$$= \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} + \frac{5b\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} - \frac{5\left(a+b\tan^{-1}(cx)\right)^2}{8d^3} - \frac{\left(a+b\tan^{-1}(cx)\right.}{2d^3(i-cx)^2}$$

$$= \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} + \frac{5b\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} - \frac{5\left(a+b\tan^{-1}(cx)\right)^2}{8d^3} - \frac{\left(a+b\tan^{-1}(cx)\right.}{2d^3(i-cx)^2}$$

$$= \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} + \frac{5b\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} - \frac{5\left(a+b\tan^{-1}(cx)\right)^2}{8d^3} - \frac{\left(a+b\tan^{-1}(cx)\right.}{2d^3(i-cx)^2}$$

$$= \frac{b^2}{16d^3(i-cx)^2} - \frac{11ib^2}{16d^3(i-cx)} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} + \frac{5b\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} - \frac{5\left(a+b\right.}{}$$

$$= \frac{b^2}{16d^3(i-cx)^2} - \frac{11ib^2}{16d^3(i-cx)} + \frac{11ib^2\tan^{-1}(cx)}{16d^3} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} + \frac{5b\left(a+b\tan\right.}{4d^3(i-c}$$

Mathematica [A] time = 1.70, size = 435, normalized size = 1.45

$$-96a^2\log\left(c^2x^2+1\right) - \frac{192ia^2}{cx-i} - \frac{96a^2}{(cx-i)^2} + 192a^2\log(cx) - 192ia^2\tan^{-1}(cx) + 12iab\left(-16\mathrm{Li}_2\left(e^{2i\tan^{-1}(cx)}\right) - 32\tan^{-1}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x*(d + I*c*d*x)^3),x]
```

```
[Out] ((-96*a^2)/(-I + c*x)^2 - ((192*I)*a^2)/(-I + c*x) - (192*I)*a^2*ArcTan[c*x
] + 192*a^2*Log[c*x] - 96*a^2*Log[1 + c^2*x^2] + (12*I)*a*b*(-32*ArcTan[c*x
]^2 - 12*Cos[2*ArcTan[c*x]] - Cos[4*ArcTan[c*x]] - 16*PolyLog[2, E^((2*I)*A
rcTan[c*x])] + (12*I)*Sin[2*ArcTan[c*x]] - (4*I)*ArcTan[c*x]*(6*Cos[2*ArcTa
n[c*x]] + Cos[4*ArcTan[c*x]] + 8*Log[1 - E^((2*I)*ArcTan[c*x])] - (6*I)*Sin
[2*ArcTan[c*x]] - I*Sin[4*ArcTan[c*x]]) + I*Sin[4*ArcTan[c*x]]) + b^2*((-8*
I)*Pi^3 - 72*Cos[2*ArcTan[c*x]] - (144*I)*ArcTan[c*x]*Cos[2*ArcTan[c*x]] +
144*ArcTan[c*x]^2*Cos[2*ArcTan[c*x]] - 3*Cos[4*ArcTan[c*x]] - (12*I)*ArcTan
[c*x]*Cos[4*ArcTan[c*x]] + 24*ArcTan[c*x]^2*Cos[4*ArcTan[c*x]] + 192*ArcTan
[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] + (192*I)*ArcTan[c*x]*PolyLog[2, E^
((-2*I)*ArcTan[c*x])] + 96*PolyLog[3, E^((-2*I)*ArcTan[c*x])] + (72*I)*Sin[
2*ArcTan[c*x]] - 144*ArcTan[c*x]*Sin[2*ArcTan[c*x]] - (144*I)*ArcTan[c*x]^2
*Sin[2*ArcTan[c*x]] + (3*I)*Sin[4*ArcTan[c*x]] - 12*ArcTan[c*x]*Sin[4*ArcTa
n[c*x]] - (24*I)*ArcTan[c*x]^2*Sin[4*ArcTan[c*x]]))/(192*d^3)
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{-i\,b^2\log\left(-\frac{cx+i}{cx-i}\right)^2 - 4\,ab\log\left(-\frac{cx+i}{cx-i}\right) + 4i\,a^2}{4\,c^3d^3x^4 - 12i\,c^2d^3x^3 - 12\,cd^3x^2 + 4i\,d^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral((-I*b^2*log(-(c*x + I)/(c*x - I))^2 - 4*a*b*log(-(c*x + I)/(c*x -
I)) + 4*I*a^2)/(4*c^3*d^3*x^4 - 12*I*c^2*d^3*x^3 - 12*c*d^3*x^2 + 4*I*d^3*x
), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.60, size = 2151, normalized size = 7.19

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^3,x)
```

```
[Out] -b^2/d^3*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+b^2/d^3*arctan(c*x)^2*
ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2/d^3*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2
*x^2+1)^(1/2))+b^2/d^3*arctan(c*x)^2*ln(c*x)+3/8*I*b^2/d^3/(c*x-I)-2/3*I*b^
2/d^3*arctan(c*x)^3-I*a^2/d^3/(c*x-I)-I*a^2/d^3*arctan(c*x)-5/4*a*b/d^3*arc
tan(c*x)-5/4*a*b/d^3/(c*x-I)-3*b^2/d^3*arctan(c*x)/(4*c*x-4*I)+b^2/d^3*arct
an(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-1/2*I*b^2/d^3*Pi*csgn(((1+I*c*x)^
2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2/d^3
*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(
c*x)^2-1/2*I*b^2/d^3*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+
1)+1))^3*arctan(c*x)^2+1/2*I*b^2/d^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/
((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-I*b^2/d^3*Pi*arctan(c*x)^2*csg
n((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2+I*a*b/d^3*ln(c*x-I
)*ln(-1/2*I*(I+c*x))-I*a*b/d^3*ln(c*x)*ln(-I*(I+c*x))-I*a*b/d^3*ln(-I*c*x)*
ln(-I*(-c*x+I))+1/8*b^2/d^3*arctan(c*x)/(c*x-I)^2*c*x-1/32*I*b^2/d^3/(c*x-I
)^2*c*x+I*a*b/d^3*ln(c*x)*ln(-I*(-c*x+I))-2*I*a*b/d^3*arctan(c*x)/(c*x-I)-1
/2*b^2/d^3*arctan(c*x)^2/(c*x-I)^2-b^2/d^3*ln(c*x-I)*arctan(c*x)^2+1/2*I*b^
2/d^3*arctan(c*x)^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2
/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2-1/64*b^2/d^3/(c*x-I)^2*c^2*x^2+
2*b^2/d^3*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*b^2/d^3*polylog(3,-(1+I*
c*x)/(c^2*x^2+1)^(1/2))+1/16*I*b^2/d^3*arctan(c*x)/(c*x-I)^2-2*a*b/d^3*arct
an(c*x)*ln(c*x-I)-a*b/d^3*arctan(c*x)/(c*x-I)^2-I*b^2/d^3*arctan(c*x)^2/(c*
x-I)+1/4*I*a*b/d^3/(c*x-I)^2+3/8*b^2/d^3/(c*x-I)*c*x+I*a*b/d^3*dilog(-1/2*I
*(I+c*x))-I*a*b/d^3*dilog(-I*(I+c*x))-I*a*b/d^3*dilog(-I*c*x)-1/2*I*a*b/d^3
*ln(c*x-I)^2-2*I*b^2/d^3*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2)
)-2*I*b^2/d^3*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+3/2*I*b^2/
d^3*arctan(c*x)^2*Pi+2*a*b/d^3*arctan(c*x)*ln(c*x)-1/16*I*b^2/d^3*arctan(c*
x)/(c*x-I)^2*c^2*x^2-1/2*I*b^2/d^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*c
sgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x
)^2-1/2*I*b^2/d^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x
```

```
^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*a
rctan(c*x)^2+3*I*b^2/d^3*arctan(c*x)/(4*c*x-4*I)*c*x-1/2*I*b^2/d^3*Pi*csgn(
I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x
)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*b^2/d^3*arctan(c*x)^2*Pi*csgn((1+
I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))^2+1/2*I*b^2/d^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*
arctan(c*x)^2-1/2*I*b^2/d^3*arctan(c*x)^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1
)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))+1/2*I*b^2/d^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csg
n(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c
*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+1/64*b^2/d^3/(c*x-I)^2-5/8*b^2/d^3*arct
an(c*x)^2-1/2*a^2/d^3*ln(c^2*x^2+1)-1/2*a^2/d^3/(c*x-I)^2+a^2/d^3*ln(c*x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2}{x\,(d + c\,d\,x\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x*(d + c*d*x*1i)^3),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x*(d + c*d*x*1i)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.117 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+icdx)^3}\,dx$

Optimal. Leaf size=391

$$\frac{3bc\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}-\frac{9ibc\left(a+b\tan^{-1}(cx)\right)}{4d^3(-cx+i)}+\frac{bc\left(a+b\tan^{-1}(cx)\right)}{4d^3(-cx+i)^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^3x}+\frac{2c\left(a+\right.}{d^3}$$

```
[Out] -1/16*I*b^2*c/d^3/(I-c*x)^2-19/16*b^2*c/d^3/(I-c*x)+19/16*b^2*c*arctan(c*x)
/d^3+1/4*b*c*(a+b*arctan(c*x))/d^3/(I-c*x)^2-9/4*I*b*c*(a+b*arctan(c*x))/d^
3/(I-c*x)+1/8*I*c*(a+b*arctan(c*x))^2/d^3-(a+b*arctan(c*x))^2/d^3/x+1/2*I*c
*(a+b*arctan(c*x))^2/d^3/(I-c*x)^2+2*c*(a+b*arctan(c*x))^2/d^3/(I-c*x)+6*I*
c*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d^3-3*I*c*(a+b*arctan(c*x))^2
*ln(2/(1+I*c*x))/d^3+2*b*c*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))/d^3-I*b^2*c*
polylog(2,-1+2/(1-I*c*x))/d^3+3*b*c*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c
*x))/d^3-3/2*I*b^2*c*polylog(3,-1+2/(1+I*c*x))/d^3
```

Rubi [A] time = 0.98, antiderivative size = 391, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 16, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.640, Rules used = {4876, 4852, 4924, 4868, 2447, 4850, 4988, 4884, 4994, 6610, 4864, 4862, 627, 44, 203, 4854}

$$\frac{3bc\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}-\frac{ib^2c\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)}{d^3}-\frac{3ib^2c\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)}{2d^3}-\frac{9}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^2*(d + I*c*d*x)^3),x]
```

```
[Out] ((-I/16)*b^2*c)/(d^3*(I - c*x)^2) - (19*b^2*c)/(16*d^3*(I - c*x)) + (19*b^2
*c*ArcTan[c*x])/(16*d^3) + (b*c*(a + b*ArcTan[c*x]))/(4*d^3*(I - c*x)^2) -
(((9*I)/4)*b*c*(a + b*ArcTan[c*x]))/(d^3*(I - c*x)) + ((I/8)*c*(a + b*ArcTa
n[c*x])^2)/d^3 - (a + b*ArcTan[c*x])^2/(d^3*x) + ((I/2)*c*(a + b*ArcTan[c*x
])^2)/(d^3*(I - c*x)^2) + (2*c*(a + b*ArcTan[c*x])^2)/(d^3*(I - c*x)) - ((6
*I)*c*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d^3 - ((3*I)*c*(a +
 b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/d^3 + (2*b*c*(a + b*ArcTan[c*x])*Log[
2 - 2/(1 - I*c*x)])/d^3 - (I*b^2*c*PolyLog[2, -1 + 2/(1 - I*c*x)])/d^3 + (3
*b*c*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d^3 - (((3*I)/2)*b
^2*c*PolyLog[3, -1 + 2/(1 + I*c*x)])/d^3
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
```

```
rQ[m + p]))
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
```

```
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+icdx)^3}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^3x^2} - \frac{3ic\left(a+b\tan^{-1}(cx)\right)^2}{d^3x} - \frac{ic^2\left(a+b\tan^{-1}(cx)\right)^2}{d^3(-i+cx)^3} + \frac{2c^2\left(a+b\,\mathrm{t}\right.}{d^3(-i}\right.$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}dx}{d^3} - \frac{(3ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}dx}{d^3} - \frac{\left(ic^2\right)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^3}dx}{d^3} + \frac{\left(3ic^2\right)\int \frac{(a\cdot}{}}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^3x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(i-cx)^2} + \frac{2c\left(a+b\tan^{-1}(cx)\right)^2}{d^3(i-cx)} - \frac{6ic\left(a+b\tan^{-1}\right.}{}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^3} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^3x} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(i-cx)^2} + \frac{2c\left(a+b\tan^{-1}(\right.}{d^3(i-cx)}$$

$$= \frac{bc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} - \frac{9ibc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{8d^3} - \frac{\left(a+b\tan^{-1}(c\right.}{d^3x}$$

$$= \frac{bc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} - \frac{9ibc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{8d^3} - \frac{\left(a+b\tan^{-1}(c\right.}{d^3x}$$

$$= \frac{bc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} - \frac{9ibc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{8d^3} - \frac{\left(a+b\tan^{-1}(c\right.}{d^3x}$$

$$= -\frac{ib^2c}{16d^3(i-cx)^2} - \frac{19b^2c}{16d^3(i-cx)} + \frac{bc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} - \frac{9ibc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)} + \frac{ic\left(a\right.}{}$$

$$= -\frac{ib^2c}{16d^3(i-cx)^2} - \frac{19b^2c}{16d^3(i-cx)} + \frac{19b^2c\tan^{-1}(cx)}{16d^3} + \frac{bc\left(a+b\tan^{-1}(cx)\right)}{4d^3(i-cx)^2} - \frac{9ibc\left(a+b\right.}{4d^3(i}$$

Mathematica [A] time = 3.85, size = 549, normalized size = 1.40

$$-\frac{-96ia^2c\log\left(c^2x^2+1\right) + \frac{128a^2c}{cx-i} - \frac{32ia^2c}{(cx-i)^2} + 192ia^2c\log(x) + 192a^2c\tan^{-1}(cx) + \frac{64a^2}{x} + \frac{4ab\left(cx\left(-32\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)-20i\sin\right.\right.}{}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^2*(d + I*c*d*x)^3),x]
```

```
[Out] -1/64*((64*a^2)/x - ((32*I)*a^2*c)/(-I + c*x)^2 + (128*a^2*c)/(-I + c*x) +
192*a^2*c*ArcTan[c*x] + (192*I)*a^2*c*Log[x] - (96*I)*a^2*c*Log[1 + c^2*x^2
] - I*b^2*c*((8*I)*Pi^3 - 64*ArcTan[c*x]^2 + ((64*I)*ArcTan[c*x]^2)/(c*x) +
 40*Cos[2*ArcTan[c*x]] + (80*I)*ArcTan[c*x]*Cos[2*ArcTan[c*x]] - 80*ArcTan[
c*x]^2*Cos[2*ArcTan[c*x]] + Cos[4*ArcTan[c*x]] + (4*I)*ArcTan[c*x]*Cos[4*Ar
cTan[c*x]] - 8*ArcTan[c*x]^2*Cos[4*ArcTan[c*x]] - 192*ArcTan[c*x]^2*Log[1 -
 E^((-2*I)*ArcTan[c*x])] - (128*I)*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x]
)] - (192*I)*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] - 64*PolyLog[2,
 E^((2*I)*ArcTan[c*x])] - 96*PolyLog[3, E^((-2*I)*ArcTan[c*x])] - (40*I)*Si
n[2*ArcTan[c*x]] + 80*ArcTan[c*x]*Sin[2*ArcTan[c*x]] + (80*I)*ArcTan[c*x]^2
*Sin[2*ArcTan[c*x]] - I*Sin[4*ArcTan[c*x]] + 4*ArcTan[c*x]*Sin[4*ArcTan[c*x
]] + (8*I)*ArcTan[c*x]^2*Sin[4*ArcTan[c*x]]) + (4*a*b*(96*c*x*ArcTan[c*x]^2
 + 48*c*x*PolyLog[2, E^((2*I)*ArcTan[c*x])] + c*x*(20*Cos[2*ArcTan[c*x]] +
Cos[4*ArcTan[c*x]] - 32*Log[(c*x)/Sqrt[1 + c^2*x^2]] - (20*I)*Sin[2*ArcTan[
c*x]] - I*Sin[4*ArcTan[c*x]]) + 4*ArcTan[c*x]*(8 + (10*I)*c*x*Cos[2*ArcTan[
c*x]] + I*c*x*Cos[4*ArcTan[c*x]] + (24*I)*c*x*Log[1 - E^((2*I)*ArcTan[c*x])
] + 10*c*x*Sin[2*ArcTan[c*x]] + c*x*Sin[4*ArcTan[c*x]])))/x)/d^3
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{-i\,b^2\log\left(-\frac{cx+i}{cx-i}\right)^2-4\,ab\log\left(-\frac{cx+i}{cx-i}\right)+4i\,a^2}{4\,c^3d^3x^5-12i\,c^2d^3x^4-12\,cd^3x^3+4i\,d^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] integral((-I*b^2*log(-(c*x + I)/(c*x - I))^2 - 4*a*b*log(-(c*x + I)/(c*x -
I)) + 4*I*a^2)/(4*c^3*d^3*x^5 - 12*I*c^2*d^3*x^4 - 12*c*d^3*x^3 + 4*I*d^3*x
^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 1.62, size = 9659, normalized size = 24.70

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^3,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\left(c\,x\right))^2}{x^2\,(d+c\,d\,x\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^2*(d + c*d*x*1i)^3),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^2*(d + c*d*x*1i)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**2/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.118 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(1+icx)^4}\,dx$

Optimal. Leaf size=207

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)}{12c(-cx+i)}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{12c(-cx+i)^2}-\frac{ib\left(a+b\tan^{-1}(cx)\right)}{9c(-cx+i)^3}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{24c}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{3c(1+icx)^3}+\frac{11}{144c(-}$$

```
[Out] -1/54*b^2/c/(I-c*x)^3+5/144*I*b^2/c/(I-c*x)^2+11/144*b^2/c/(I-c*x)-11/144*b
^2*arctan(c*x)/c-1/9*I*b*(a+b*arctan(c*x))/c/(I-c*x)^3-1/12*b*(a+b*arctan(c
*x))/c/(I-c*x)^2+1/12*I*b*(a+b*arctan(c*x))/c/(I-c*x)-1/24*I*(a+b*arctan(c*
x))^2/c+1/3*I*(a+b*arctan(c*x))^2/c/(1+I*c*x)^3
```

Rubi [A] time = 0.22, antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.286$, Rules used = {4864, 4862, 627, 44, 203, 4884}

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)}{12c(-cx+i)}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{12c(-cx+i)^2}-\frac{ib\left(a+b\tan^{-1}(cx)\right)}{9c(-cx+i)^3}-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{24c}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{3c(1+icx)^3}+\frac{11}{144c(-}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(1 + I*c*x)^4,x]
```

```
[Out] -b^2/(54*c*(I - c*x)^3) + (((5*I)/144)*b^2)/(c*(I - c*x)^2) + (11*b^2)/(144
*c*(I - c*x)) - (11*b^2*ArcTan[c*x])/(144*c) - ((I/9)*b*(a + b*ArcTan[c*x])
)/(c*(I - c*x)^3) - (b*(a + b*ArcTan[c*x]))/(12*c*(I - c*x)^2) + ((I/12)*b*
(a + b*ArcTan[c*x]))/(c*(I - c*x)) - ((I/24)*(a + b*ArcTan[c*x])^2)/c + ((I
/3)*(a + b*ArcTan[c*x])^2)/(c*(1 + I*c*x)^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(1+icx)^4}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{3c(1+icx)^3} - \frac{1}{3}(2ib)\int \left(\frac{a+b\tan^{-1}(cx)}{2(-i+cx)^4} + \frac{i\left(a+b\tan^{-1}(cx)\right)}{4(-i+cx)^3} - \frac{a+b\tan}{8(-i+}\right.$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{3c(1+icx)^3} + \frac{1}{12}(ib)\int \frac{a+b\tan^{-1}(cx)}{(-i+cx)^2}\,dx - \frac{1}{12}(ib)\int \frac{a+b\tan^{-1}(cx)}{1+c^2x^2}\,dx$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{9c(i-cx)^3} - \frac{b\left(a+b\tan^{-1}(cx)\right)}{12c(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{12c(i-cx)} - \frac{i\left(a+b\tan^{-1}\right.}{24c}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{9c(i-cx)^3} - \frac{b\left(a+b\tan^{-1}(cx)\right)}{12c(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{12c(i-cx)} - \frac{i\left(a+b\tan^{-1}\right.}{24c}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)}{9c(i-cx)^3} - \frac{b\left(a+b\tan^{-1}(cx)\right)}{12c(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)}{12c(i-cx)} - \frac{i\left(a+b\tan^{-1}\right.}{24c}$$

$$= -\frac{b^2}{54c(i-cx)^3} + \frac{5ib^2}{144c(i-cx)^2} + \frac{11b^2}{144c(i-cx)} - \frac{ib\left(a+b\tan^{-1}(cx)\right)}{9c(i-cx)^3} - \frac{b\left(a+b\tan\right.}{12c(i-c}$$

$$= -\frac{b^2}{54c(i-cx)^3} + \frac{5ib^2}{144c(i-cx)^2} + \frac{11b^2}{144c(i-cx)} - \frac{11b^2\tan^{-1}(cx)}{144c} - \frac{ib\left(a+b\tan^{-1}(cx\right.}{9c(i-cx)^3}$$

Mathematica [A] time = 0.23, size = 155, normalized size = 0.75

$$-\frac{144a^2+12ab\left(3ic^2x^2+9cx-10i\right)+3b(cx+i)\tan^{-1}(cx)\left(12a\left(ic^2x^2+4cx-7i\right)+b\left(11c^2x^2-32icx-29\right)\right)+}{432c(cx-i)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(1 + I*c*x)^4,x]
```

```
[Out] -1/432*(144*a^2 + 12*a*b*(-10*I + 9*c*x + (3*I)*c^2*x^2) + b^2*(-56 - (81*I
)*c*x + 33*c^2*x^2) + 3*b*(I + c*x)*(12*a*(-7*I + 4*c*x + I*c^2*x^2) + b*(-
29 - (32*I)*c*x + 11*c^2*x^2))*ArcTan[c*x] + 18*b^2*(7 - (3*I)*c*x + 3*c^2*
x^2 + I*c^3*x^3)*ArcTan[c*x]^2)/(c*(-I + c*x)^3)
```

fricas [A] time = 0.80, size = 206, normalized size = 1.00

$$-\frac{6\left(12i\,ab+11\,b^2\right)c^2x^2+\left(216\,ab-162i\,b^2\right)cx-\left(9i\,b^2c^3x^3+27\,b^2c^2x^2-27i\,b^2cx+63\,b^2\right)\log\left(-\frac{cx+i}{cx-i}\right)^2+288}{864\,c^4x^3-2592}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(1+I*c*x)^4,x, algorithm="fricas")
```

```
[Out] -(6*(12*I*a*b + 11*b^2)*c^2*x^2 + (216*a*b - 162*I*b^2)*c*x - (9*I*b^2*c^3*
x^3 + 27*b^2*c^2*x^2 - 27*I*b^2*c*x + 63*b^2)*log(-(c*x + I)/(c*x - I))^2 +
 288*a^2 - 240*I*a*b - 112*b^2 - ((36*a*b - 33*I*b^2)*c^3*x^3 - 9*(12*I*a*b
 + 7*b^2)*c^2*x^2 - (108*a*b + 9*I*b^2)*c*x - 252*I*a*b - 87*b^2)*log(-(c*x
 + I)/(c*x - I)))/(864*c^4*x^3 - 2592*I*c^3*x^2 - 2592*c^2*x + 864*I*c)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(1+I*c*x)^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.09, size = 404, normalized size = 1.95

$$-\frac{i b^{2} \ln\left(-\frac{i(-cx+i)}{2}\right) \ln\left(-\frac{i(cx+i)}{2}\right)}{48c}-\frac{i b^{2} \ln\left(cx+i\right)^{2}}{96c}+\frac{b^{2} \arctan\left(cx\right) \ln\left(cx+i\right)}{24c}-\frac{b^{2} \arctan\left(cx\right) \ln\left(cx-i\right)}{24c}-\frac{b^{2} \arctan\left(c\right.}{12c\left(cx-i\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/(1+I*c*x)^4,x)
```

```
[Out] -1/48*I/c*b^2*ln(-1/2*I*(-c*x+I))*ln(-1/2*I*(I+c*x))-1/96*I/c*b^2*ln(I+c*x)
^2+1/24/c*b^2*arctan(c*x)*ln(I+c*x)-1/24/c*b^2*arctan(c*x)*ln(c*x-I)-1/12/c
*b^2*arctan(c*x)/(c*x-I)^2+1/48*I/c*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/9*I/
c*b^2*arctan(c*x)/(c*x-I)^3-11/144*b^2*arctan(c*x)/c+1/54/c*b^2/(c*x-I)^3-1
1/144/c*b^2/(c*x-I)-1/12*I/c*b^2*arctan(c*x)/(c*x-I)+1/9*I/c*a*b/(c*x-I)^3+
2/3*I/c*a*b/(1+I*c*x)^3*arctan(c*x)-1/12*I/c*a*b*arctan(c*x)+5/144*I/c*b^2/
(c*x-I)^2+1/3*I/c*b^2/(1+I*c*x)^3*arctan(c*x)^2-1/96*I/c*b^2*ln(c*x-I)^2+1/
3*I/c*a^2/(1+I*c*x)^3-1/12/c*a*b/(c*x-I)^2+1/48*I/c*b^2*ln(-1/2*I*(-c*x+I))
*ln(I+c*x)-1/12*I/c*a*b/(c*x-I)
```

maxima [A] time = 0.43, size = 181, normalized size = 0.87

$$-\frac{\left(36 i\, ab+33\, b^{2}\right)c^{2}x^{2}+27\left(4\, ab-3 i\, b^{2}\right)cx+\left(18 i\, b^{2}c^{3}x^{3}+54\, b^{2}c^{2}x^{2}-54 i\, b^{2}cx+126\, b^{2}\right)\arctan\left(cx\right)^{2}+144\, a^{2}-}{432\, c^{4}x^{3}-1296 i\, c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(1+I*c*x)^4,x, algorithm="maxima")
```

```
[Out] -((36*I*a*b + 33*b^2)*c^2*x^2 + 27*(4*a*b - 3*I*b^2)*c*x + (18*I*b^2*c^3*x^
3 + 54*b^2*c^2*x^2 - 54*I*b^2*c*x + 126*b^2)*arctan(c*x)^2 + 144*a^2 - 120*
I*a*b - 56*b^2 + ((36*I*a*b + 33*b^2)*c^3*x^3 + 9*(12*a*b - 7*I*b^2)*c^2*x^
2 + (-108*I*a*b + 9*b^2)*c*x + 252*a*b - 87*I*b^2)*arctan(c*x))/(432*c^4*x^
3 - 1296*I*c^3*x^2 - 1296*c^2*x + 432*I*c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2}{{\left(1+c\,x\,1{}\mathrm{i}\right)}^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(c*x*1i + 1)^4,x)
```

```
[Out] int((a + b*atan(c*x))^2/(c*x*1i + 1)^4, x)
```

sympy [B] time = 90.24, size = 549, normalized size = 2.65

$$\frac{b\,(12a-11ib)\log\left(-\frac{b(12a-11ib)}{c}+x\left(12iab+11b^2\right)\right)}{288c}-\frac{b\,(12a-11ib)\log\left(\frac{b(12a-11ib)}{c}+x\left(12iab+11b^2\right)\right)}{288c}+\frac{(48ab-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/(1+I*c*x)**4,x)
```

```
[Out] b*(12*a - 11*I*b)*log(-b*(12*a - 11*I*b)/c + x*(12*I*a*b + 11*b**2))/(288*c
) - b*(12*a - 11*I*b)*log(b*(12*a - 11*I*b)/c + x*(12*I*a*b + 11*b**2))/(28
8*c) + (48*a*b + 3*b**2*c**3*x**3*log(I*c*x + 1) - 9*I*b**2*c**2*x**2*log(I
*c*x + 1) + 6*I*b**2*c**2*x**2 - 9*b**2*c*x*log(I*c*x + 1) + 18*b**2*c*x -
21*I*b**2*log(I*c*x + 1) - 20*I*b**2)*log(-I*c*x + 1)/(144*I*c**4*x**3 + 43
2*c**3*x**2 - 432*I*c**2*x - 144*c) + (-b**2*c**3*x**3 + 3*I*b**2*c**2*x**2
 + 3*b**2*c*x + 7*I*b**2)*log(-I*c*x + 1)**2/(96*I*c**4*x**3 + 288*c**3*x**
2 - 288*I*c**2*x - 96*c) + (24*I*a*b - 3*b**2*c**2*x**2 + 9*I*b**2*c*x + 10
*b**2)*log(I*c*x + 1)/(72*c**4*x**3 - 216*I*c**3*x**2 - 216*c**2*x + 72*I*c
) + (-I*b**2*c**3*x**3 - 3*b**2*c**2*x**2 + 3*I*b**2*c*x - 7*b**2)*log(I*c*
x + 1)**2/(-96*c**4*x**3 + 288*I*c**3*x**2 + 288*c**2*x - 96*I*c) - (-144*a
**2 + 120*I*a*b + 56*b**2 + x**2*(-36*I*a*b*c**2 - 33*b**2*c**2) + x*(-108*
a*b*c + 81*I*b**2*c))/(-432*c**4*x**3 + 1296*I*c**3*x**2 + 1296*c**2*x - 43
2*I*c)
```

3.119 $\int \frac{\tan^{-1}(ax)^2}{cx-iacx^2}\,dx$

Optimal. Leaf size=76

$$\frac{\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c}-\frac{i\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)^2}{c}$$

```
[Out] arctan(a*x)^2*ln(2-2/(1-I*a*x))/c-I*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))/c
+1/2*polylog(3,-1+2/(1-I*a*x))/c
```

Rubi [A] time = 0.14, antiderivative size = 76, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {1593, 4868, 4884, 4992, 6610}

$$\frac{\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c}-\frac{i\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)^2}{c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(c*x - I*a*c*x^2),x]
```

```
[Out] (ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c - (I*ArcTan[a*x]*PolyLog[2, -1 + 2
/(1 - I*a*x)])/c + PolyLog[3, -1 + 2/(1 - I*a*x)]/(2*c)
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{cx - iacx^2}\,dx = \int \frac{\tan^{-1}(ax)^2}{x(c - iacx)}\,dx$$
$$= \frac{\tan^{-1}(ax)^2 \log\left(2 - \frac{2}{1-iax}\right)}{c} - \frac{(2a)\int \frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{1+a^2x^2}\,dx}{c}$$
$$= \frac{\tan^{-1}(ax)^2 \log\left(2 - \frac{2}{1-iax}\right)}{c} - \frac{i\tan^{-1}(ax)\mathrm{Li}_2\left(-1 + \frac{2}{1-iax}\right)}{c} + \frac{(ia)\int \frac{\mathrm{Li}_2\left(-1+\frac{2}{1-iax}\right)}{1+a^2x^2}\,dx}{c}$$
$$= \frac{\tan^{-1}(ax)^2 \log\left(2 - \frac{2}{1-iax}\right)}{c} - \frac{i\tan^{-1}(ax)\mathrm{Li}_2\left(-1 + \frac{2}{1-iax}\right)}{c} + \frac{\mathrm{Li}_3\left(-1 + \frac{2}{1-iax}\right)}{2c}$$

Mathematica [A] time = 0.28, size = 82, normalized size = 1.08

$$\frac{24i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) + 12\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) + 16i\tan^{-1}(ax)^3 + 24\tan^{-1}(ax)^2\log\left(1 - e^{-2i\tan^{-1}(ax)}\right) - }{24c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(c*x - I*a*c*x^2),x]
[Out] ((-I)*Pi^3 + (16*I)*ArcTan[a*x]^3 + 24*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcT
an[a*x])] + (24*I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + 12*Poly
Log[3, E^((-2*I)*ArcTan[a*x])])/(24*c)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(-\frac{i\,\log\left(-\frac{ax+i}{ax-i}\right)^2}{4\left(acx^2 + i\,cx\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(c*x-I*a*c*x^2),x, algorithm="fricas")
[Out] integral(-1/4*I*log(-(a*x + I)/(a*x - I))^2/(a*c*x^2 + I*c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(c*x-I*a*c*x^2),x, algorithm="giac")
[Out] sage0*x
```

maple [B] time = 0.53, size = 183, normalized size = 2.41

$$\frac{\arctan(ax)^2 \ln\left(1 + \frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{c} - \frac{2i\arctan(ax)\,\mathrm{polylog}\left(2, -\frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{c} + \frac{2\,\mathrm{polylog}\left(3, -\frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{c} + \frac{\arctan(ax)^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/(c*x-I*a*c*x^2),x)
[Out] 1/c*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I/c*arctan(a*x)*polyl
og(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2/c*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/
```

```
2))+1/c*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I/c*arctan(a*x)*p
olylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+2/c*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(
1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{8i\arctan\left(ax\right)^{3}-12\arctan\left(ax\right)^{2}\log\left(a^{2}x^{2}+1\right)-6i\arctan\left(ax\right)\log\left(a^{2}x^{2}+1\right)^{2}+3\log\left(a^{2}x^{2}+1\right)^{2}\log\left(-a^{2}x^{2}\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(c*x-I*a*c*x^2),x, algorithm="maxima")
```

```
[Out] 1/96*(8*I*arctan(a*x)^3 - 12*arctan(a*x)^2*log(a^2*x^2 + 1) - 6*I*arctan(a*
x)*log(a^2*x^2 + 1)^2 + log(a^2*x^2 + 1)^3 + 24*I*(arctan(a*x)^3/c + 4*a*in
tegrate(1/16*x*log(a^2*x^2 + 1)^2/(a^2*c*x^3 + c*x), x) - 16*integrate(1/16
*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*c*x^3 + c*x), x))*c + 96*c*integrate(1/1
6*(4*a*x*arctan(a*x)*log(a^2*x^2 + 1) + 12*arctan(a*x)^2 + log(a^2*x^2 + 1)
^2)/(a^2*c*x^3 + c*x), x))/c
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}\left(a\,x\right)^2}{c\,x-a\,c\,x^2\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(c*x - a*c*x^2*1i),x)
```

```
[Out] int(atan(a*x)^2/(c*x - a*c*x^2*1i), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{i\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{ax^{2}+ix}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/(c*x-I*a*c*x**2),x)
```

```
[Out] I*Integral(atan(a*x)**2/(a*x**2 + I*x), x)/c
```

3.120 $\int (d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)^3 \, dx$

Optimal. Leaf size=382

$$-\frac{6ib^2d^3\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}-\frac{1}{4}ib^2cd^3x^2\left(a+b\tan^{-1}(cx)\right)-\frac{11ib^2d^3\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}-3$$

```
[Out] -3*a*b^2*d^3*x+1/4*I*b^3*d^3*x-1/4*I*b^3*d^3*arctan(c*x)/c-3*b^3*d^3*x*arct
an(c*x)-1/4*I*b^2*c*d^3*x^2*(a+b*arctan(c*x))+7*b*d^3*(a+b*arctan(c*x))^2/c
-21/4*I*b*d^3*x*(a+b*arctan(c*x))^2+3/2*b*c*d^3*x^2*(a+b*arctan(c*x))^2-6*I
*b^2*d^3*(a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/c+1/4*I*b*c^2*d^3*x^3*(
a+b*arctan(c*x))^2+6*b*d^3*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/c-11*I*b^2*d
^3*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c+3/2*b^3*d^3*ln(c^2*x^2+1)/c-1/4*I*d^
3*(1+I*c*x)^4*(a+b*arctan(c*x))^3/c+11/2*b^3*d^3*polylog(2,1-2/(1+I*c*x))/c
+3*b^3*d^3*polylog(3,1-2/(1-I*c*x))/c
```

Rubi [A] time = 0.71, antiderivative size = 382, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 15, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.682, Rules used = {4864, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 260, 4884, 321, 203, 1586, 4992, 6610}

$$-\frac{6ib^2d^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}+\frac{11b^3d^3\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c}+\frac{3b^3d^3\text{PolyLog}\left(3,1-\frac{2}{1-icx}\right)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^3,x]
```

```
[Out] -3*a*b^2*d^3*x + (I/4)*b^3*d^3*x - ((I/4)*b^3*d^3*ArcTan[c*x])/c - 3*b^3*d^
3*x*ArcTan[c*x] - (I/4)*b^2*c*d^3*x^2*(a + b*ArcTan[c*x]) + (7*b*d^3*(a + b
*ArcTan[c*x])^2)/c - ((21*I)/4)*b*d^3*x*(a + b*ArcTan[c*x])^2 + (3*b*c*d^3*
x^2*(a + b*ArcTan[c*x])^2)/2 + (I/4)*b*c^2*d^3*x^3*(a + b*ArcTan[c*x])^2 -
((I/4)*d^3*(1 + I*c*x)^4*(a + b*ArcTan[c*x])^3)/c + (6*b*d^3*(a + b*ArcTan[
c*x])^2*Log[2/(1 - I*c*x)])/c - ((11*I)*b^2*d^3*(a + b*ArcTan[c*x])*Log[2/(
1 + I*c*x)])/c + (3*b^3*d^3*Log[1 + c^2*x^2])/(2*c) - ((6*I)*b^2*d^3*(a + b
*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/c + (11*b^3*d^3*PolyLog[2, 1 -
 2/(1 + I*c*x)])/(2*c) + (3*b^3*d^3*PolyLog[3, 1 - 2/(1 - I*c*x)])/c
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] :> Int[u*PolynomialQuotient[Px
, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] &&
 EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (d+icdx)^3 \left(a+b\tan^{-1}(cx)\right)^3 \, dx = -\frac{id^3(1+icx)^4 \left(a+b\tan^{-1}(cx)\right)^3}{4c} + \frac{(3ib)\int \left(-7d^4\left(a+b\tan^{-1}(cx)\right)^2 - 4\right.}{}$$

$$= -\frac{id^3(1+icx)^4 \left(a+b\tan^{-1}(cx)\right)^3}{4c} + \frac{(6b)\int \frac{\left(id^4-cd^4x\right)\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}\,dx}{d} - \frac{1}{4}$$

$$= -\frac{21}{4}ibd^3x\left(a+b\tan^{-1}(cx)\right)^2 + \frac{3}{2}bcd^3x^2\left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{4}ibc^2d^3x^3$$

$$= \frac{21bd^3\left(a+b\tan^{-1}(cx)\right)^2}{4c} - \frac{21}{4}ibd^3x\left(a+b\tan^{-1}(cx)\right)^2 + \frac{3}{2}bcd^3x^2\left(a+b\right.$$

$$= -3ab^2d^3x - \frac{1}{4}ib^2cd^3x^2\left(a+b\tan^{-1}(cx)\right) + \frac{7bd^3\left(a+b\tan^{-1}(cx)\right)^2}{c} - \frac{21}{4}$$

$$= -3ab^2d^3x + \frac{1}{4}ib^3d^3x - 3b^3d^3x\tan^{-1}(cx) - \frac{1}{4}ib^2cd^3x^2\left(a+b\tan^{-1}(cx)\right) -$$

$$= -3ab^2d^3x + \frac{1}{4}ib^3d^3x - \frac{ib^3d^3\tan^{-1}(cx)}{4c} - 3b^3d^3x\tan^{-1}(cx) - \frac{1}{4}ib^2cd^3x^2$$

$$= -3ab^2d^3x + \frac{1}{4}ib^3d^3x - \frac{ib^3d^3\tan^{-1}(cx)}{4c} - 3b^3d^3x\tan^{-1}(cx) - \frac{1}{4}ib^2cd^3x^2$$

Mathematica [A] time = 1.80, size = 693, normalized size = 1.81

$$-\frac{id^3\left(a^3c^4x^4 - 4ia^3c^3x^3 - 6a^3c^2x^2 + 4ia^3cx + 3a^2bc^4x^4\tan^{-1}(cx) - a^2bc^3x^3 - 12ia^2bc^3x^3\tan^{-1}(cx) + 6ia^2bc^2x\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + I*c*d*x)^3*(a + b*ArcTan[c*x])^3,x]
```

```
[Out] ((-1/4*I)*d^3*(a*b^2 + (4*I)*a^3*c*x + 21*a^2*b*c*x - (12*I)*a*b^2*c*x - b^
3*c*x - 6*a^3*c^2*x^2 + (6*I)*a^2*b*c^2*x^2 + a*b^2*c^2*x^2 - (4*I)*a^3*c^3
```

```
*x^3 - a^2*b*c^3*x^3 + a^3*c^4*x^4 - 21*a^2*b*ArcTan[c*x] + (12*I)*a*b^2*Ar
cTan[c*x] + b^3*ArcTan[c*x] + (12*I)*a^2*b*c*x*ArcTan[c*x] + 42*a*b^2*c*x*A
rcTan[c*x] - (12*I)*b^3*c*x*ArcTan[c*x] - 18*a^2*b*c^2*x^2*ArcTan[c*x] + (1
2*I)*a*b^2*c^2*x^2*ArcTan[c*x] + b^3*c^2*x^2*ArcTan[c*x] - (12*I)*a^2*b*c^3
*x^3*ArcTan[c*x] - 2*a*b^2*c^3*x^3*ArcTan[c*x] + 3*a^2*b*c^4*x^4*ArcTan[c*x
] + 3*a*b^2*ArcTan[c*x]^2 - (16*I)*b^3*ArcTan[c*x]^2 + (12*I)*a*b^2*c*x*Arc
Tan[c*x]^2 + 21*b^3*c*x*ArcTan[c*x]^2 - 18*a*b^2*c^2*x^2*ArcTan[c*x]^2 + (6
*I)*b^3*c^2*x^2*ArcTan[c*x]^2 - (12*I)*a*b^2*c^3*x^3*ArcTan[c*x]^2 - b^3*c^
3*x^3*ArcTan[c*x]^2 + 3*a*b^2*c^4*x^4*ArcTan[c*x]^2 + b^3*ArcTan[c*x]^3 + (
4*I)*b^3*c*x*ArcTan[c*x]^3 - 6*b^3*c^2*x^2*ArcTan[c*x]^3 - (4*I)*b^3*c^3*x^
3*ArcTan[c*x]^3 + b^3*c^4*x^4*ArcTan[c*x]^3 + (48*I)*a*b^2*ArcTan[c*x]*Log[
1 + E^((2*I)*ArcTan[c*x])] + 44*b^3*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x
])] + (24*I)*b^3*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] - (12*I)*a^2*
b*Log[1 + c^2*x^2] - 22*a*b^2*Log[1 + c^2*x^2] + (6*I)*b^3*Log[1 + c^2*x^2]
 + 2*b^2*(12*a - (11*I)*b + 12*b*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c
*x])] + (12*I)*b^3*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/c
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$-\frac{1}{32}\left(b^3c^3d^3x^4 - 4i\,b^3c^2d^3x^3 - 6\,b^3cd^3x^2 + 4i\,b^3d^3x\right)\log\left(-\frac{cx+i}{cx-i}\right)^3 + \text{integral}\left(\frac{-16i\,a^3c^5d^3x^5 - 48\,a^3c^4d^3x^4 + 32}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^3,x, algorithm="fricas")
```

```
[Out] -1/32*(b^3*c^3*d^3*x^4 - 4*I*b^3*c^2*d^3*x^3 - 6*b^3*c*d^3*x^2 + 4*I*b^3*d^
3*x)*log(-(c*x + I)/(c*x - I))^3 + integral(1/16*(-16*I*a^3*c^5*d^3*x^5 - 4
8*a^3*c^4*d^3*x^4 + 32*I*a^3*c^3*d^3*x^3 - 32*a^3*c^2*d^3*x^2 + 48*I*a^3*c*
d^3*x + 16*a^3*d^3 + (12*I*a*b^2*c^5*d^3*x^5 + (36*a*b^2 - 3*I*b^3)*c^4*d^3
*x^4 - 12*(2*I*a*b^2 + b^3)*c^3*d^3*x^3 + (24*a*b^2 + 18*I*b^3)*c^2*d^3*x^2
 - 12*a*b^2*d^3 - 12*(3*I*a*b^2 - b^3)*c*d^3*x)*log(-(c*x + I)/(c*x - I))^2
 + (24*a^2*b*c^5*d^3*x^5 - 72*I*a^2*b*c^4*d^3*x^4 - 48*a^2*b*c^3*d^3*x^3 -
48*I*a^2*b*c^2*d^3*x^2 - 72*a^2*b*c*d^3*x + 24*I*a^2*b*d^3)*log(-(c*x + I)/
(c*x - I)))/(c^2*x^2 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 12.78, size = 2004, normalized size = 5.25

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^3*(a+b*arctan(c*x))^3,x)
```

```
[Out] -3*a*b^2*d^3*x-3*b^3*d^3*x*arctan(c*x)+x*a^3*d^3-3/2*I/c*d^3*b^3*Pi*csgn(I/
((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*
c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*arctan(c*x)^2+1/4*I*b^3*d
^3*x+3/2*c*d^3*a^2*b*x^2-3/c*d^3*a^2*b*ln(c^2*x^2+1)+3/c*d^3*a*b^2*arctan(c
*x)-3/c*d^3*b^3*arctan(c*x)^2*ln(c^2*x^2+1)+6/c*d^3*b^3*arctan(c*x)^2*ln((1
+I*c*x)/(c^2*x^2+1)^(1/2))+3/2*c*d^3*b^3*arctan(c*x)^2*x^2-c^2*d^3*b^3*arct
```

```
an(c*x)^3*x^3+6/c*d^3*b^3*ln(2)*arctan(c*x)^2+3*d^3*a*b^2*arctan(c*x)^2*x+3
*d^3*a^2*b*arctan(c*x)*x+11/4*I/c*d^3*b^3*arctan(c*x)-1/4*I*c^3*x^4*a^3*d^3
+3/2*I*c*x^2*a^3*d^3-1/4*I/c*d^3*b^3*arctan(c*x)^3-21/4*I*d^3*b^3*arctan(c*
x)^2*x-21/4*I*d^3*a^2*b*x-3*c^2*d^3*a*b^2*arctan(c*x)^2*x^3+3*c*d^3*a*b^2*a
rctan(c*x)*x^2-3*c^2*d^3*a^2*b*arctan(c*x)*x^3-6/c*d^3*a*b^2*arctan(c*x)*ln
(c^2*x^2+1)-6*I/c*d^3*b^3*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-1
1*I/c*d^3*b^3*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-11*I/c*d^3*b^
3*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+3/2*I/c*d^3*a*b^2*ln(c*x-
I)^2-3*I/c*d^3*a*b^2*dilog(1/2*I*(c*x-I))+21/4*I/c*d^3*a^2*b*arctan(c*x)+1/
4*I*c^2*d^3*a^2*b*x^3-1/4*I*c*d^3*b^3*arctan(c*x)*x^2-1/4*I*c^3*d^3*b^3*arc
tan(c*x)^3*x^4+3/2*I*c*d^3*b^3*arctan(c*x)^3*x^2+1/4*I*c^2*d^3*b^3*arctan(c
*x)^2*x^3-3/2*I/c*d^3*a*b^2*ln(I+c*x)^2+3*I/c*d^3*a*b^2*dilog(-1/2*I*(I+c*x
))+11/2*I/c*d^3*a*b^2*ln(c^2*x^2+1)+21/4*I/c*d^3*a*b^2*arctan(c*x)^2-1/4*I*
c*d^3*a*b^2*x^2-21/2*I*d^3*a*b^2*arctan(c*x)*x-1/4*I/c*d^3*a^3-c^2*x^3*a^3*
d^3+d^3*b^3*arctan(c*x)^3*x-11/c*d^3*b^3*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1
/2))-3/c*d^3*b^3*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-4/c*d^3*b^3*arctan(c*x)^2-11
/c*d^3*b^3*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+3/c*d^3*b^3*polylog(3,-(1
+I*c*x)^2/(c^2*x^2+1))+9/2*I*c*d^3*a*b^2*arctan(c*x)^2*x^2+1/2*I*c^2*d^3*a*
b^2*arctan(c*x)*x^3-3/4*I*c^3*d^3*a*b^2*arctan(c*x)^2*x^4-3/2*I/c*d^3*b^3*P
i*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*arctan(c*x)^2-3/2*I/c*d^3*b^3*Pi*csgn(I
*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*arctan(c*x)^2+3*I
/c*d^3*a*b^2*ln(I+c*x)*ln(c^2*x^2+1)+3*I/c*d^3*a*b^2*ln(c*x-I)*ln(-1/2*I*(I
+c*x))-3*I/c*d^3*a*b^2*ln(c*x-I)*ln(c^2*x^2+1)-3*I/c*d^3*a*b^2*ln(I+c*x)*ln
(1/2*I*(c*x-I))+3/2*I/c*d^3*b^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*
arctan(c*x)^2-3/4*I*c^3*d^3*a^2*b*arctan(c*x)*x^4+9/2*I*c*d^3*a^2*b*arctan(
c*x)*x^2-1/4/c*d^3*b^3+3*I/c*d^3*b^3*Pi*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))
*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*arctan(c*x)^2+3/2*I/c*d^3*b^3*Pi*csgn(I/
((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/
(c^2*x^2+1)+1)^2)^2*arctan(c*x)^2-3/2*I/c*d^3*b^3*Pi*csgn(I*(1+I*c*x)/(c^2*
x^2+1)^(1/2))^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*arctan(c*x)^2+3/2*I/c*d^3*b
^3*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*
c*x)^2/(c^2*x^2+1)+1)^2)^2*arctan(c*x)^2-3*I/c*d^3*b^3*Pi*csgn(I*((1+I*c*x)
^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*arctan(c*x)^2+3/
2*I/c*d^3*b^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/
(c^2*x^2+1)+1)^2)*arctan(c*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^3*(a+b*arctan(c*x))^3,x, algorithm="maxima")
```

```
[Out] -1/4*I*a^3*c^3*d^3*x^4 - 24*b^3*c^5*d^3*integrate(1/128*x^5*arctan(c*x)^2*l
og(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + 2*b^3*c^5*d^3*integrate(1/128*x^5*log(c
^2*x^2 + 1)^3/(c^2*x^2 + 1), x) - 12*b^3*c^5*d^3*integrate(1/128*x^5*arctan
(c*x)^2/(c^2*x^2 + 1), x) + 3*b^3*c^5*d^3*integrate(1/128*x^5*log(c^2*x^2 +
 1)^2/(c^2*x^2 + 1), x) - a^3*c^2*d^3*x^3 - 336*b^3*c^4*d^3*integrate(1/128
*x^4*arctan(c*x)^3/(c^2*x^2 + 1), x) - 36*b^3*c^4*d^3*integrate(1/128*x^4*a
rctan(c*x)*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) - 1152*a*b^2*c^4*d^3*integr
ate(1/128*x^4*arctan(c*x)^2/(c^2*x^2 + 1), x) - 60*b^3*c^4*d^3*integrate(1/
128*x^4*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) - 1/4*I*(3*x^4*arcta
n(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*a^2*b*c^3*d^3 + 48*b^
3*c^3*d^3*integrate(1/128*x^3*arctan(c*x)^2*log(c^2*x^2 + 1)/(c^2*x^2 + 1),
 x) - 4*b^3*c^3*d^3*integrate(1/128*x^3*log(c^2*x^2 + 1)^3/(c^2*x^2 + 1), x
) + 120*b^3*c^3*d^3*integrate(1/128*x^3*arctan(c*x)^2/(c^2*x^2 + 1), x) - 3
0*b^3*c^3*d^3*integrate(1/128*x^3*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) - 3/
2*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a^2*b*c^2*d^3 +
3/2*I*a^3*c*d^3*x^2 + 7/32*b^3*d^3*arctan(c*x)^4/c - 224*b^3*c^2*d^3*integr
ate(1/128*x^2*arctan(c*x)^3/(c^2*x^2 + 1), x) - 24*b^3*c^2*d^3*integrate(1/
```

```
128*x^2*arctan(c*x)*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) - 768*a*b^2*c^2*d^
3*integrate(1/128*x^2*arctan(c*x)^2/(c^2*x^2 + 1), x) + 120*b^3*c^2*d^3*int
egrate(1/128*x^2*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + 9/2*I*(x^
2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a^2*b*c*d^3 + a*b^2*d^3*arctan
(c*x)^3/c + 72*b^3*c*d^3*integrate(1/128*x*arctan(c*x)^2*log(c^2*x^2 + 1)/(
c^2*x^2 + 1), x) - 6*b^3*c*d^3*integrate(1/128*x*log(c^2*x^2 + 1)^3/(c^2*x^
2 + 1), x) - 48*b^3*c*d^3*integrate(1/128*x*arctan(c*x)^2/(c^2*x^2 + 1), x)
 + 12*b^3*c*d^3*integrate(1/128*x*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + a^
3*d^3*x + 12*b^3*d^3*integrate(1/128*arctan(c*x)*log(c^2*x^2 + 1)^2/(c^2*x^
2 + 1), x) + 3/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*a^2*b*d^3/c + 1/256
*(-8*I*b^3*c^3*d^3*x^4 - 32*b^3*c^2*d^3*x^3 + 48*I*b^3*c*d^3*x^2 + 32*b^3*d
^3*x)*arctan(c*x)^3 + 1/256*(12*b^3*c^3*d^3*x^4 - 48*I*b^3*c^2*d^3*x^3 - 72
*b^3*c*d^3*x^2 + 48*I*b^3*d^3*x)*arctan(c*x)^2*log(c^2*x^2 + 1) + 1/256*(6*
I*b^3*c^3*d^3*x^4 + 24*b^3*c^2*d^3*x^3 - 36*I*b^3*c*d^3*x^2 - 24*b^3*d^3*x)
*arctan(c*x)*log(c^2*x^2 + 1)^2 - 1/256*(b^3*c^3*d^3*x^4 - 4*I*b^3*c^2*d^3*
x^3 - 6*b^3*c*d^3*x^2 + 4*I*b^3*d^3*x)*log(c^2*x^2 + 1)^3 - I*integrate(1/1
28*(112*(b^3*c^5*d^3*x^5 - 2*b^3*c^3*d^3*x^3 - 3*b^3*c*d^3*x)*arctan(c*x)^3
 + 2*(3*b^3*c^4*d^3*x^4 + 2*b^3*c^2*d^3*x^2 - b^3*d^3)*log(c^2*x^2 + 1)^3 +
 12*(32*a*b^2*c^5*d^3*x^5 - 5*b^3*c^4*d^3*x^4 - 64*a*b^2*c^3*d^3*x^3 + 10*b
^3*c^2*d^3*x^2 - 96*a*b^2*c*d^3*x)*arctan(c*x)^2 + 3*(5*b^3*c^4*d^3*x^4 - 1
0*b^3*c^2*d^3*x^2 + 4*(b^3*c^5*d^3*x^5 - 2*b^3*c^3*d^3*x^3 - 3*b^3*c*d^3*x)
*arctan(c*x))*log(c^2*x^2 + 1)^2 - 12*(2*(3*b^3*c^4*d^3*x^4 + 2*b^3*c^2*d^3
*x^2 - b^3*d^3)*arctan(c*x)^2 - (b^3*c^5*d^3*x^5 - 10*b^3*c^3*d^3*x^3 + 4*b
^3*c*d^3*x)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{atan}\,(c\,x))^3\,(d+c\,d\,x\,1\mathrm{i})^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3*(d + c*d*x*1i)^3,x)
[Out] int((a + b*atan(c*x))^3*(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**3*(a+b*atan(c*x))**3,x)
[Out] Timed out
```

3.121 $\int (d+icdx)^2 \left(a+b\tan^{-1}(cx)\right)^3 \, dx$

Optimal. Leaf size=298

$$-\frac{4ib^2d^2\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}-\frac{6ib^2d^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}-ab^2d^2x+\frac{1}{2}bcd^2x^2\left(a+b\tan^{-1}(c\right.$$

```
[Out] -a*b^2*d^2*x-b^3*d^2*x*arctan(c*x)+7/2*b*d^2*(a+b*arctan(c*x))^2/c-3*I*b*d^
2*x*(a+b*arctan(c*x))^2+1/2*b*c*d^2*x^2*(a+b*arctan(c*x))^2-1/3*I*d^2*(1+I*
c*x)^3*(a+b*arctan(c*x))^3/c+4*b*d^2*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/c-
6*I*b^2*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c+1/2*b^3*d^2*ln(c^2*x^2+1)/c
-4*I*b^2*d^2*(a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/c+3*b^3*d^2*polylog
(2,1-2/(1+I*c*x))/c+2*b^3*d^2*polylog(3,1-2/(1-I*c*x))/c
```

Rubi [A] time = 0.48, antiderivative size = 298, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 13, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.591$, Rules used = {4864, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 260, 4884, 1586, 4992, 6610}

$$-\frac{4ib^2d^2\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}+\frac{3b^3d^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c}+\frac{2b^3d^2\text{PolyLog}\left(3,1-\frac{2}{1-icx}\right)}{c}-$$

Antiderivative was successfully verified.

```
[In] Int[(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^3,x]
```

```
[Out] -(a*b^2*d^2*x) - b^3*d^2*x*ArcTan[c*x] + (7*b*d^2*(a + b*ArcTan[c*x])^2)/(2
*c) - (3*I)*b*d^2*x*(a + b*ArcTan[c*x])^2 + (b*c*d^2*x^2*(a + b*ArcTan[c*x]
)^2)/2 - ((I/3)*d^2*(1 + I*c*x)^3*(a + b*ArcTan[c*x])^3)/c + (4*b*d^2*(a +
b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/c - ((6*I)*b^2*d^2*(a + b*ArcTan[c*x])
*Log[2/(1 + I*c*x)])/c + (b^3*d^2*Log[1 + c^2*x^2])/(2*c) - ((4*I)*b^2*d^2*
(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/c + (3*b^3*d^2*PolyLog[2
, 1 - 2/(1 + I*c*x)])/c + (2*b^3*d^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/c
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] :> Int[u*PolynomialQuotient[Px
, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] &&
 EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (d+icdx)^2 \left(a+b\tan^{-1}(cx)\right)^3 \, dx = -\frac{id^2(1+icx)^3 \left(a+b\tan^{-1}(cx)\right)^3}{3c} + \frac{(ib)\int \left(-3d^3 \left(a+b\tan^{-1}(cx)\right)^2 - ic\right.}{}$$

$$= -\frac{id^2(1+icx)^3 \left(a+b\tan^{-1}(cx)\right)^3}{3c} + \frac{(4b)\int \frac{\left(id^3-cd^3x\right)\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}\,dx}{d} - (3$$

$$= -3ibd^2x \left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{2}bcd^2x^2 \left(a+b\tan^{-1}(cx)\right)^2 - \frac{id^2(1+icx)^3}{}$$

$$= \frac{3bd^2 \left(a+b\tan^{-1}(cx)\right)^2}{c} - 3ibd^2x \left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{2}bcd^2x^2 \left(a+b\,\mathrm{ta}\right.$$

$$= -ab^2d^2x + \frac{7bd^2 \left(a+b\tan^{-1}(cx)\right)^2}{2c} - 3ibd^2x \left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{2}bcd^2$$

$$= -ab^2d^2x - b^3d^2x\tan^{-1}(cx) + \frac{7bd^2 \left(a+b\tan^{-1}(cx)\right)^2}{2c} - 3ibd^2x \left(a+b\,\mathrm{ta}\right.$$

$$= -ab^2d^2x - b^3d^2x\tan^{-1}(cx) + \frac{7bd^2 \left(a+b\tan^{-1}(cx)\right)^2}{2c} - 3ibd^2x \left(a+b\,\mathrm{ta}\right.$$

Mathematica [A] time = 1.07, size = 528, normalized size = 1.77

$$-\frac{d^2 \left(2a^3c^3x^3 - 6ia^3c^2x^2 - 6a^3cx + 6a^2bc^3x^3\tan^{-1}(cx) - 3a^2bc^2x^2 + 12a^2b\log\left(c^2x^2+1\right) - 18ia^2bc^2x^2\tan^{-1}(c\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + I*c*d*x)^2*(a + b*ArcTan[c*x])^3,x]
```

```
[Out] -1/6*(d^2*(-6*a^3*c*x + (18*I)*a^2*b*c*x + 6*a*b^2*c*x - (6*I)*a^3*c^2*x^2
- 3*a^2*b*c^2*x^2 + 2*a^3*c^3*x^3 - (18*I)*a^2*b*ArcTan[c*x] - 6*a*b^2*ArcT
an[c*x] - 18*a^2*b*c*x*ArcTan[c*x] + (36*I)*a*b^2*c*x*ArcTan[c*x] + 6*b^3*c
*x*ArcTan[c*x] - (18*I)*a^2*b*c^2*x^2*ArcTan[c*x] - 6*a*b^2*c^2*x^2*ArcTan[
c*x] + 6*a^2*b*c^3*x^3*ArcTan[c*x] + (6*I)*a*b^2*ArcTan[c*x]^2 + 15*b^3*Arc
Tan[c*x]^2 - 18*a*b^2*c*x*ArcTan[c*x]^2 + (18*I)*b^3*c*x*ArcTan[c*x]^2 - (1
8*I)*a*b^2*c^2*x^2*ArcTan[c*x]^2 - 3*b^3*c^2*x^2*ArcTan[c*x]^2 + 6*a*b^2*c^
3*x^3*ArcTan[c*x]^2 + (2*I)*b^3*ArcTan[c*x]^3 - 6*b^3*c*x*ArcTan[c*x]^3 - (
6*I)*b^3*c^2*x^2*ArcTan[c*x]^3 + 2*b^3*c^3*x^3*ArcTan[c*x]^3 - 48*a*b^2*Arc
Tan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + (36*I)*b^3*ArcTan[c*x]*Log[1 + E^
((2*I)*ArcTan[c*x])] - 24*b^3*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])]
+ 12*a^2*b*Log[1 + c^2*x^2] - (18*I)*a*b^2*Log[1 + c^2*x^2] - 3*b^3*Log[1 +
 c^2*x^2] + 6*b^2*((4*I)*a + 3*b + (4*I)*b*ArcTan[c*x])*PolyLog[2, -E^((2*I
)*ArcTan[c*x])] - 12*b^3*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/c
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\frac{1}{24}\left(i\,b^3c^2d^2x^3 + 3\,b^3cd^2x^2 - 3i\,b^3d^2x\right)\log\left(-\frac{cx+i}{cx-i}\right)^3 + \mathrm{integral}\left(-\frac{4\,a^3c^4d^2x^4 - 8i\,a^3c^3d^2x^3 - 8i\,a^3cd^2x - 4\,a^3c}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^3,x, algorithm="fricas")
```

```
[Out] 1/24*(I*b^3*c^2*d^2*x^3 + 3*b^3*c*d^2*x^2 - 3*I*b^3*d^2*x)*log(-(c*x + I)/(
c*x - I))^3 + integral(-1/4*(4*a^3*c^4*d^2*x^4 - 8*I*a^3*c^3*d^2*x^3 - 8*I*
a^3*c*d^2*x - 4*a^3*d^2 - (3*a*b^2*c^4*d^2*x^4 + 3*I*b^3*c^2*d^2*x^2 + (-6*
I*a*b^2 - b^3)*c^3*d^2*x^3 - 3*a*b^2*d^2 - 3*(2*I*a*b^2 - b^3)*c*d^2*x)*log
(-(c*x + I)/(c*x - I))^2 - (-6*I*a^2*b*c^4*d^2*x^4 - 12*a^2*b*c^3*d^2*x^3 -
 12*a^2*b*c*d^2*x + 6*I*a^2*b*d^2)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2 + 1)
, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 6.23, size = 1815, normalized size = 6.09

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)^2*(a+b*arctan(c*x))^3,x)
```

```
[Out] -5/2/c*d^2*b^3*arctan(c*x)^2-6/c*d^2*b^3*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1
/2))-1/3*I/c*d^2*a^3-1/3*c^2*x^3*a^3*d^2-1/c*d^2*b^3*ln((1+I*c*x)^2/(c^2*x^
2+1)+1)-6/c*d^2*b^3*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-a*b^2*d^2*x-b^3*
d^2*x*arctan(c*x)-4/c*a*b^2*arctan(c*x)*ln(c^2*x^2+1)*d^2-2/c*b^3*arctan(c*
x)^2*ln(c^2*x^2+1)*d^2+4/c*b^3*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))*arctan(c*x)^
2*d^2+4/c*b^3*d^2*ln(2)*arctan(c*x)^2-2/c*a^2*b*ln(c^2*x^2+1)*d^2+3*a*b^2*a
rctan(c*x)^2*x*d^2+3*a^2*b*arctan(c*x)*x*d^2-c^2*d^2*a^2*b*arctan(c*x)*x^3+
I*c*d^2*b^3*arctan(c*x)^3*x^2+I/c*d^2*a*b^2*ln(c*x-I)^2-6*I*d^2*a*b^2*arcta
n(c*x)*x+3*I/c*d^2*a^2*b*arctan(c*x)+3*I/c*d^2*a*b^2*arctan(c*x)^2-I/c*d^2*
a*b^2*ln(I+c*x)^2+3*I/c*d^2*a*b^2*ln(c^2*x^2+1)-2*I/c*d^2*a*b^2*dilog(1/2*I
*(c*x-I))+2*I/c*d^2*a*b^2*dilog(-1/2*I*(I+c*x))-6*I/c*d^2*b^3*arctan(c*x)*l
n(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*I/c*d^2*b^3*arctan(c*x)*ln(1-I*(1+I*c*
x)/(c^2*x^2+1)^(1/2))-4*I/c*d^2*b^3*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2
*x^2+1))+c*d^2*a*b^2*arctan(c*x)*x^2-c^2*d^2*a*b^2*arctan(c*x)^2*x^3-I/c*d^
2*b^3*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+
1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*arctan(c*
x)^2-1/3*I/c*d^2*b^3*arctan(c*x)^3-3*I*d^2*b^3*arctan(c*x)^2*x-3*I*d^2*a^2*
b*x+1/2*c*d^2*a^2*b*x^2+I/c*d^2*b^3*arctan(c*x)+1/c*d^2*a*b^2*arctan(c*x)+1
/2*c*d^2*b^3*arctan(c*x)^2*x^2-1/3*c^2*d^2*b^3*arctan(c*x)^3*x^3+I*c*x^2*a^
3*d^2+b^3*arctan(c*x)^3*x*d^2+2/c*b^3*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))*d
^2+I/c*d^2*b^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*arctan(c*x)^2+2*I
/c*d^2*a*b^2*ln(I+c*x)*ln(c^2*x^2+1)+3*I*c*d^2*a^2*b*arctan(c*x)*x^2+3*I*c*
d^2*a*b^2*arctan(c*x)^2*x^2-2*I/c*d^2*a*b^2*ln(c*x-I)*ln(c^2*x^2+1)-2*I/c*d
^2*a*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))+2*I/c*d^2*a*b^2*ln(c*x-I)*ln(-1/2*I*(I
+c*x))-I/c*d^2*b^3*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*arctan(c*x)^2-I/c*d
^2*b^3*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*a
rctan(c*x)^2+I/c*d^2*b^3*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1
+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*arctan(c*x)^2+I/c*d^
2*b^3*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1
+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*arctan(c*x)^2+I/c*d^2*b^3*Pi*csgn(I*((1+I*c*x
)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*arctan(c*x)^2-2
*I/c*d^2*b^3*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^
2*x^2+1)+1)^2)^2*arctan(c*x)^2+2*I/c*d^2*b^3*Pi*csgn(I*(1+I*c*x)/(c^2*x^2+1
)^(1/2))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*arctan(c*x)^2-I/c*d^2*b^3*Pi*csg
n(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*arctan(c
*x)^2+a^3*x*d^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)^2*(a+b*arctan(c*x))^3,x, algorithm="maxima")
```

```
[Out] -1/3*a^3*c^2*d^2*x^3 - 28*b^3*c^4*d^2*integrate(1/32*x^4*arctan(c*x)^3/(c^2
*x^2 + 1), x) - 3*b^3*c^4*d^2*integrate(1/32*x^4*arctan(c*x)*log(c^2*x^2 +
1)^2/(c^2*x^2 + 1), x) - 96*a*b^2*c^4*d^2*integrate(1/32*x^4*arctan(c*x)^2/
(c^2*x^2 + 1), x) - 4*b^3*c^4*d^2*integrate(1/32*x^4*arctan(c*x)*log(c^2*x^
2 + 1)/(c^2*x^2 + 1), x) + 12*b^3*c^3*d^2*integrate(1/32*x^3*arctan(c*x)^2*
log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) - b^3*c^3*d^2*integrate(1/32*x^3*log(c^2
*x^2 + 1)^3/(c^2*x^2 + 1), x) + 16*b^3*c^3*d^2*integrate(1/32*x^3*arctan(c*
x)^2/(c^2*x^2 + 1), x) - 4*b^3*c^3*d^2*integrate(1/32*x^3*log(c^2*x^2 + 1)^
2/(c^2*x^2 + 1), x) - 1/2*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1
)/c^4))*a^2*b*c^2*d^2 + I*a^3*c*d^2*x^2 + 7/32*b^3*d^2*arctan(c*x)^4/c + 24
*b^3*c^2*d^2*integrate(1/32*x^2*arctan(c*x)*log(c^2*x^2 + 1)/(c^2*x^2 + 1),
 x) + 3*I*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a^2*b*c*d^2 + a*b
^2*d^2*arctan(c*x)^3/c + 12*b^3*c*d^2*integrate(1/32*x*arctan(c*x)^2*log(c^
2*x^2 + 1)/(c^2*x^2 + 1), x) - b^3*c*d^2*integrate(1/32*x*log(c^2*x^2 + 1)^
3/(c^2*x^2 + 1), x) - 12*b^3*c*d^2*integrate(1/32*x*arctan(c*x)^2/(c^2*x^2
+ 1), x) + 3*b^3*c*d^2*integrate(1/32*x*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x
) + a^3*d^2*x + 3*b^3*d^2*integrate(1/32*arctan(c*x)*log(c^2*x^2 + 1)^2/(c^
2*x^2 + 1), x) + 3/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*a^2*b*d^2/c - 1
/192*(8*b^3*c^2*d^2*x^3 - 24*I*b^3*c*d^2*x^2 - 24*b^3*d^2*x)*arctan(c*x)^3
- 1/192*(12*I*b^3*c^2*d^2*x^3 + 36*b^3*c*d^2*x^2 - 36*I*b^3*d^2*x)*arctan(c
*x)^2*log(c^2*x^2 + 1) + 1/192*(6*b^3*c^2*d^2*x^3 - 18*I*b^3*c*d^2*x^2 - 18
*b^3*d^2*x)*arctan(c*x)*log(c^2*x^2 + 1)^2 - 1/192*(-I*b^3*c^2*d^2*x^3 - 3*
b^3*c*d^2*x^2 + 3*I*b^3*d^2*x)*log(c^2*x^2 + 1)^3 - I*integrate(-1/64*(112*
(b^3*c^3*d^2*x^3 + b^3*c*d^2*x)*arctan(c*x)^3 - (b^3*c^4*d^2*x^4 - b^3*d^2)
*log(c^2*x^2 + 1)^3 + 8*(b^3*c^4*d^2*x^4 + 48*a*b^2*c^3*d^2*x^3 - 6*b^3*c^2
*d^2*x^2 + 48*a*b^2*c*d^2*x)*arctan(c*x)^2 - 2*(b^3*c^4*d^2*x^4 - 6*b^3*c^2
*d^2*x^2 - 6*(b^3*c^3*d^2*x^3 + b^3*c*d^2*x)*arctan(c*x))*log(c^2*x^2 + 1)^
2 + 4*(3*(b^3*c^4*d^2*x^4 - b^3*d^2)*arctan(c*x)^2 + 2*(4*b^3*c^3*d^2*x^3 -
 3*b^3*c*d^2*x)*arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{atan}\,(c\,x))^3\,(d + c\,d\,x\,1\mathrm{i})^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3*(d + c*d*x*1i)^2,x)
```

```
[Out] int((a + b*atan(c*x))^3*(d + c*d*x*1i)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)**2*(a+b*atan(c*x))**3,x)
```

```
[Out] Timed out
```

3.122 $\int (d+icdx)\left(a+b\tan^{-1}(cx)\right)^3\,dx$

Optimal. Leaf size=220

$$-\frac{3ib^2d\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}-\frac{3ib^2d\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}+\frac{3bd\left(a+b\tan^{-1}(cx)\right)^2}{2c}-\frac{3}{2}ibdx\left(a+b\right.$$

[Out] 3/2*b*d*(a+b*arctan(c*x))^2/c-3/2*I*b*d*x*(a+b*arctan(c*x))^2-1/2*I*d*(1+I*c*x)^2*(a+b*arctan(c*x))^3/c+3*b*d*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/c-3*I*b^2*d*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c-3*I*b^2*d*(a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/c+3/2*b^3*d*polylog(2,1-2/(1+I*c*x))/c+3/2*b^3*d*polylog(3,1-2/(1-I*c*x))/c

Rubi [A] time = 0.34, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4864, 4846, 4920, 4854, 2402, 2315, 1586, 4884, 4992, 6610}

$$-\frac{3ib^2d\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c}+\frac{3b^3d\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{2c}+\frac{3b^3d\text{PolyLog}\left(3,1-\frac{2}{1-icx}\right)}{2c}-\frac{3ib^2d}{}$$

Antiderivative was successfully verified.

[In] Int[(d + I*c*d*x)*(a + b*ArcTan[c*x])^3,x]

[Out] (3*b*d*(a + b*ArcTan[c*x])^2)/(2*c) - ((3*I)/2)*b*d*x*(a + b*ArcTan[c*x])^2 - ((I/2)*d*(1 + I*c*x)^2*(a + b*ArcTan[c*x])^3)/c + (3*b*d*(a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/c - ((3*I)*b^2*d*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c - ((3*I)*b^2*d*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/c + (3*b^3*d*PolyLog[2, 1 - 2/(1 + I*c*x)])/(2*c) + (3*b^3*d*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*c)

Rule 1586

```
Int[(u_.)*(Px_)^(p_.)*(Qx_)^(q_.), x_Symbol] :> Int[u*PolynomialQuotient[Px, Qx, x]^p*Qx^(p + q), x] /; FreeQ[q, x] && PolyQ[Px, x] && PolyQ[Qx, x] && EqQ[PolynomialRemainder[Px, Qx, x], 0] && IntegerQ[p] && LtQ[p*q, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 - c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dist[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*ArcTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
```

```
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int (d+icdx)\left(a+b\tan^{-1}(cx)\right)^3\,dx = -\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^3}{2c}+\frac{(3ib)\int\left(-d^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{2i\left(id^2-cd\right.}{}\right.}{2d}$$

$$=-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^3}{2c}+\frac{(3b)\int\frac{\left(id^2-cd^2x\right)\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}dx}{d}-\frac{1}{2}(3ibd$$

$$=-\frac{3}{2}ibdx\left(a+b\tan^{-1}(cx)\right)^2-\frac{id(1+icx)^2\left(a+b\tan^{-1}(cx)\right)^3}{2c}+\frac{(3b)\int\frac{\left(a+b\tan\right.}{-\frac{i}{d^2}}}{d}$$

$$=\frac{3bd\left(a+b\tan^{-1}(cx)\right)^2}{2c}-\frac{3}{2}ibdx\left(a+b\tan^{-1}(cx)\right)^2-\frac{id(1+icx)^2\left(a+b\tan^{-}\right.}{2c}$$

$$=\frac{3bd\left(a+b\tan^{-1}(cx)\right)^2}{2c}-\frac{3}{2}ibdx\left(a+b\tan^{-1}(cx)\right)^2-\frac{id(1+icx)^2\left(a+b\tan^{-}\right.}{2c}$$

$$=\frac{3bd\left(a+b\tan^{-1}(cx)\right)^2}{2c}-\frac{3}{2}ibdx\left(a+b\tan^{-1}(cx)\right)^2-\frac{id(1+icx)^2\left(a+b\tan^{-}\right.}{2c}$$

$$=\frac{3bd\left(a+b\tan^{-1}(cx)\right)^2}{2c}-\frac{3}{2}ibdx\left(a+b\tan^{-1}(cx)\right)^2-\frac{id(1+icx)^2\left(a+b\tan^{-}\right.}{2c}$$

<u>**Mathematica**</u> **[A]** time = 0.49, size = 367, normalized size = 1.67

$$\frac{id\left(a^3c^2x^2-2ia^3cx+3ia^2b\log\left(c^2x^2+1\right)+3a^2bc^2x^2\tan^{-1}(cx)-3a^2bcx+3a^2b\tan^{-1}(cx)-6ia^2bcx\tan^{-1}(cx)+\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + I*c*d*x)*(a + b*ArcTan[c*x])^3,x]
```

```
[Out] ((I/2)*d*((-2*I)*a^3*c*x - 3*a^2*b*c*x + a^3*c^2*x^2 + 3*a^2*b*ArcTan[c*x]
- (6*I)*a^2*b*c*x*ArcTan[c*x] - 6*a*b^2*c*x*ArcTan[c*x] + 3*a^2*b*c^2*x^2*A
rcTan[c*x] - 3*a*b^2*ArcTan[c*x]^2 + (3*I)*b^3*ArcTan[c*x]^2 - (6*I)*a*b^2*
c*x*ArcTan[c*x]^2 - 3*b^3*c*x*ArcTan[c*x]^2 + 3*a*b^2*c^2*x^2*ArcTan[c*x]^2
 - b^3*ArcTan[c*x]^3 - (2*I)*b^3*c*x*ArcTan[c*x]^3 + b^3*c^2*x^2*ArcTan[c*x
]^3 - (12*I)*a*b^2*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - 6*b^3*ArcTa
n[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - (6*I)*b^3*ArcTan[c*x]^2*Log[1 + E^(
(2*I)*ArcTan[c*x])] + (3*I)*a^2*b*Log[1 + c^2*x^2] + 3*a*b^2*Log[1 + c^2*x^
2] - 3*b^2*(2*a - I*b + 2*b*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])]
 - (3*I)*b^3*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/c
```

<u>**fricas**</u> **[F]** time = 0.55, size = 0, normalized size = 0.00

$$\frac{1}{16}\left(b^3cdx^2-2i\,b^3dx\right)\log\left(-\frac{cx+i}{cx-i}\right)^3+\text{integral}\left(\frac{8i\,a^3c^3dx^3+8\,a^3c^2dx^2+8i\,a^3cdx+8\,a^3d+\left(-6i\,ab^2c^3dx^3-\left(6\,a\right.\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^3,x, algorithm="fricas")
```

```
[Out] 1/16*(b^3*c*d*x^2 - 2*I*b^3*d*x)*log(-(c*x + I)/(c*x - I))^3 + integral(1/8
*(8*I*a^3*c^3*d*x^3 + 8*a^3*c^2*d*x^2 + 8*I*a^3*c*d*x + 8*a^3*d + (-6*I*a*b
^2*c^3*d*x^3 - (6*a*b^2 - 3*I*b^3)*c^2*d*x^2 - 6*a*b^2*d - 6*(I*a*b^2 - b^3
)*c*d*x)*log(-(c*x + I)/(c*x - I))^2 - (12*a^2*b*c^3*d*x^3 - 12*I*a^2*b*c^2
```

```
*d*x^2 + 12*a^2*b*c*d*x - 12*I*a^2*b*d)*log(-(c*x + I)/(c*x - I)))/(c^2*x^2
 + 1), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 2.54, size = 7451, normalized size = 33.87

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d+I*c*d*x)*(a+b*arctan(c*x))^3,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*arctan(c*x))^3,x, algorithm="maxima")
```

```
[Out] 12*b^3*c^3*d*integrate(1/64*x^3*arctan(c*x)^2*log(c^2*x^2 + 1)/(c^2*x^2 + 1
), x) - b^3*c^3*d*integrate(1/64*x^3*log(c^2*x^2 + 1)^3/(c^2*x^2 + 1), x) +
 12*b^3*c^3*d*integrate(1/64*x^3*arctan(c*x)^2/(c^2*x^2 + 1), x) - 3*b^3*c^
3*d*integrate(1/64*x^3*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + 1/2*I*a^3*c*d
*x^2 + 7/32*b^3*d*arctan(c*x)^4/c + 56*b^3*c^2*d*integrate(1/64*x^2*arctan(
c*x)^3/(c^2*x^2 + 1), x) + 6*b^3*c^2*d*integrate(1/64*x^2*arctan(c*x)*log(c
^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + 192*a*b^2*c^2*d*integrate(1/64*x^2*arctan
(c*x)^2/(c^2*x^2 + 1), x) + 36*b^3*c^2*d*integrate(1/64*x^2*arctan(c*x)*log
(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + 3/2*I*(x^2*arctan(c*x) - c*(x/c^2 - arcta
n(c*x)/c^3))*a^2*b*c*d + a*b^2*d*arctan(c*x)^3/c + 12*b^3*c*d*integrate(1/6
4*x*arctan(c*x)^2*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) - b^3*c*d*integrate(1/
64*x*log(c^2*x^2 + 1)^3/(c^2*x^2 + 1), x) - 24*b^3*c*d*integrate(1/64*x*arc
tan(c*x)^2/(c^2*x^2 + 1), x) + 6*b^3*c*d*integrate(1/64*x*log(c^2*x^2 + 1)^
2/(c^2*x^2 + 1), x) + a^3*d*x + 6*b^3*d*integrate(1/64*arctan(c*x)*log(c^2*
x^2 + 1)^2/(c^2*x^2 + 1), x) + 3/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*a
^2*b*d/c - 1/128*(-8*I*b^3*c*d*x^2 - 16*b^3*d*x)*arctan(c*x)^3 - 3/32*(b^3*
c*d*x^2 - 2*I*b^3*d*x)*arctan(c*x)^2*log(c^2*x^2 + 1) - 1/128*(6*I*b^3*c*d*
x^2 + 12*b^3*d*x)*arctan(c*x)*log(c^2*x^2 + 1)^2 + 1/128*(b^3*c*d*x^2 - 2*I
*b^3*d*x)*log(c^2*x^2 + 1)^3 + I*integrate(1/64*(56*(b^3*c^3*d*x^3 + b^3*c*
d*x)*arctan(c*x)^3 + (b^3*c^2*d*x^2 + b^3*d)*log(c^2*x^2 + 1)^3 + 12*(16*a*
b^2*c^3*d*x^3 - 3*b^3*c^2*d*x^2 + 16*a*b^2*c*d*x)*arctan(c*x)^2 + 3*(3*b^3*
c^2*d*x^2 + 2*(b^3*c^3*d*x^3 + b^3*c*d*x)*arctan(c*x))*log(c^2*x^2 + 1)^2 -
 12*((b^3*c^2*d*x^2 + b^3*d)*arctan(c*x)^2 - (b^3*c^3*d*x^3 - 2*b^3*c*d*x)*
arctan(c*x))*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{atan}\left(c\,x\right))^3\,\left(d+c\,d\,x\,1{}\mathrm{i}\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3*(d + c*d*x*1i),x)
```

```
[Out] int((a + b*atan(c*x))^3*(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d+I*c*d*x)*(a+b*atan(c*x))**3,x)
```

```
[Out] Timed out
```

3.123 $\int \frac{(a+b\tan^{-1}(cx))^3}{d+icdx}\,dx$

Optimal. Leaf size=139

$$\frac{3ib^2\text{Li}_3\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{3b\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)^2}{2cd}+\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^3}{cd}+\frac{3b}{}$$

```
[Out] I*(a+b*arctan(c*x))^3*ln(2/(1+I*c*x))/c/d-3/2*b*(a+b*arctan(c*x))^2*polylog
(2,1-2/(1+I*c*x))/c/d+3/2*I*b^2*(a+b*arctan(c*x))*polylog(3,1-2/(1+I*c*x))/
c/d+3/4*b^3*polylog(4,1-2/(1+I*c*x))/c/d
```

Rubi [A] time = 0.23, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.227$, Rules used = {4854, 4884, 4994, 4998, 6610}

$$\frac{3ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{3b\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{2cd}+\frac{3b^3\text{PolyLog}\left(4,1\right.}{4cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(d + I*c*d*x),x]
```

```
[Out] (I*(a + b*ArcTan[c*x])^3*Log[2/(1 + I*c*x)])/(c*d) - (3*b*(a + b*ArcTan[c*x
])^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(2*c*d) + (((3*I)/2)*b^2*(a + b*ArcTan[
c*x])*PolyLog[3, 1 - 2/(1 + I*c*x)])/(c*d) + (3*b^3*PolyLog[4, 1 - 2/(1 + I
*c*x)])/(4*c*d)
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{(3ib)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{1+c^2x^2}dx}{d}$$
$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2\mathrm{Li}_2\left(1-\frac{2}{1+icx}\right)}{2cd} + \frac{\left(3b^2\right)\int \frac{(a+b\text{t}}{}}{}$$
$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2\mathrm{Li}_2\left(1-\frac{2}{1+icx}\right)}{2cd} + \frac{3ib^2\left(a+b\,\text{ta}\right.}{}$$
$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2\mathrm{Li}_2\left(1-\frac{2}{1+icx}\right)}{2cd} + \frac{3ib^2\left(a+b\,\text{ta}\right.}{}$$

Mathematica [A] time = 0.09, size = 133, normalized size = 0.96

$$\frac{i\left(4\log\left(\frac{2d}{d+icdx}\right)\left(a+b\tan^{-1}(cx)\right)^3+3ib\left(2\mathrm{Li}_2\left(\frac{cx+i}{cx-i}\right)\left(a+b\tan^{-1}(cx)\right)^2-b\left(2i\mathrm{Li}_3\left(\frac{cx+i}{cx-i}\right)\left(a+b\tan^{-1}(cx)\right)+b\mathrm{Li}_4\right.\right.\right.}{4cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(d + I*c*d*x),x]
```

```
[Out] ((I/4)*(4*(a + b*ArcTan[c*x])^3*Log[(2*d)/(d + I*c*d*x)] + (3*I)*b*(2*(a +
b*ArcTan[c*x])^2*PolyLog[2, (I + c*x)/(-I + c*x)] - b*((2*I)*(a + b*ArcTan[
c*x])*PolyLog[3, (I + c*x)/(-I + c*x)] + b*PolyLog[4, (I + c*x)/(-I + c*x)]
))))/(c*d)
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(-\frac{b^3\log\left(-\frac{cx+i}{cx-i}\right)^3-6i\,ab^2\log\left(-\frac{cx+i}{cx-i}\right)^2-12\,a^2b\log\left(-\frac{cx+i}{cx-i}\right)+8i\,a^3}{8\,cdx-8i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral(-(b^3*log(-(c*x + I)/(c*x - I))^3 - 6*I*a*b^2*log(-(c*x + I)/(c*x
- I))^2 - 12*a^2*b*log(-(c*x + I)/(c*x - I)) + 8*I*a^3)/(8*c*d*x - 8*I*d),
x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.50, size = 2044, normalized size = 14.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^3/(d+I*c*d*x),x)
```

```
[Out] -3/2/c*a*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2
*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2/c*a*b^2/d*Pi*csgn(
(1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2
+1)+1))^2*arctan(c*x)^2+3/2/c*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I
*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^
2+1)+1))^2*arctan(c*x)^2+1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*
c*x)^2/(c^2*x^2+1)+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2
/(c^2*x^2+1))*arctan(c*x)^3-3/2/c*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/(
(1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))*arctan(c*x)^2+2/c*a*b^2/d*arctan(c*x)^3+3/2/c*a^2*b/d*dilog(1/
2*I*c*x+1/2)+3/2/c*b^3/d*arctan(c*x)^2*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+
3/4/c*a^2*b/d*ln(1+I*c*x)^2+1/2/c*b^3/d*Pi*arctan(c*x)^3-1/2*I/c*a^3/d*ln(c
^2*x^2+1)+1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2
+1)+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arcta
n(c*x)^3-1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+
1)+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c
*x)^3-1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+
1))^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^3-3/2/c*a*b^2/d*Pi*cs
gn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-3*I
/c*a*b^2/d*ln(1+I*c*x)*arctan(c*x)^2+3*I/c*a*b^2/d*arctan(c*x)^2*ln(2*I*(1+
I*c*x)^2/(c^2*x^2+1))-3*I/c*a^2*b/d*ln(1+I*c*x)*arctan(c*x)+3/2/c*a*b^2/d*P
i*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)
^2-3/2/c*a*b^2/d*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))^2*arctan(c*x)^2+1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))^2*csgn((1+I*c*x)^2/(c^2*x^2+1))*arctan(c*x)^3+3/2/c*a*b^
2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*cs
gn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+1/2/c
*b^3/d*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arc
tan(c*x)^3-1/2/c*b^3/d*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*
x^2+1)+1))^2*arctan(c*x)^3-3/2/c*a^2*b/d*ln(1/2-1/2*I*c*x)*ln(1+I*c*x)+3/2/
c*a^2*b/d*ln(1/2-1/2*I*c*x)*ln(1/2*I*c*x+1/2)+3/2/c*a*b^2/d*Pi*arctan(c*x)^
2-I/c*b^3/d*ln(1+I*c*x)*arctan(c*x)^3+3/2*I/c*b^3/d*arctan(c*x)*polylog(3,-
(1+I*c*x)^2/(c^2*x^2+1))+3/2*I/c*a*b^2/d*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1)
)+3/c*a*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+I/c*b^3/d*arc
tan(c*x)^3*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2/
(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^3-3/4/c*b^3/d*polylo
g(4,-(1+I*c*x)^2/(c^2*x^2+1))+1/2/c*b^3/d*arctan(c*x)^4+1/c*a^3/d*arctan(c*
x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i a^3 \log(i cdx + d)}{cd} + \frac{16 b^3 \arctan(cx)^4 - b^3 \log\left(c^2x^2+1\right)^4 + \left(b^3 c\left(\frac{4 \log\left(c^2dx^2+d\right)\log\left(c^2x^2+1\right)^3}{c^2 d} + \frac{4\left(\log\left(c^2x^2+1\right)^3 + 3\log(c \cdots\right.}{\cdots}\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -I*a^3*log(I*c*d*x + d)/(c*d) + 1/128*(16*b^3*arctan(c*x)^4 + 16*I*b^3*arct
an(c*x)^3*log(c^2*x^2 + 1) + 4*I*b^3*arctan(c*x)*log(c^2*x^2 + 1)^3 - b^3*l
og(c^2*x^2 + 1)^4 + 16*(b^3*arctan(c*x)^4/(c*d) + 8*b^3*c*integrate(1/16*x*
log(c^2*x^2 + 1)^3/(c^2*d*x^2 + d), x) + 8*a*b^2*arctan(c*x)^3/(c*d) + 12*a
^2*b*arctan(c*x)^2/(c*d))*c*d - 128*I*c*d*integrate(1/32*(40*b^3*c*x*arctan
(c*x)^3 + 6*b^3*c*x*arctan(c*x)*log(c^2*x^2 + 1)^2 + 96*a*b^2*c*x*arctan(c*
```

```
x)^2 + 96*a^2*b*c*x*arctan(c*x) + 12*b^3*arctan(c*x)^2*log(c^2*x^2 + 1) + b
^3*log(c^2*x^2 + 1)^3)/(c^2*d*x^2 + d), x))/(c*d)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^3}{d + c\,d\,x\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(d + c*d*x*1i),x)
[Out] int((a + b*atan(c*x))^3/(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/(d+I*c*d*x),x)
[Out] Timed out
```

3.124 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{(d+icdx)^2} dx$

Optimal. Leaf size=182

$$\frac{3b^2\left(a+b\tan^{-1}(cx)\right)}{2cd^2(-cx+i)}+\frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2(-cx+i)}-\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{4cd^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)^3}{cd^2(1+icx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2cd^2}$$

```
[Out] -3/4*I*b^3/c/d^2/(I-c*x)+3/4*I*b^3*arctan(c*x)/c/d^2+3/2*b^2*(a+b*arctan(c*
x))/c/d^2/(I-c*x)-3/4*b*(a+b*arctan(c*x))^2/c/d^2+3/2*I*b*(a+b*arctan(c*x))
^2/c/d^2/(I-c*x)-1/2*I*(a+b*arctan(c*x))^3/c/d^2+I*(a+b*arctan(c*x))^3/c/d^
2/(1+I*c*x)
```

Rubi [A] time = 0.22, antiderivative size = 182, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4864, 4862, 627, 44, 203, 4884}

$$\frac{3b^2\left(a+b\tan^{-1}(cx)\right)}{2cd^2(-cx+i)}+\frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2(-cx+i)}-\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{4cd^2}+\frac{i\left(a+b\tan^{-1}(cx)\right)^3}{cd^2(1+icx)}-\frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2cd^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(d + I*c*d*x)^2,x]
```

```
[Out] (((-3*I)/4)*b^3)/(c*d^2*(I - c*x)) + (((3*I)/4)*b^3*ArcTan[c*x])/(c*d^2) +
(3*b^2*(a + b*ArcTan[c*x]))/(2*c*d^2*(I - c*x)) - (3*b*(a + b*ArcTan[c*x])^
2)/(4*c*d^2) + (((3*I)/2)*b*(a + b*ArcTan[c*x])^2)/(c*d^2*(I - c*x)) - ((I/
2)*(a + b*ArcTan[c*x])^3)/(c*d^2) + (I*(a + b*ArcTan[c*x])^3)/(c*d^2*(1 + I
*c*x))
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{(d+icdx)^2}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{cd^2(1+icx)} - \frac{(3ib)\int\left(-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d(-i+cx)^2}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(1+c^2x^2\right)}\right)dx}{d}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{cd^2(1+icx)} + \frac{(3ib)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}dx}{2d^2} - \frac{(3ib)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}dx}{2d^2}$$

$$= \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{cd^2(1+icx)} + \frac{\left(3ib^2\right)\int\left(-\frac{i(a+b}{2(}\right.}{}$$

$$= \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2cd^2} + \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{cd^2(1+icx)} + \frac{\left(3b^2\right)\int\frac{a+b\tan^{-1}}{(-i+cx}}{2d^2}$$

$$= \frac{3b^2\left(a+b\tan^{-1}(cx)\right)}{2cd^2(i-cx)} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{4cd^2} + \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2(i-cx)} - \frac{i\left(a+b\tan^{-}\right.}{2cd^2}$$

$$= \frac{3b^2\left(a+b\tan^{-1}(cx)\right)}{2cd^2(i-cx)} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{4cd^2} + \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2(i-cx)} - \frac{i\left(a+b\tan^{-}\right.}{2cd^2}$$

$$= \frac{3b^2\left(a+b\tan^{-1}(cx)\right)}{2cd^2(i-cx)} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{4cd^2} + \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{2cd^2(i-cx)} - \frac{i\left(a+b\tan^{-}\right.}{2cd^2}$$

$$= -\frac{3ib^3}{4cd^2(i-cx)} + \frac{3b^2\left(a+b\tan^{-1}(cx)\right)}{2cd^2(i-cx)} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{4cd^2} + \frac{3ib\left(a+b\tan^{-1}(cx)\right)}{2cd^2(i-cx)}$$

$$= -\frac{3ib^3}{4cd^2(i-cx)} + \frac{3ib^3\tan^{-1}(cx)}{4cd^2} + \frac{3b^2\left(a+b\tan^{-1}(cx)\right)}{2cd^2(i-cx)} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{4cd^2} + \frac{3ib}{}$$

Mathematica [A] time = 0.24, size = 121, normalized size = 0.66

$$\frac{4a^3+3ib\left(-2a^2+2iab+b^2\right)(cx+i)\tan^{-1}(cx)-6ia^2b-3b^2(b+2ia)(cx+i)\tan^{-1}(cx)^2-6ab^2+2b^3(1-icx)\tan}{4cd^2(cx-i)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(d + I*c*d*x)^2,x]
```

```
[Out] (4*a^3 - (6*I)*a^2*b - 6*a*b^2 + (3*I)*b^3 + (3*I)*b*(-2*a^2 + (2*I)*a*b +
b^2)*(I + c*x)*ArcTan[c*x] - 3*b^2*((2*I)*a + b)*(I + c*x)*ArcTan[c*x]^2 +
2*b^3*(1 - I*c*x)*ArcTan[c*x]^3)/(4*c*d^2*(-I + c*x))
```

fricas [A] time = 0.67, size = 176, normalized size = 0.97

$$-\frac{\left(b^3cx+i\,b^3\right)\log\left(-\frac{cx+i}{cx-i}\right)^3-16\,a^3+24i\,a^2b+24\,ab^2-12i\,b^3+\left(6\,ab^2-3i\,b^3+3\left(-2i\,ab^2-b^3\right)cx\right)\log\left(-\frac{cx+i}{cx-i}\right.}{16\,c^2d^2x-16i\,cd^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^2,x, algorithm="fricas")
```

```
[Out] -((b^3*c*x + I*b^3)*log(-(c*x + I)/(c*x - I))^3 - 16*a^3 + 24*I*a^2*b + 24*
a*b^2 - 12*I*b^3 + (6*a*b^2 - 3*I*b^3 + 3*(-2*I*a*b^2 - b^3)*c*x)*log(-(c*x
 + I)/(c*x - I))^2 - (12*I*a^2*b + 12*a*b^2 - 6*I*b^3 + 6*(2*a^2*b - 2*I*a*
b^2 - b^3)*c*x)*log(-(c*x + I)/(c*x - I)))/(16*c^2*d^2*x - 16*I*c*d^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.89, size = 551, normalized size = 3.03

$$\frac{3ib^3}{4c\,d^2\,(cx-i)}-\frac{3ia^2b\arctan(cx)}{2c\,d^2}-\frac{b^3\arctan(cx)^3}{2c\,d^2\,(cx-i)}+\frac{ib^3\arctan(cx)^3}{c\,d^2\,(icx+1)}-\frac{3b^3\arctan(cx)^2\,x}{4d^2\,(cx-i)}+\frac{3ia\,b^2\ln(cx-i)\ln\left(-\right.}{4c\,d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^3/(d+I*c*d*x)^2,x)
```

```
[Out] 3/4*I/c*b^3/d^2/(c*x-I)-3/2*I/c*a^2*b/d^2*arctan(c*x)-1/2/c*b^3/d^2/(c*x-I)
*arctan(c*x)^3+I/c*b^3/d^2/(1+I*c*x)*arctan(c*x)^3-3/4*b^3/d^2/(c*x-I)*arct
an(c*x)^2*x+3/4*I/c*a*b^2/d^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))-3/4/c*b^3/d^2/(c
*x-I)*arctan(c*x)+I/c*a^3/d^2/(1+I*c*x)+3*I/c*a^2*b/d^2/(1+I*c*x)*arctan(c*
x)+3/4*I*b^3/d^2/(c*x-I)*arctan(c*x)*x+3/2/c*a*b^2/d^2*arctan(c*x)*ln(I+c*x
)-3/2/c*a*b^2/d^2*arctan(c*x)*ln(c*x-I)-3/4*I/c*b^3/d^2/(c*x-I)*arctan(c*x)
^2-3*I/c*a*b^2/d^2*arctan(c*x)/(c*x-I)-3/8*I/c*a*b^2/d^2*ln(I+c*x)^2-3/2/c*
a*b^2/d^2*arctan(c*x)-3/2/c*a*b^2/d^2/(c*x-I)-3/2*I/c*a^2*b/d^2/(c*x-I)-3/4
*I/c*a*b^2/d^2*ln(-1/2*I*(-c*x+I))*ln(-1/2*I*(I+c*x))-1/2*I*b^3/d^2/(c*x-I)
*arctan(c*x)^3*x+3/4*I/c*a*b^2/d^2*ln(-1/2*I*(-c*x+I))*ln(I+c*x)+3*I/c*a*b^
2/d^2/(1+I*c*x)*arctan(c*x)^2-3/8*I/c*a*b^2/d^2*ln(c*x-I)^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^3}{\left(d+c\,d\,x\,1\mathrm{i}\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(d + c*d*x*1i)^2,x)
```

```
[Out] int((a + b*atan(c*x))^3/(d + c*d*x*1i)^2, x)
```

sympy [B] time = 37.13, size = 627, normalized size = 3.45

$$-\frac{3ib\left(a\left(1-i\right)-b\right)\left(a\left(1-i\right)-ib\right)\log\left(-\frac{3b(a(1-i)-b)(a(1-i)-ib)}{c}+x\left(-6a^{2}b+6iab^{2}+3b^{3}\right)\right)}{8cd^{2}}+\frac{3ib\left(a\left(1-i\right)-b\right)\left(a\left(1-i\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/(d+I*c*d*x)**2,x)
```

```
[Out] -3*I*b*(a*(1 - I) - b)*(a*(1 - I) - I*b)*log(-3*b*(a*(1 - I) - b)*(a*(1 - I
) - I*b)/c + x*(-6*a**2*b + 6*I*a*b**2 + 3*b**3))/(8*c*d**2) + 3*I*b*(a*(1
- I) - b)*(a*(1 - I) - I*b)*log(3*b*(a*(1 - I) - b)*(a*(1 - I) - I*b)/c + x
*(-6*a**2*b + 6*I*a*b**2 + 3*b**3))/(8*c*d**2) + (-I*b**3*c*x + b**3)*log(-
I*c*x + 1)**3/(16*I*c**2*d**2*x + 16*c*d**2) + (I*b**3*c*x - b**3)*log(I*c*
x + 1)**3/(16*I*c**2*d**2*x + 16*c*d**2) + (-6*a*b**2*c*x - 6*I*a*b**2 + 3*
I*b**3*c*x*log(I*c*x + 1) + 3*I*b**3*c*x - 3*b**3*log(I*c*x + 1) - 3*b**3)*
log(-I*c*x + 1)**2/(16*I*c**2*d**2*x + 16*c*d**2) + (-24*a**2*b + 12*a*b**2
*c*x*log(I*c*x + 1) + 12*I*a*b**2*log(I*c*x + 1) + 24*I*a*b**2 - 3*I*b**3*c
*x*log(I*c*x + 1)**2 - 6*I*b**3*c*x*log(I*c*x + 1) + 3*b**3*log(I*c*x + 1)*
*2 + 6*b**3*log(I*c*x + 1) + 12*b**3)*log(-I*c*x + 1)/(16*I*c**2*d**2*x + 1
6*c*d**2) + (6*a**2*b - 6*I*a*b**2 - 3*b**3)*log(I*c*x + 1)/(4*I*c**2*d**2*
x + 4*c*d**2) + (6*a*b**2*c*x + 6*I*a*b**2 - 3*I*b**3*c*x + 3*b**3)*log(I*c
*x + 1)**2/(-16*I*c**2*d**2*x - 16*c*d**2) - (-4*a**3 + 6*I*a**2*b + 6*a*b*
*2 - 3*I*b**3)/(4*c**2*d**2*x - 4*I*c*d**2)
```

3.125 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{(d+icdx)^3}\,dx$

Optimal. Leaf size=271

$$\frac{9b^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(-cx+i)}+\frac{3ib^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(-cx+i)^2}+\frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(-cx+i)}-\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(-cx+i)^2}-\frac{9b\left(a+b\tan^{-1}(c\right.}{32cd^3}$$

```
[Out] 3/64*b^3/c/d^3/(I-c*x)^2-21/64*I*b^3/c/d^3/(I-c*x)+21/64*I*b^3*arctan(c*x)/
c/d^3+3/16*I*b^2*(a+b*arctan(c*x))/c/d^3/(I-c*x)^2+9/16*b^2*(a+b*arctan(c*x
))/c/d^3/(I-c*x)-9/32*b*(a+b*arctan(c*x))^2/c/d^3-3/8*b*(a+b*arctan(c*x))^2
/c/d^3/(I-c*x)^2+3/8*I*b*(a+b*arctan(c*x))^2/c/d^3/(I-c*x)-1/8*I*(a+b*arcta
n(c*x))^3/c/d^3+1/2*I*(a+b*arctan(c*x))^3/c/d^3/(1+I*c*x)^2
```

Rubi [A] time = 0.40, antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4864, 4862, 627, 44, 203, 4884}

$$\frac{9b^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(-cx+i)}+\frac{3ib^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(-cx+i)^2}+\frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(-cx+i)}-\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(-cx+i)^2}-\frac{9b\left(a+b\tan^{-1}(c\right.}{32cd^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(d + I*c*d*x)^3,x]
```

```
[Out] (3*b^3)/(64*c*d^3*(I - c*x)^2) - (((21*I)/64)*b^3)/(c*d^3*(I - c*x)) + (((2
1*I)/64)*b^3*ArcTan[c*x])/(c*d^3) + (((3*I)/16)*b^2*(a + b*ArcTan[c*x]))/(c
*d^3*(I - c*x)^2) + (9*b^2*(a + b*ArcTan[c*x]))/(16*c*d^3*(I - c*x)) - (9*b
*(a + b*ArcTan[c*x])^2)/(32*c*d^3) - (3*b*(a + b*ArcTan[c*x])^2)/(8*c*d^3*(
I - c*x)^2) + (((3*I)/8)*b*(a + b*ArcTan[c*x])^2)/(c*d^3*(I - c*x)) - ((I/8
)*(a + b*ArcTan[c*x])^3)/(c*d^3) + ((I/2)*(a + b*ArcTan[c*x])^3)/(c*d^3*(1
+ I*c*x)^2)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{(d+icdx)^3}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2cd^3(1+icx)^2} - \frac{(3ib)\int \left(\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{2d^2(-i+cx)^3} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2(-i+cx)^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1+c^2x^2\right)}\right)dx}{2d}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2cd^3(1+icx)^2} + \frac{(3ib)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}\,dx}{8d^3} - \frac{(3ib)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}\,dx}{8d^3} + \frac{(3b)\int \frac{(a+}{}}{}$$

$$= -\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(i-cx)^2} + \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{8cd^3} + \frac{i\left(a+b\tan^{-}\right.}{2cd^3(1+i}$$

$$= -\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(i-cx)^2} + \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^3(i-cx)} - \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{8cd^3} + \frac{i\left(a+b\tan^{-}\right.}{2cd^3(1+i}$$

$$= \frac{3ib^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)^2} + \frac{9b^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)} - \frac{9b\left(a+b\tan^{-1}(cx)\right)^2}{32cd^3} - \frac{3b\left(a+b\tan\right.}{8cd^3(i-}$$

$$= \frac{3ib^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)^2} + \frac{9b^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)} - \frac{9b\left(a+b\tan^{-1}(cx)\right)^2}{32cd^3} - \frac{3b\left(a+b\tan\right.}{8cd^3(i-}$$

$$= \frac{3ib^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)^2} + \frac{9b^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)} - \frac{9b\left(a+b\tan^{-1}(cx)\right)^2}{32cd^3} - \frac{3b\left(a+b\tan\right.}{8cd^3(i-}$$

$$= \frac{3b^3}{64cd^3(i-cx)^2} - \frac{21ib^3}{64cd^3(i-cx)} + \frac{3ib^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)^2} + \frac{9b^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)} - \frac{9b}{}$$

$$= \frac{3b^3}{64cd^3(i-cx)^2} - \frac{21ib^3}{64cd^3(i-cx)} + \frac{21ib^3\tan^{-1}(cx)}{64cd^3} + \frac{3ib^2\left(a+b\tan^{-1}(cx)\right)}{16cd^3(i-cx)^2} + \frac{9b^2\left(a+\right.}{16cd}$$

Mathematica [A] time = 0.30, size = 183, normalized size = 0.68

$$-\frac{i\left(32a^3+3b(cx+i)\tan^{-1}(cx)\left(8a^2(cx-3i)+4ab(-5-3icx)+b^2(-7cx+9i)\right)+24a^2b(cx-2i)+12ab^2(-4-3i\right.}{64cd^3(c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(d + I*c*d*x)^3,x]
```

```
[Out] ((-1/64*I)*(32*a^3 + 3*b^3*(8*I - 7*c*x) + 12*a*b^2*(-4 - (3*I)*c*x) + 24*a
^2*b*(-2*I + c*x) + 3*b*(I + c*x)*(b^2*(9*I - 7*c*x) + 4*a*b*(-5 - (3*I)*c*
x) + 8*a^2*(-3*I + c*x))*ArcTan[c*x] + 6*b^2*(I + c*x)*(b*(-5 - (3*I)*c*x)
```

```
+ 4*a*(-3*I + c*x))*ArcTan[c*x]^2 + 8*b^3*(3 - (2*I)*c*x + c^2*x^2)*ArcTan[
c*x]^3))/(c*d^3*(-I + c*x)^2)
```

fricas [A] time = 0.88, size = 265, normalized size = 0.98

$$-\frac{\left(2\,b^3c^2x^2-4i\,b^3cx+6\,b^3\right)\log\left(-\frac{cx+i}{cx-i}\right)^3+64i\,a^3+96\,a^2b-96i\,ab^2-48\,b^3-\left(-48i\,a^2b-72\,ab^2+42i\,b^3\right)cx+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^3,x, algorithm="fricas")
```

```
[Out] -1/128*((2*b^3*c^2*x^2 - 4*I*b^3*c*x + 6*b^3)*log(-(c*x + I)/(c*x - I))^3 +
 64*I*a^3 + 96*a^2*b - 96*I*a*b^2 - 48*b^3 - (-48*I*a^2*b - 72*a*b^2 + 42*I
*b^3)*c*x + (3*(-4*I*a*b^2 - 3*b^3)*c^2*x^2 - 36*I*a*b^2 - 15*b^3 - (24*a*b
^2 - 6*I*b^3)*c*x)*log(-(c*x + I)/(c*x - I))^2 - (3*(8*a^2*b - 12*I*a*b^2 -
 7*b^3)*c^2*x^2 + 72*a^2*b - 60*I*a*b^2 - 27*b^3 + (-48*I*a^2*b - 24*a*b^2
+ 6*I*b^3)*c*x)*log(-(c*x + I)/(c*x - I)))/(c^3*d^3*x^2 - 2*I*c^2*d^3*x - c
*d^3)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.02, size = 711, normalized size = 2.62

$$\frac{3ia\,b^2\ln(cx-i)\ln\left(-\frac{i(cx+i)}{2}\right)}{16c\,d^3}+\frac{3ia^2b\arctan(cx)}{2c\,d^3\,(icx+1)^2}-\frac{3ia\,b^2\ln(cx-i)^2}{32c\,d^3}-\frac{3ia^2b\arctan(cx)}{8c\,d^3}+\frac{3ib^3\arctan(cx)^2\,x}{16d^3\,(cx-i)^2}-\frac{9c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^3/(d+I*c*d*x)^3,x)
```

```
[Out] 3/2*I/c*a*b^2/d^3/(1+I*c*x)^2*arctan(c*x)^2-3/4*I/c*a*b^2/d^3*arctan(c*x)/(
c*x-I)-1/8*I*c*b^3/d^3/(c*x-I)^2*arctan(c*x)^3*x^2+21/64*I*c*b^3/d^3/(c*x-I
)^2*x^2*arctan(c*x)-3/16*I/c*a*b^2/d^3*ln(-1/2*I*(-c*x+I))*ln(-1/2*I*(I+c*x
))+3/16*I/c*a*b^2/d^3*ln(-1/2*I*(-c*x+I))*ln(I+c*x)+3/16*I/c*a*b^2/d^3*ln(c
*x-I)*ln(-1/2*I*(I+c*x))+3/2*I/c*a^2*b/d^3/(1+I*c*x)^2*arctan(c*x)-3/8/c*a*
b^2/d^3*arctan(c*x)*ln(c*x-I)-3/4/c*a*b^2/d^3/(c*x-I)^2*arctan(c*x)+1/2*I/c
*b^3/d^3/(1+I*c*x)^2*arctan(c*x)^3+1/8*I/c*b^3/d^3/(c*x-I)^2*arctan(c*x)^3+
27/64*I/c*b^3/d^3/(c*x-I)^2*arctan(c*x)+3/16*I/c*a*b^2/d^3/(c*x-I)^2-3/32*I
/c*a*b^2/d^3*ln(c*x-I)^2-3/8*I/c*a^2*b/d^3*arctan(c*x)+3/16*I*b^3/d^3/(c*x-
I)^2*arctan(c*x)^2*x-9/32*c*b^3/d^3/(c*x-I)^2*arctan(c*x)^2*x^2+3/8/c*a*b^2
/d^3*arctan(c*x)*ln(I+c*x)-3/8*I/c*a^2*b/d^3/(c*x-I)-3/32*I/c*a*b^2/d^3*ln(
I+c*x)^2-9/16/c*a*b^2/d^3*arctan(c*x)-15/32/c*b^3/d^3/(c*x-I)^2*arctan(c*x)
^2-9/16/c*a*b^2/d^3/(c*x-I)-1/4*b^3/d^3/(c*x-I)^2*arctan(c*x)^3*x+3/32*b^3/
d^3/(c*x-I)^2*arctan(c*x)*x+1/2*I/c*a^3/d^3/(1+I*c*x)^2+21/64*I*b^3/d^3/(c*
x-I)^2*x+3/8/c*b^3/d^3/(c*x-I)^2-3/8/c*a^2*b/d^3/(c*x-I)^2
```

maxima [A] time = 0.48, size = 229, normalized size = 0.85

$$-\frac{\left(8i\,b^3c^2x^2+16\,b^3cx+24i\,b^3\right)\arctan(cx)^3+32i\,a^3+48\,a^2b-48i\,ab^2-24\,b^3+\left(24i\,a^2b+36\,ab^2-21i\,b^3\right)cx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^3,x, algorithm="maxima")
```

```
[Out] -((8*I*b^3*c^2*x^2 + 16*b^3*c*x + 24*I*b^3)*arctan(c*x)^3 + 32*I*a^3 + 48*a
^2*b - 48*I*a*b^2 - 24*b^3 + (24*I*a^2*b + 36*a*b^2 - 21*I*b^3)*c*x + ((24*
I*a*b^2 + 18*b^3)*c^2*x^2 + 72*I*a*b^2 + 30*b^3 + 12*(4*a*b^2 - I*b^3)*c*x)
*arctan(c*x)^2 + ((24*I*a^2*b + 36*a*b^2 - 21*I*b^3)*c^2*x^2 + 72*I*a^2*b +
 60*a*b^2 - 27*I*b^3 + (48*a^2*b - 24*I*a*b^2 - 6*b^3)*c*x)*arctan(c*x))/(6
4*c^3*d^3*x^2 - 128*I*c^2*d^3*x - 64*c*d^3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^3}{(d + c\,d\,x\,1\mathrm{i})^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(d + c*d*x*1i)^3,x)
```

```
[Out] int((a + b*atan(c*x))^3/(d + c*d*x*1i)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/(d+I*c*d*x)**3,x)
```

```
[Out] Timed out
```

3.126 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{(d+icdx)^4}\,dx$

Optimal. Leaf size=360

$$\frac{11b^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(-cx+i)}+\frac{5ib^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(-cx+i)^2}-\frac{b^2\left(a+b\tan^{-1}(cx)\right)}{18cd^4(-cx+i)^3}+\frac{ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^4(-cx+i)}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{8cd^4(-cx+i)^2}$$

```
[Out] 1/108*I*b^3/c/d^4/(I-c*x)^3+19/576*b^3/c/d^4/(I-c*x)^2-85/576*I*b^3/c/d^4/(
I-c*x)+85/576*I*b^3*arctan(c*x)/c/d^4-1/18*b^2*(a+b*arctan(c*x))/c/d^4/(I-c
*x)^3+5/48*I*b^2*(a+b*arctan(c*x))/c/d^4/(I-c*x)^2+11/48*b^2*(a+b*arctan(c*
x))/c/d^4/(I-c*x)-11/96*b*(a+b*arctan(c*x))^2/c/d^4-1/6*I*b*(a+b*arctan(c*x
))^2/c/d^4/(I-c*x)^3-1/8*b*(a+b*arctan(c*x))^2/c/d^4/(I-c*x)^2+1/8*I*b*(a+b
*arctan(c*x))^2/c/d^4/(I-c*x)-1/24*I*(a+b*arctan(c*x))^3/c/d^4+1/3*I*(a+b*a
rctan(c*x))^3/c/d^4/(1+I*c*x)^3
```

Rubi [**A**] time = 0.67, antiderivative size = 360, normalized size of antiderivative = 1.00, number of steps used = 42, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4864, 4862, 627, 44, 203, 4884}

$$\frac{11b^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(-cx+i)}+\frac{5ib^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(-cx+i)^2}-\frac{b^2\left(a+b\tan^{-1}(cx)\right)}{18cd^4(-cx+i)^3}+\frac{ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^4(-cx+i)}-\frac{b\left(a+b\tan^{-1}(cx)\right)}{8cd^4(-cx+i)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(d + I*c*d*x)^4,x]
```

```
[Out] ((I/108)*b^3)/(c*d^4*(I - c*x)^3) + (19*b^3)/(576*c*d^4*(I - c*x)^2) - (((8
5*I)/576)*b^3)/(c*d^4*(I - c*x)) + (((85*I)/576)*b^3*ArcTan[c*x])/(c*d^4) -
 (b^2*(a + b*ArcTan[c*x]))/(18*c*d^4*(I - c*x)^3) + (((5*I)/48)*b^2*(a + b*
ArcTan[c*x]))/(c*d^4*(I - c*x)^2) + (11*b^2*(a + b*ArcTan[c*x]))/(48*c*d^4*
(I - c*x)) - (11*b*(a + b*ArcTan[c*x])^2)/(96*c*d^4) - ((I/6)*b*(a + b*ArcT
an[c*x])^2)/(c*d^4*(I - c*x)^3) - (b*(a + b*ArcTan[c*x])^2)/(8*c*d^4*(I - c
*x)^2) + ((I/8)*b*(a + b*ArcTan[c*x])^2)/(c*d^4*(I - c*x)) - ((I/24)*(a + b
*ArcTan[c*x])^3)/(c*d^4) + ((I/3)*(a + b*ArcTan[c*x])^3)/(c*d^4*(1 + I*c*x)
^3)
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 627

```
Int[((d_) + (e_.)*(x_))^(m_.)*((a_) + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int
[(d + e*x)^(m + p)*(a/d + (c*x)/e)^p, x] /; FreeQ[{a, c, d, e, m, p}, x] &&
 EqQ[c*d^2 + a*e^2, 0] && (IntegerQ[p] || (GtQ[a, 0] && GtQ[d, 0] && Intege
rQ[m + p]))
```

Rule 4862

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_))^(q_.), x_Symbol]
 :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x]))/(e*(q + 1)), x] - Dist[(b*
c)/(e*(q + 1)), Int[(d + e*x)^(q + 1)/(1 + c^2*x^2), x], x] /; FreeQ[{a, b,
 c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{(d+icdx)^4}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{3cd^4(1+icx)^3} - \frac{(ib)\int\left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^3(-i+cx)^4}+\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{4d^3(-i+cx)^3}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{8d^3(-i+cx)^2}+\frac{\left(a+b\tan^{-1}\right.}{8d^3(1+}\right.}{d}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{3cd^4(1+icx)^3} + \frac{(ib)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{(-i+cx)^2}dx}{8d^4} - \frac{(ib)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}dx}{8d^4} - \frac{(ib)\int\frac{\left(a+b\tan\right.}{(-i}}{2d}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)^2}{6cd^4(i-cx)^3} - \frac{b\left(a+b\tan^{-1}(cx)\right)^2}{8cd^4(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^4(i-cx)} - \frac{i\left(a+b\tan^{-1}\right.}{24cd^4}$$

$$= -\frac{ib\left(a+b\tan^{-1}(cx)\right)^2}{6cd^4(i-cx)^3} - \frac{b\left(a+b\tan^{-1}(cx)\right)^2}{8cd^4(i-cx)^2} + \frac{ib\left(a+b\tan^{-1}(cx)\right)^2}{8cd^4(i-cx)} - \frac{i\left(a+b\tan^{-1}\right.}{24cd^4}$$

$$= -\frac{b^2\left(a+b\tan^{-1}(cx)\right)}{18cd^4(i-cx)^3} + \frac{5ib^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(i-cx)^2} + \frac{11b^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(i-cx)} - \frac{11b\left(a+b\right.}{96}$$

$$= -\frac{b^2\left(a+b\tan^{-1}(cx)\right)}{18cd^4(i-cx)^3} + \frac{5ib^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(i-cx)^2} + \frac{11b^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(i-cx)} - \frac{11b\left(a+b\right.}{96}$$

$$= -\frac{b^2\left(a+b\tan^{-1}(cx)\right)}{18cd^4(i-cx)^3} + \frac{5ib^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(i-cx)^2} + \frac{11b^2\left(a+b\tan^{-1}(cx)\right)}{48cd^4(i-cx)} - \frac{11b\left(a+b\right.}{96}$$

$$= \frac{ib^3}{108cd^4(i-cx)^3} + \frac{19b^3}{576cd^4(i-cx)^2} - \frac{85ib^3}{576cd^4(i-cx)} - \frac{b^2\left(a+b\tan^{-1}(cx)\right)}{18cd^4(i-cx)^3} + \frac{5ib^2\left(a-\right.}{48cd}$$

$$= \frac{ib^3}{108cd^4(i-cx)^3} + \frac{19b^3}{576cd^4(i-cx)^2} - \frac{85ib^3}{576cd^4(i-cx)} + \frac{85ib^3\tan^{-1}(cx)}{576cd^4} - \frac{b^2\left(a+b\tan\right.}{18cd^4(i-}$$

Mathematica [A] time = 0.32, size = 269, normalized size = 0.75

$$\frac{-576a^3+3b(cx+i)\tan^{-1}(cx)\left(-72ia^2\left(c^2x^2-4icx-7\right)+12ab\left(-11c^2x^2+32icx+29\right)+b^2\left(85ic^2x^2+208cx-\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(d + I*c*d*x)^4,x]
```

```
[Out] (-576*a^3 + 12*a*b^2*(56 + (81*I)*c*x - 33*c^2*x^2) + b^3*(-328*I + 567*c*x
 + (255*I)*c^2*x^2) - (72*I)*a^2*b*(-10 - (9*I)*c*x + 3*c^2*x^2) + 3*b*(I +
 c*x)*(12*a*b*(29 + (32*I)*c*x - 11*c^2*x^2) + b^2*(-139*I + 208*c*x + (85*
I)*c^2*x^2) - (72*I)*a^2*(-7 - (4*I)*c*x + c^2*x^2))*ArcTan[c*x] - (18*I)*b
^2*(I + c*x)*(b*(29*I - 32*c*x - (11*I)*c^2*x^2) + 12*a*(-7 - (4*I)*c*x + c
^2*x^2))*ArcTan[c*x]^2 - (72*I)*b^3*(-7*I - 3*c*x - (3*I)*c^2*x^2 + c^3*x^3
)*ArcTan[c*x]^3)/(1728*c*d^4*(-I + c*x)^3)
```

fricas [A] time = 0.53, size = 359, normalized size = 1.00

$$\left(-432i\,a^2b - 792\,ab^2 + 510i\,b^3\right)c^2x^2 - \left(18\,b^3c^3x^3 - 54i\,b^3c^2x^2 - 54\,b^3cx - 126i\,b^3\right)\log\left(-\frac{cx+i}{cx-i}\right)^3 - 1152\,a^3 + 14$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^4,x, algorithm="fricas")
```

```
[Out] ((-432*I*a^2*b - 792*a*b^2 + 510*I*b^3)*c^2*x^2 - (18*b^3*c^3*x^3 - 54*I*b^
3*c^2*x^2 - 54*b^3*c*x - 126*I*b^3)*log(-(c*x + I)/(c*x - I))^3 - 1152*a^3
+ 1440*I*a^2*b + 1344*a*b^2 - 656*I*b^3 - 162*(8*a^2*b - 12*I*a*b^2 - 7*b^3
)*c*x - (9*(-12*I*a*b^2 - 11*b^3)*c^3*x^3 - (324*a*b^2 - 189*I*b^3)*c^2*x^2
 - 756*a*b^2 + 261*I*b^3 + 27*(12*I*a*b^2 - b^3)*c*x)*log(-(c*x + I)/(c*x -
 I))^2 + (3*(72*a^2*b - 132*I*a*b^2 - 85*b^3)*c^3*x^3 + (-648*I*a^2*b - 756
*a*b^2 + 369*I*b^3)*c^2*x^2 - 1512*I*a^2*b - 1044*a*b^2 + 417*I*b^3 - 9*(72
*a^2*b + 12*I*a*b^2 + 23*b^3)*c*x)*log(-(c*x + I)/(c*x - I)))/(3456*c^4*d^4
*x^3 - 10368*I*c^3*d^4*x^2 - 10368*c^2*d^4*x + 3456*I*c*d^4)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.09, size = 881, normalized size = 2.45

$$\frac{139b^3\arctan(cx)}{576c\,d^4\,(cx-i)^3} - \frac{41ib^3}{216c\,d^4\,(cx-i)^3} + \frac{ia^3}{3c\,d^4\,(icx+1)^3} - \frac{11a\,b^2}{48c\,d^4\,(cx-i)} + \frac{a\,b^2}{18c\,d^4\,(cx-i)^3} - \frac{c\,b^3\arctan(cx)^3\,x^2}{8d^4\,(cx-i)^3} - 11$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^3/(d+I*c*d*x)^4,x)
```

```
[Out] 41/192*c*b^3/d^4/(c*x-I)^3*x^2*arctan(c*x)+85/576*I*c*b^3/d^4/(c*x-I)^3*x^2
-1/8*I/c*a^2*b/d^4*arctan(c*x)+1/3*I/c*b^3/d^4/(1+I*c*x)^3*arctan(c*x)^3+29
/96*I/c*b^3/d^4/(c*x-I)^3*arctan(c*x)^2-1/8*c*b^3/d^4/(c*x-I)^3*arctan(c*x)
^3*x^2-11/96*c^2*b^3/d^4/(c*x-I)^3*arctan(c*x)^2*x^3+1/6*I/c*a^2*b/d^4/(c*x
-I)^3-1/8*I/c*a^2*b/d^4/(c*x-I)-1/32*I/c*a*b^2/d^4*ln(I+c*x)^2-1/32*I/c*a*b
^2/d^4*ln(c*x-I)^2+5/48*I/c*a*b^2/d^4/(c*x-I)^2+23/192*I*b^3/d^4/(c*x-I)^3*
arctan(c*x)*x+1/8*I*b^3/d^4/(c*x-I)^3*arctan(c*x)^3*x-1/32*b^3/d^4/(c*x-I)^
3*arctan(c*x)^2*x-11/48/c*a*b^2/d^4*arctan(c*x)-1/8/c*a^2*b/d^4/(c*x-I)^2+1
/24/c*b^3/d^4/(c*x-I)^3*arctan(c*x)^3+139/576/c*b^3/d^4/(c*x-I)^3*arctan(c*
x)-41/216*I/c*b^3/d^4/(c*x-I)^3+1/3*I/c*a^3/d^4/(1+I*c*x)^3-11/48/c*a*b^2/d
^4/(c*x-I)-1/4/c*a*b^2/d^4*arctan(c*x)/(c*x-I)^2+1/8/c*a*b^2/d^4*arctan(c*x
)*ln(I+c*x)-1/8/c*a*b^2/d^4*arctan(c*x)*ln(c*x-I)-1/16*I/c*a*b^2/d^4*ln(-1/
2*I*(-c*x+I))*ln(-1/2*I*(I+c*x))+1/16*I/c*a*b^2/d^4*ln(-1/2*I*(-c*x+I))*ln(
```

```
I+c*x)+1/16*I/c*a*b^2/d^4*ln(c*x-I)*ln(-1/2*I*(I+c*x))+1/3*I/c*a*b^2/d^4*ar
ctan(c*x)/(c*x-I)^3-1/4*I/c*a*b^2/d^4*arctan(c*x)/(c*x-I)-1/24*I*c^2*b^3/d^
4/(c*x-I)^3*arctan(c*x)^3*x^3+7/32*I*c*b^3/d^4/(c*x-I)^3*arctan(c*x)^2*x^2+
85/576*I*c^2*b^3/d^4/(c*x-I)^3*arctan(c*x)*x^3+I/c*a^2*b/d^4/(1+I*c*x)^3*ar
ctan(c*x)+I/c*a*b^2/d^4/(1+I*c*x)^3*arctan(c*x)^2+1/18/c*a*b^2/d^4/(c*x-I)^
3+21/64*b^3/d^4/(c*x-I)^3*x
```

maxima [A] time = 0.57, size = 320, normalized size = 0.89

$$-\frac{\left(216i\,a^2b+396\,ab^2-255i\,b^3\right)c^2x^2+\left(72i\,b^3c^3x^3+216\,b^3c^2x^2-216i\,b^3cx+504\,b^3\right)\arctan\left(cx\right)^3+576\,a^3-720}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x)^4,x, algorithm="maxima")
```

```
[Out] -((216*I*a^2*b + 396*a*b^2 - 255*I*b^3)*c^2*x^2 + (72*I*b^3*c^3*x^3 + 216*b
^3*c^2*x^2 - 216*I*b^3*c*x + 504*b^3)*arctan(c*x)^3 + 576*a^3 - 720*I*a^2*b
 - 672*a*b^2 + 328*I*b^3 + (648*a^2*b - 972*I*a*b^2 - 567*b^3)*c*x + ((216*
I*a*b^2 + 198*b^3)*c^3*x^3 + 54*(12*a*b^2 - 7*I*b^3)*c^2*x^2 + 1512*a*b^2 -
 522*I*b^3 + (-648*I*a*b^2 + 54*b^3)*c*x)*arctan(c*x)^2 + ((216*I*a^2*b + 3
96*a*b^2 - 255*I*b^3)*c^3*x^3 + (648*a^2*b - 756*I*a*b^2 - 369*b^3)*c^2*x^2
 + 1512*a^2*b - 1044*I*a*b^2 - 417*b^3 + (-648*I*a^2*b + 108*a*b^2 - 207*I*
b^3)*c*x)*arctan(c*x))/(1728*c^4*d^4*x^3 - 5184*I*c^3*d^4*x^2 - 5184*c^2*d^
4*x + 1728*I*c*d^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^3}{\left(d+c\,d\,x\,1\mathrm{i}\right)^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(d + c*d*x*1i)^4,x)
```

```
[Out] int((a + b*atan(c*x))^3/(d + c*d*x*1i)^4, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/(d+I*c*d*x)**4,x)
```

```
[Out] Timed out
```

3.127 $\int \frac{x^2(a+b\tan^{-1}(cx))^3}{d+icdx}\,dx$

Optimal. Leaf size=410

$$\frac{3ib^2\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}-\frac{3ib^2\text{Li}_3\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{2c^3d}+\frac{3ib^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}$$

```
[Out] -3/2*b*(a+b*arctan(c*x))^2/c^3/d+3/2*I*b*x*(a+b*arctan(c*x))^2/c^2/d+1/2*I*
(a+b*arctan(c*x))^3/c^3/d+x*(a+b*arctan(c*x))^3/c^2/d-1/2*I*x^2*(a+b*arctan
(c*x))^3/c/d+3*I*b^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3/d+3*b*(a+b*arcta
n(c*x))^2*ln(2/(1+I*c*x))/c^3/d-I*(a+b*arctan(c*x))^3*ln(2/(1+I*c*x))/c^3/d
-3/2*b^3*polylog(2,1-2/(1+I*c*x))/c^3/d+3*I*b^2*(a+b*arctan(c*x))*polylog(2
,1-2/(1+I*c*x))/c^3/d+3/2*b*(a+b*arctan(c*x))^2*polylog(2,1-2/(1+I*c*x))/c^
3/d+3/2*b^3*polylog(3,1-2/(1+I*c*x))/c^3/d-3/2*I*b^2*(a+b*arctan(c*x))*poly
log(3,1-2/(1+I*c*x))/c^3/d-3/4*b^3*polylog(4,1-2/(1+I*c*x))/c^3/d
```

Rubi [A] time = 0.86, antiderivative size = 410, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 12, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.480, Rules used = {4866, 4852, 4916, 4846, 4920, 4854, 2402, 2315, 4884, 4994, 6610, 4998}

$$\frac{3ib^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^3d}-\frac{3ib^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{2c^3d}+\frac{3b\text{PolyLog}\left(2,1-\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x])^3)/(d + I*c*d*x),x]
```

```
[Out] (-3*b*(a + b*ArcTan[c*x])^2)/(2*c^3*d) + (((3*I)/2)*b*x*(a + b*ArcTan[c*x])
^2)/(c^2*d) + ((I/2)*(a + b*ArcTan[c*x])^3)/(c^3*d) + (x*(a + b*ArcTan[c*x]
)^3)/(c^2*d) - ((I/2)*x^2*(a + b*ArcTan[c*x])^3)/(c*d) + ((3*I)*b^2*(a + b*
ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c^3*d) + (3*b*(a + b*ArcTan[c*x])^2*Log[2
/(1 + I*c*x)])/(c^3*d) - (I*(a + b*ArcTan[c*x])^3*Log[2/(1 + I*c*x)])/(c^3*
d) - (3*b^3*PolyLog[2, 1 - 2/(1 + I*c*x)])/(2*c^3*d) + ((3*I)*b^2*(a + b*Ar
cTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^3*d) + (3*b*(a + b*ArcTan[c*x]
)^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(2*c^3*d) + (3*b^3*PolyLog[3, 1 - 2/(1 +
 I*c*x)])/(2*c^3*d) - (((3*I)/2)*b^2*(a + b*ArcTan[c*x])*PolyLog[3, 1 - 2/(
1 + I*c*x)])/(c^3*d) - (3*b^3*PolyLog[4, 1 - 2/(1 + I*c*x)])/(4*c^3*d)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx = \frac{i\int \frac{x\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx}{c} - \frac{i\int x\left(a+b\tan^{-1}(cx)\right)^3\,dx}{cd}$$

$$= -\frac{ix^2\left(a+b\tan^{-1}(cx)\right)^3}{2cd} - \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx}{c^2} + \frac{(3ib)\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}\,dx}{2d} + \int (\ldots$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)^3}{c^2d} - \frac{ix^2\left(a+b\tan^{-1}(cx)\right)^3}{2cd} - \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{c^3d} - \ldots$$

$$= \frac{3ibx\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2c^3d} + \frac{x\left(a+b\tan^{-1}(cx)\right)^3}{c^2d} - \frac{ix^2\left(a+\ldots\right.}{}$$

$$= -\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{3ibx\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2c^3d} + \frac{x\left(a-\ldots\right.}{}$$

$$= -\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{3ibx\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2c^3d} + \frac{x\left(a-\ldots\right.}{}$$

$$= -\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{3ibx\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2c^3d} + \frac{x\left(a-\ldots\right.}{}$$

$$= -\frac{3b\left(a+b\tan^{-1}(cx)\right)^2}{2c^3d} + \frac{3ibx\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d} + \frac{i\left(a+b\tan^{-1}(cx)\right)^3}{2c^3d} + \frac{x\left(a-\ldots\right.}{}$$

Mathematica [A] time = 1.03, size = 541, normalized size = 1.32

$$-\frac{i\left(2a^3c^2x^2 - 2a^3\log\left(c^2x^2+1\right) + 4ia^3cx - 4ia^3\tan^{-1}(cx) - 6ia^2b\log\left(c^2x^2+1\right) + 6a^2bc^2x^2\tan^{-1}(cx) - 6a^2bc\ldots\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x])^3)/(d + I*c*d*x),x]
```

```
[Out] ((-1/4*I)*((4*I)*a^3*c*x - 6*a^2*b*c*x + 2*a^3*c^2*x^2 - (4*I)*a^3*ArcTan[c
*x] + 6*a^2*b*ArcTan[c*x] + (12*I)*a^2*b*c*x*ArcTan[c*x] - 12*a*b^2*c*x*Arc
Tan[c*x] + 6*a^2*b*c^2*x^2*ArcTan[c*x] - (12*I)*a^2*b*ArcTan[c*x]^2 + 18*a*
b^2*ArcTan[c*x]^2 + (6*I)*b^3*ArcTan[c*x]^2 + (12*I)*a*b^2*c*x*ArcTan[c*x]^
2 - 6*b^3*c*x*ArcTan[c*x]^2 + 6*a*b^2*c^2*x^2*ArcTan[c*x]^2 - (8*I)*a*b^2*A
rcTan[c*x]^3 + 6*b^3*ArcTan[c*x]^3 + (4*I)*b^3*c*x*ArcTan[c*x]^3 + 2*b^3*c^
2*x^2*ArcTan[c*x]^3 - (2*I)*b^3*ArcTan[c*x]^4 + 12*a^2*b*ArcTan[c*x]*Log[1
+ E^((2*I)*ArcTan[c*x])] + (24*I)*a*b^2*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan
[c*x])] - 12*b^3*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 12*a*b^2*ArcT
an[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] + (12*I)*b^3*ArcTan[c*x]^2*Log[1 +
 E^((2*I)*ArcTan[c*x])] + 4*b^3*ArcTan[c*x]^3*Log[1 + E^((2*I)*ArcTan[c*x])
] - 2*a^3*Log[1 + c^2*x^2] - (6*I)*a^2*b*Log[1 + c^2*x^2] + 6*a*b^2*Log[1 +
 c^2*x^2] - (6*I)*b*(a + I*b + b*ArcTan[c*x])^2*PolyLog[2, -E^((2*I)*ArcTan
[c*x])] + 6*b^2*(a + I*b + b*ArcTan[c*x])*PolyLog[3, -E^((2*I)*ArcTan[c*x])
] + (3*I)*b^3*PolyLog[4, -E^((2*I)*ArcTan[c*x])]))/(c^3*d)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b^3x^2\log\left(-\frac{cx+i}{cx-i}\right)^3-6i\,ab^2x^2\log\left(-\frac{cx+i}{cx-i}\right)^2-12\,a^2bx^2\log\left(-\frac{cx+i}{cx-i}\right)+8i\,a^3x^2}{8\,cdx-8i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral(-(b^3*x^2*log(-(c*x + I)/(c*x - I))^3 - 6*I*a*b^2*x^2*log(-(c*x +
I)/(c*x - I))^2 - 12*a^2*b*x^2*log(-(c*x + I)/(c*x - I)) + 8*I*a^3*x^2)/(8*
c*d*x - 8*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 12.33, size = 1725, normalized size = 4.21

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))^3/(d+I*c*d*x),x)
```

```
[Out] 1/c^2*b^3/d*arctan(c*x)^3*x-1/2*I/c*a^3/d*x^2+3/2/c^3*b*a^2/d*ln(c*x-I)*ln(
-1/2*I*(I+c*x))-3/c^3*a*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1
))+6/c^3*a*b^2/d*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+6/c^3*a*b^
2/d*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+3/2*I/c^2*b*a^2/d*x-9/4
*I/c^3*b*a^2/d*arctan(c*x)-1/2*I/c*b^3/d*arctan(c*x)^3*x^2+3/2*I/c^2*b^3/d*
arctan(c*x)^2*x-3/2*I/c^3*a*b^2/d*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))-6*I/c
^3*a*b^2/d*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*I/c^3*a*b^2/d*dilog(1+I
*(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*I/c^3*a*b^2/d*ln((1+I*c*x)^2/(c^2*x^2+1)+1)
+3/8*I/c^3*b*a^2/d*arctan(1/6*c^3*x^3+7/6*c*x)-3/8*I/c^3*b*a^2/d*arctan(1/2
*c*x)-I/c^3*b^3/d*arctan(c*x)^3*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-3/2*I/c^3*b^3
/d*arctan(c*x)*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+3*I/c^3*b^3/d*arctan(c*x
)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-3*I/c^3*b^3/d*arctan(c*x)*polylog(2,-(1+I*c
*x)^2/(c^2*x^2+1))+3/4*I/c^3*b*a^2/d*arctan(1/2*c*x-1/2*I)-9/2*I/c^3*a*b^2/
d*arctan(c*x)^2+3/c^3*a*b^2/d*Pi*arctan(c*x)^2+3/c^2*a*b^2/d*arctan(c*x)^2*
x+3/c^2*b*a^2/d*arctan(c*x)*x+1/2*I/c^3*a^3/d*ln(c^2*x^2+1)-3/2*I/c^3*b^3/d
*arctan(c*x)^3+3/2/c^3*b*a^2/d+1/c^2*a^3/d*x+3/2/c^3*b^3/d*arctan(c*x)^2+3/
2/c^3*b^3/d*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+3/2/c^3*b^3/d*polylog(3,-(1
+I*c*x)^2/(c^2*x^2+1))-1/c^3*a^3/d*arctan(c*x)+3/4/c^3*b^3/d*polylog(4,-(1+
I*c*x)^2/(c^2*x^2+1))-1/2/c^3*b^3/d*arctan(c*x)^4-2/c^3*a*b^2/d*arctan(c*x)
^3+3/c^3*b^3/d*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-3/2/c^3*b^3/d*ar
ctan(c*x)^2*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))+3/c^3*a*b^2/d*arctan(c*x)+3
/2/c^3*b*a^2/d*dilog(-1/2*I*(I+c*x))-3/4/c^3*b*a^2/d*ln(c*x-I)^2-3/16/c^3*b
*a^2/d*ln(c^4*x^4+10*c^2*x^2+9)-9/8/c^3*b*a^2/d*ln(c^2*x^2+1)-3/2/c^3*a*b^2
/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csg
n((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-3/2/c^
3*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*ar
ctan(c*x)^2-3/c^3*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2
*x^2+1)+1))^2*arctan(c*x)^2+3*I/c^3*b*a^2/d*arctan(c*x)*ln(c*x-I)-3*I/c^3*a
*b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+3*I/c^3*a*b^2/d*arctan
```

```
(c*x)^2*ln(c*x-I)-3/2*I/c*b*a^2/d*arctan(c*x)*x^2-3/2*I/c*a*b^2/d*arctan(c*
x)^2*x^2+3*I/c^2*a*b^2/d*arctan(c*x)*x+3/2/c^3*a*b^2/d*Pi*csgn(I/((1+I*c*x)
^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)
)^2*arctan(c*x)^2-3/2/c^3*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+
I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2
```

maxima [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="maxima")
[Out] Timed out
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^3}{d+c\,d\,x\,1\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x))^3)/(d + c*d*x*1i),x)
[Out] int((x^2*(a + b*atan(c*x))^3)/(d + c*d*x*1i), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))**3/(d+I*c*d*x),x)
[Out] Timed out
```

3.128 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx$

Optimal. Leaf size=277

$$\frac{3b^2\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d}-\frac{3b^2\text{Li}_3\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{2c^2d}-\frac{3ib\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)^2}{2c^2d}+$$

```
[Out] (a+b*arctan(c*x))^3/c^2/d-I*x*(a+b*arctan(c*x))^3/c/d-3*I*b*(a+b*arctan(c*x
))^2*ln(2/(1+I*c*x))/c^2/d-(a+b*arctan(c*x))^3*ln(2/(1+I*c*x))/c^2/d+3*b^2*
(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/c^2/d-3/2*I*b*(a+b*arctan(c*x))^
2*polylog(2,1-2/(1+I*c*x))/c^2/d-3/2*I*b^3*polylog(3,1-2/(1+I*c*x))/c^2/d-3
/2*b^2*(a+b*arctan(c*x))*polylog(3,1-2/(1+I*c*x))/c^2/d+3/4*I*b^3*polylog(4
,1-2/(1+I*c*x))/c^2/d
```

Rubi [A] time = 0.50, antiderivative size = 277, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4866, 4846, 4920, 4854, 4884, 4994, 6610, 4998}

$$\frac{3b^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{c^2d}-\frac{3b^2\text{PolyLog}\left(3,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{2c^2d}-\frac{3ib\text{PolyLog}\left(2,1-\frac{2}{1+\cdots}\right)\cdots}{2c\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x])^3)/(d + I*c*d*x),x]
```

```
[Out] (a + b*ArcTan[c*x])^3/(c^2*d) - (I*x*(a + b*ArcTan[c*x])^3)/(c*d) - ((3*I)*
b*(a + b*ArcTan[c*x])^2*Log[2/(1 + I*c*x)])/(c^2*d) - ((a + b*ArcTan[c*x])^
3*Log[2/(1 + I*c*x)])/(c^2*d) + (3*b^2*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2
/(1 + I*c*x)])/(c^2*d) - (((3*I)/2)*b*(a + b*ArcTan[c*x])^2*PolyLog[2, 1 -
2/(1 + I*c*x)])/(c^2*d) - (((3*I)/2)*b^3*PolyLog[3, 1 - 2/(1 + I*c*x)])/(c^
2*d) - (3*b^2*(a + b*ArcTan[c*x])*PolyLog[3, 1 - 2/(1 + I*c*x)])/(2*c^2*d)
+ (((3*I)/4)*b^3*PolyLog[4, 1 - 2/(1 + I*c*x)])/(c^2*d)
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4866

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.))/((d_) + (
e_.)*(x_)), x_Symbol] :> Dist[f/e, Int[(f*x)^(m - 1)*(a + b*ArcTan[c*x])^p,
 x], x] - Dist[(d*f)/e, Int[((f*x)^(m - 1)*(a + b*ArcTan[c*x])^p)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2
, 0] && GtQ[m, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx = \frac{i\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx}{c} - \frac{i\int \left(a+b\tan^{-1}(cx)\right)^3\,dx}{cd}$$

$$= -\frac{ix\left(a+b\tan^{-1}(cx)\right)^3}{cd} - \frac{\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{c^2d} + \frac{(3ib)\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{1+c^2x^2}\,d}{d}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^3}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^3}{cd} - \frac{\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{c^2d} - \frac{3ib}{}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^3}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^3}{cd} - \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^2d} -$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^3}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^3}{cd} - \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^2d} -$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^3}{c^2d} - \frac{ix\left(a+b\tan^{-1}(cx)\right)^3}{cd} - \frac{3ib\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{c^2d} -$$

Mathematica [A] time = 0.80, size = 393, normalized size = 1.42

$$-\frac{i\left(2ia^3\log\left(c^2x^2+1\right)+4a^3cx-4a^3\tan^{-1}(cx)-6a^2b\log\left(c^2x^2+1\right)-12a^2b\tan^{-1}(cx)^2+12a^2bcx\tan^{-1}(cx)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x])^3)/(d + I*c*d*x),x]
```

```
[Out] ((-1/4*I)*(4*a^3*c*x - 4*a^3*ArcTan[c*x] + 12*a^2*b*c*x*ArcTan[c*x] - 12*a^
2*b*ArcTan[c*x]^2 - (12*I)*a*b^2*ArcTan[c*x]^2 + 12*a*b^2*c*x*ArcTan[c*x]^2
 - 8*a*b^2*ArcTan[c*x]^3 - (4*I)*b^3*ArcTan[c*x]^3 + 4*b^3*c*x*ArcTan[c*x]^
3 - 2*b^3*ArcTan[c*x]^4 - (12*I)*a^2*b*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[
c*x])] + 24*a*b^2*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - (12*I)*a*b^2
*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] + 12*b^3*ArcTan[c*x]^2*Log[1
+ E^((2*I)*ArcTan[c*x])] - (4*I)*b^3*ArcTan[c*x]^3*Log[1 + E^((2*I)*ArcTan[
c*x])] + (2*I)*a^3*Log[1 + c^2*x^2] - 6*a^2*b*Log[1 + c^2*x^2] - 6*b*(a*(a
+ (2*I)*b) + 2*(a + I*b)*b*ArcTan[c*x] + b^2*ArcTan[c*x]^2)*PolyLog[2, -E^(
(2*I)*ArcTan[c*x])] + 6*b^2*((-I)*a + b - I*b*ArcTan[c*x])*PolyLog[3, -E^((
2*I)*ArcTan[c*x])] + 3*b^3*PolyLog[4, -E^((2*I)*ArcTan[c*x])]))/(c^2*d)
```

fricas [F] time = 1.33, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b^3x\log\left(-\frac{cx+i}{cx-i}\right)^3 - 6i\,ab^2x\log\left(-\frac{cx+i}{cx-i}\right)^2 - 12\,a^2bx\log\left(-\frac{cx+i}{cx-i}\right) + 8i\,a^3x}{8\,cdx - 8i\,d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral(-(b^3*x*log(-(c*x + I)/(c*x - I))^3 - 6*I*a*b^2*x*log(-(c*x + I)/(
c*x - I))^2 - 12*a^2*b*x*log(-(c*x + I)/(c*x - I)) + 8*I*a^3*x)/(8*c*d*x -
8*I*d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.98, size = 5478, normalized size = 19.78

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))^3/(d+I*c*d*x),x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^3}{d+c\,d\,x\,1{}\mathrm{i}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x))^3)/(d + c*d*x*1i),x)
[Out] int((x*(a + b*atan(c*x))^3)/(d + c*d*x*1i), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))**3/(d+I*c*d*x),x)
[Out] Timed out
```

3.129 $\int \frac{(a+b\tan^{-1}(cx))^3}{d+icdx}\,dx$

Optimal. Leaf size=139

$$\frac{3ib^2\mathrm{Li}_3\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{3b\mathrm{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)^2}{2cd}+\frac{i\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^3}{cd}+\frac{3b^3\mathrm{L}}{}$$

```
[Out] I*(a+b*arctan(c*x))^3*ln(2/(1+I*c*x))/c/d-3/2*b*(a+b*arctan(c*x))^2*polylog
(2,1-2/(1+I*c*x))/c/d+3/2*I*b^2*(a+b*arctan(c*x))*polylog(3,1-2/(1+I*c*x))/
c/d+3/4*b^3*polylog(4,1-2/(1+I*c*x))/c/d
```

Rubi [A] time = 0.22, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4854, 4884, 4994, 4998, 6610}

$$\frac{3ib^2\mathrm{PolyLog}\left(3,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{2cd}-\frac{3b\mathrm{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{2cd}+\frac{3b^3\mathrm{PolyLog}\left(4,1-\frac{}{1}\right.}{4cd}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(d + I*c*d*x),x]
```

```
[Out] (I*(a + b*ArcTan[c*x])^3*Log[2/(1 + I*c*x)])/(c*d) - (3*b*(a + b*ArcTan[c*x
])^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(2*c*d) + (((3*I)/2)*b^2*(a + b*ArcTan[
c*x])*PolyLog[3, 1 - 2/(1 + I*c*x)])/(c*d) + (3*b^3*PolyLog[4, 1 - 2/(1 + I
*c*x)])/(4*c*d)
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{d+icdx}\,dx = \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{(3ib)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{d}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2\text{Li}_2\left(1-\frac{2}{1+icx}\right)}{2cd} + \frac{\left(3b^2\right)\int \frac{(a}{}}{}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2\text{Li}_2\left(1-\frac{2}{1+icx}\right)}{2cd} + \frac{3ib^2\left(a+\right.}{}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^3\log\left(\frac{2}{1+icx}\right)}{cd} - \frac{3b\left(a+b\tan^{-1}(cx)\right)^2\text{Li}_2\left(1-\frac{2}{1+icx}\right)}{2cd} + \frac{3ib^2\left(a+\right.}{}$$

Mathematica [A] time = 0.08, size = 133, normalized size = 0.96

$$\frac{i\left(4\log\left(\frac{2d}{d+icdx}\right)\left(a+b\tan^{-1}(cx)\right)^3+3ib\left(2\text{Li}_2\left(\frac{cx+i}{cx-i}\right)\left(a+b\tan^{-1}(cx)\right)^2-b\left(2i\text{Li}_3\left(\frac{cx+i}{cx-i}\right)\left(a+b\tan^{-1}(cx)\right)+bl\right.\right.\right.}{4cd}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(d + I*c*d*x),x]
```

```
[Out] ((I/4)*(4*(a + b*ArcTan[c*x])^3*Log[(2*d)/(d + I*c*d*x)] + (3*I)*b*(2*(a +
b*ArcTan[c*x])^2*PolyLog[2, (I + c*x)/(-I + c*x)] - b*((2*I)*(a + b*ArcTan[
c*x])*PolyLog[3, (I + c*x)/(-I + c*x)] + b*PolyLog[4, (I + c*x)/(-I + c*x)]
))))/(c*d)
```

fricas [F] time = 1.09, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b^3\log\left(-\frac{cx+i}{cx-i}\right)^3-6i\,ab^2\log\left(-\frac{cx+i}{cx-i}\right)^2-12\,a^2b\log\left(-\frac{cx+i}{cx-i}\right)+8i\,a^3}{8\,cdx-8i\,d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral(-(b^3*log(-(c*x + I)/(c*x - I))^3 - 6*I*a*b^2*log(-(c*x + I)/(c*x
- I))^2 - 12*a^2*b*log(-(c*x + I)/(c*x - I)) + 8*I*a^3)/(8*c*d*x - 8*I*d),
x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.32, size = 2044, normalized size = 14.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^3/(d+I*c*d*x),x)
```

```
[Out] 3/2/c*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*
csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2
-3/2/c*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))
*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+
3/2/c*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)
/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2/c*b^3/d*Pi*csgn((1+I*c*x)
^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)
+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*arctan(c*x)^3-3/2/c*a*b^2/d*Pi*csgn(I/((
1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x
^2+1)+1))^2*arctan(c*x)^2-I/c*b^3/d*ln(1+I*c*x)*arctan(c*x)^3+3/2*I/c*b^3/d
*arctan(c*x)*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+3/2*I/c*a*b^2/d*polylog(3,
-(1+I*c*x)^2/(c^2*x^2+1))+3/c*a*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c
^2*x^2+1))+3/2/c*a^2*b/d*dilog(1/2*I*c*x+1/2)+3/4/c*a^2*b/d*ln(1+I*c*x)^2+3
/2/c*b^3/d*arctan(c*x)^2*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-1/2*I/c*a^3/d*
ln(c^2*x^2+1)+3/2/c*a*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+
I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))*arctan(c*x)^2-3/4/c*b^3/d*polylog(4,-(1+I*c*x)^2/(c^2*x^2+1))+1/c*a^3/
d*arctan(c*x)+2/c*a*b^2/d*arctan(c*x)^3+1/2/c*b^3/d*Pi*arctan(c*x)^3+1/2/c*
b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(
1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3-1/2/c*b
^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(1
+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^3-3*I/c*a*b^
2/d*ln(1+I*c*x)*arctan(c*x)^2+3*I/c*a*b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^
2/(c^2*x^2+1))-3*I/c*a^2*b/d*ln(1+I*c*x)*arctan(c*x)-1/2/c*b^3/d*Pi*csgn((1
+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I/((1+I*c*x)^2/(c
^2*x^2+1)+1))*arctan(c*x)^3-3/2/c*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/(
(1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2
/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*csgn((1+I*c*x)^2/(c^2*x^2+1))*a
rctan(c*x)^3+3/2/c*a*b^2/d*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(
c^2*x^2+1)+1))^3*arctan(c*x)^2-3/2/c*a*b^2/d*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2
+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2/c*a*b^2/d*Pi*arctan(c*
x)^2+1/2/c*b^3/d*arctan(c*x)^4+I/c*b^3/d*arctan(c*x)^3*ln(2*I*(1+I*c*x)^2/(
c^2*x^2+1))-1/2/c*b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x
^2+1)+1))^3*arctan(c*x)^3+1/2/c*b^3/d*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^3-1/2/c*b^3/d*Pi*csgn(I*(1+I*c*x)^2
/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3-3/2/c*a^2*b/d*ln(
1/2-1/2*I*c*x)*ln(1+I*c*x)+3/2/c*a^2*b/d*ln(1/2-1/2*I*c*x)*ln(1/2*I*c*x+1/2
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\,a^3\log\left(i\,cdx+d\right)}{cd}+\frac{16\,b^3\arctan\left(cx\right)^4-b^3\log\left(c^2x^2+1\right)^4+\left(b^3c\left(\frac{4\log\left(c^2dx^2+d\right)\log\left(c^2x^2+1\right)^3}{c^2d}+\frac{4\left(\log\left(c^2x^2+1\right)^3+3\log\left(c^2x^2+\cdots\right.\right.}{c^2\cdots}\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -I*a^3*log(I*c*d*x + d)/(c*d) + 1/128*(16*b^3*arctan(c*x)^4 + 16*I*b^3*arct
an(c*x)^3*log(c^2*x^2 + 1) + 4*I*b^3*arctan(c*x)*log(c^2*x^2 + 1)^3 - b^3*l
og(c^2*x^2 + 1)^4 + 16*(b^3*arctan(c*x)^4/(c*d) + 8*b^3*c*integrate(1/16*x*
log(c^2*x^2 + 1)^3/(c^2*d*x^2 + d), x) + 8*a*b^2*arctan(c*x)^3/(c*d) + 12*a
^2*b*arctan(c*x)^2/(c*d))*c*d - 128*I*c*d*integrate(1/32*(40*b^3*c*x*arctan
(c*x)^3 + 6*b^3*c*x*arctan(c*x)*log(c^2*x^2 + 1)^2 + 96*a*b^2*c*x*arctan(c*
```

```
x)^2 + 96*a^2*b*c*x*arctan(c*x) + 12*b^3*arctan(c*x)^2*log(c^2*x^2 + 1) + b
^3*log(c^2*x^2 + 1)^3)/(c^2*d*x^2 + d), x))/(c*d)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b \operatorname{atan}(c x))^3}{d + c d x 1i} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(d + c*d*x*1i),x)
```

```
[Out] int((a + b*atan(c*x))^3/(d + c*d*x*1i), x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/(d+I*c*d*x),x)
```

```
[Out] Timed out
```

3.130 $\int \frac{(a+b\tan^{-1}(cx))^3}{x(d+icdx)}\,dx$

Optimal. Leaf size=128

$$\frac{3b^2\text{Li}_3\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{2d}+\frac{3ib\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)^2}{2d}+\frac{\log\left(2-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^3}{d}-\frac{3i\ldots}{\ldots}$$

```
[Out] (a+b*arctan(c*x))^3*ln(2-2/(1+I*c*x))/d+3/2*I*b*(a+b*arctan(c*x))^2*polylog
(2,-1+2/(1+I*c*x))/d+3/2*b^2*(a+b*arctan(c*x))*polylog(3,-1+2/(1+I*c*x))/d-
3/4*I*b^3*polylog(4,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 0.23, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4868, 4884, 4994, 4998, 6610}

$$\frac{3b^2\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{2d}+\frac{3ib\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{2d}-\frac{3ib^3\text{PolyLog}\left(4,-\ldots\right)}{4d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(x*(d + I*c*d*x)),x]
```

```
[Out] ((a + b*ArcTan[c*x])^3*Log[2 - 2/(1 + I*c*x)])/d + (((3*I)/2)*b*(a + b*ArcT
an[c*x])^2*PolyLog[2, -1 + 2/(1 + I*c*x)])/d + (3*b^2*(a + b*ArcTan[c*x])*P
olyLog[3, -1 + 2/(1 + I*c*x)])/(2*d) - (((3*I)/4)*b^3*PolyLog[4, -1 + 2/(1
+ I*c*x)])/d
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v, x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x(d+icdx)}\,dx = \frac{\left(a+b\tan^{-1}(cx)\right)^3\log\left(2-\frac{2}{1+icx}\right)}{d}-\frac{(3bc)\int\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1+icx}\right)}{1+c^2x^2}dx}{d}$$
$$=\frac{\left(a+b\tan^{-1}(cx)\right)^3\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{3ib\left(a+b\tan^{-1}(cx)\right)^2\text{Li}_2\left(-1+\frac{2}{1+icx}\right)}{2d}-\frac{(3ib^2}{}$$
$$=\frac{\left(a+b\tan^{-1}(cx)\right)^3\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{3ib\left(a+b\tan^{-1}(cx)\right)^2\text{Li}_2\left(-1+\frac{2}{1+icx}\right)}{2d}+\frac{3b^2(}{}$$
$$=\frac{\left(a+b\tan^{-1}(cx)\right)^3\log\left(2-\frac{2}{1+icx}\right)}{d}+\frac{3ib\left(a+b\tan^{-1}(cx)\right)^2\text{Li}_2\left(-1+\frac{2}{1+icx}\right)}{2d}+\frac{3b^2(}{}$$

Mathematica [B] time = 0.18, size = 311, normalized size = 2.43

$$\frac{4a^3\log\left(\frac{2i}{-cx+i}\right)+8a^3\tanh^{-1}\left(\frac{cx+i}{cx-i}\right)+12a^2b\log\left(\frac{2i}{-cx+i}\right)\tan^{-1}(cx)+24a^2b\tan^{-1}(cx)\tanh^{-1}\left(\frac{cx+i}{cx-i}\right)+6b^2\text{Li}_3\left(\frac{c}{i}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(x*(d + I*c*d*x)),x]
```

```
[Out] (8*a^3*ArcTanh[(I + c*x)/(-I + c*x)] + 24*a^2*b*ArcTan[c*x]*ArcTanh[(I + c*x)/(-I + c*x)] + 24*a*b^2*ArcTan[c*x]^2*ArcTanh[(I + c*x)/(-I + c*x)] + 8*b^3*ArcTan[c*x]^3*ArcTanh[(I + c*x)/(-I + c*x)] + 4*a^3*Log[(2*I)/(I - c*x)] + 12*a^2*b*ArcTan[c*x]*Log[(2*I)/(I - c*x)] + 12*a*b^2*ArcTan[c*x]^2*Log[(2*I)/(I - c*x)] + 4*b^3*ArcTan[c*x]^3*Log[(2*I)/(I - c*x)] + (6*I)*b*(a + b*ArcTan[c*x])^2*PolyLog[2, (I + c*x)/(I - c*x)] + 6*b^2*(a + b*ArcTan[c*x])*PolyLog[3, (I + c*x)/(I - c*x)] - (3*I)*b^3*PolyLog[4, (I + c*x)/(I - c*x)])/(4*d)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b^3\log\left(-\frac{cx+i}{cx-i}\right)^3-6i\,ab^2\log\left(-\frac{cx+i}{cx-i}\right)^2-12\,a^2b\log\left(-\frac{cx+i}{cx-i}\right)+8i\,a^3}{8\,cdx^2-8i\,dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral(-(b^3*log(-(c*x + I)/(c*x - I))^3 - 6*I*a*b^2*log(-(c*x + I)/(c*x - I))^2 - 12*a^2*b*log(-(c*x + I)/(c*x - I)) + 8*I*a^3)/(8*c*d*x^2 - 8*I*d*x), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x/(d+I*c*d*x),x, algorithm="giac")
```

[Out] Timed out

maple [C] time = 0.46, size = 3393, normalized size = 26.51

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*arctan(c*x))^3/x/(d+I*c*d*x),x)

[Out] 3/2*I*a*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-3/2*I*a*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/2*I*b^3/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3-1/2*I*b^3/d*Pi*arctan(c*x)^3*csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2-1/2*I*b^3/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3-1/2*I*b^3/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3+3/2*I*a*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-3/2*I*a*b^2/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2*I*a*b^2/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-3/2*I*a*b^2/d*Pi*arctan(c*x)^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3-3*I*a*b^2/d*Pi*arctan(c*x)^2*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2+1/2*I*b^3/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3+1/2*I*b^3/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^3-b^3/d*ln(c*x-I)*arctan(c*x)^3+b^3/d*arctan(c*x)^3*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+6*a*b^2/d*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+6*a*b^2/d*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^3/d*arctan(c*x)^3*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^3/d*arctan(c*x)^3*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-b^3/d*arctan(c*x)^3*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+6*b^3/d*arctan(c*x)*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^3/d*arctan(c*x)^3*ln(c*x)+6*b^3/d*arctan(c*x)*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*I*b^3/d*arctan(c*x)^4+6*I*b^3/d*polylog(4,(1+I*c*x)/(c^2*x^2+1)^(1/2))+6*I*b^3/d*polylog(4,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-I*a^3/d*arctan(c*x)-I*b^3/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3-1/2*I*b^3/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^3+3/2*I*b*a^2/d*ln(c*x)*ln(1+I*c*x)-3/2*I*b*a^2/d*ln(c*x)*ln(1-I*c*x)+3/2*I*b*a^2/d*ln(c*x-I)*ln(-1/2*I*(I+c*x))-6*I*a*b^2/d*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*I*a*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+9/2*I*a*b^2/d*Pi*arctan(c*x)^2-3*I*b^3/d*arctan(c*x)^2*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-3*I*b^3/d*arctan(c*x)^2*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+3/2*I*b^3/d*Pi*arctan(c*x)^3-3*b*a^2/d*ln(c*x-I)*arctan(c*x)+3*a*b^2/d*arctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))-3*a*b^2/d*ln(c*x-I)*arctan(c*x)^2+3*b*a^2/d*arctan(c*x)*ln(c*x)+3/2*I*b*a^2/d*dilog(1+I*c*x)-3/2*I*b*a^2/d*dilog(1-I*c*x)+3/2*I*b*a^2/d*dilog(-1/2*I*(I+c*x))-3/4*I*b*a^2/d*ln(c*x-I)^2+3*a*b^2/d*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*a*b^2/d*arctan(c*x)^2*ln(c*x)-3*a*b^2/d*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+3*a*b^2/d*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*a*b^2/d*arctan(c*x)^3-1/2*a^3/d*ln(c^2*x^2+1)+a^3/d*ln(c*x)-3/2*I*a*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2*I*a*b^2/d*Pi*arctan(c*x)^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2-3/2*I*a*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-3/2*I*a*b^2/d*Pi*csgn((1+I*

```
c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1
))^2*arctan(c*x)^2-3/2*I*a*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csg
n(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^
2+3/2*I*a*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2
+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arcta
n(c*x)^2+1/2*I*b^3/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*
x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x
^2+1)+1))*arctan(c*x)^3-1/2*I*b^3/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*
csgn((1+I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))*arctan(c*x)^3+1/2*I*b^3/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/
((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^3+1/2*I*b^3/d*Pi*csgn(I*((1+I*c*
x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^3-1/2*I*b^3/
d*Pi*arctan(c*x)^3*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)
)^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^3\left(\frac{\log(icx+1)}{d}-\frac{\log(x)}{d}\right)+\frac{-64i\,b^3\arctan(cx)^4+64\,b^3\arctan(cx)^3\log\left(c^2x^2+1\right)+4i\,b^3\log\left(c^2x^2+1\right)^4-}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] -a^3*(log(I*c*x + 1)/d - log(x)/d) + 1/512*(-64*I*b^3*arctan(c*x)^4 + 64*b^
3*arctan(c*x)^3*log(c^2*x^2 + 1) + 16*b^3*arctan(c*x)*log(c^2*x^2 + 1)^3 +
4*I*b^3*log(c^2*x^2 + 1)^4 - I*(64*b^3*arctan(c*x)^4/d + 6144*b^3*c^2*integ
rate(1/64*x^2*arctan(c*x)^2*log(c^2*x^2 + 1)/(c^2*d*x^3 + d*x), x) + 3*b^3*
log(c^2*x^2 + 1)^4/d + 512*a*b^2*arctan(c*x)^3/d + 768*a^2*b*arctan(c*x)^2/
d + 6144*b^3*integrate(1/64*arctan(c*x)^2*log(c^2*x^2 + 1)/(c^2*d*x^3 + d*x
), x) - 512*b^3*integrate(1/64*log(c^2*x^2 + 1)^3/(c^2*d*x^3 + d*x), x))*d
- 512*d*integrate(1/32*(12*b^3*c*x*arctan(c*x)^2*log(c^2*x^2 + 1) + b^3*c*x
*log(c^2*x^2 + 1)^3 - 96*a*b^2*arctan(c*x)^2 - 96*a^2*b*arctan(c*x) + 4*(3*
b^3*c^2*x^2 - 7*b^3)*arctan(c*x)^3 + 3*(b^3*c^2*x^2 - b^3)*arctan(c*x)*log(
c^2*x^2 + 1)^2)/(c^2*d*x^3 + d*x), x))/d
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^3}{x\,(d+c\,d\,x\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(x*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))^3/(x*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int\frac{a^3}{cx^2-ix}\,dx+\int\frac{b^3\,\mathrm{atan}^3\,(cx)}{cx^2-ix}\,dx+\int\frac{3ab^2\,\mathrm{atan}^2\,(cx)}{cx^2-ix}\,dx+\int\frac{3a^2b\,\mathrm{atan}\,(cx)}{cx^2-ix}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/x/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a**3/(c*x**2 - I*x), x) + Integral(b**3*atan(c*x)**3/(c*x**2 -
 I*x), x) + Integral(3*a*b**2*atan(c*x)**2/(c*x**2 - I*x), x) + Integral(3*
a**2*b*atan(c*x)/(c*x**2 - I*x), x))/d
```

3.131 $\int \frac{(a+b\tan^{-1}(cx))^3}{x^2(d+icdx)}\,dx$

Optimal. Leaf size=263

$$-\frac{3ib^2c\text{Li}_2\left(\frac{2}{1-icx}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{3ib^2c\text{Li}_3\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{2d}+\frac{3bc\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx\right.}{2d}$$

```
[Out] -I*c*(a+b*arctan(c*x))^3/d-(a+b*arctan(c*x))^3/d/x+3*b*c*(a+b*arctan(c*x))^
2*ln(2-2/(1-I*c*x))/d-I*c*(a+b*arctan(c*x))^3*ln(2-2/(1+I*c*x))/d-3*I*b^2*c
*(a+b*arctan(c*x))*polylog(2,-1+2/(1-I*c*x))/d+3/2*b*c*(a+b*arctan(c*x))^2*
polylog(2,-1+2/(1+I*c*x))/d+3/2*b^3*c*polylog(3,-1+2/(1-I*c*x))/d-3/2*I*b^2
*c*(a+b*arctan(c*x))*polylog(3,-1+2/(1+I*c*x))/d-3/4*b^3*c*polylog(4,-1+2/(
1+I*c*x))/d
```

Rubi [A] time = 0.60, antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {4870, 4852, 4924, 4868, 4884, 4992, 6610, 4994, 4998}

$$-\frac{3ib^2c\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{3ib^2c\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{2d}+\frac{3bc\text{PolyLog}\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(x^2*(d + I*c*d*x)),x]
```

```
[Out] ((-I)*c*(a + b*ArcTan[c*x])^3)/d - (a + b*ArcTan[c*x])^3/(d*x) + (3*b*c*(a
+ b*ArcTan[c*x])^2*Log[2 - 2/(1 - I*c*x)])/d - (I*c*(a + b*ArcTan[c*x])^3*L
og[2 - 2/(1 + I*c*x)])/d - ((3*I)*b^2*c*(a + b*ArcTan[c*x])*PolyLog[2, -1 +
 2/(1 - I*c*x)])/d + (3*b*c*(a + b*ArcTan[c*x])^2*PolyLog[2, -1 + 2/(1 + I*
c*x)])/(2*d) + (3*b^3*c*PolyLog[3, -1 + 2/(1 - I*c*x)])/(2*d) - (((3*I)/2)*
b^2*c*(a + b*ArcTan[c*x])*PolyLog[3, -1 + 2/(1 + I*c*x)])/d - (3*b^3*c*Poly
Log[4, -1 + 2/(1 + I*c*x)])/(4*d)
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
 LtQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x^2(d+icdx)}\,dx = -\left((ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x(d+icdx)}\,dx\right) + \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x^2}\,dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^3}{dx} - \frac{ic\left(a+b\tan^{-1}(cx)\right)^3\log\left(2-\frac{2}{1+icx}\right)}{d} + \frac{(3bc)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x\left(1+c^2x^2\right)}\,dx}{d}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^3}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^3}{dx} - \frac{ic\left(a+b\tan^{-1}(cx)\right)^3\log\left(2-\frac{2}{1+icx}\right)}{d} + $$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^3}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^3}{dx} + \frac{3bc\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1-icx}\right)}{d} - $$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^3}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^3}{dx} + \frac{3bc\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1-icx}\right)}{d} - $$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^3}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^3}{dx} + \frac{3bc\left(a+b\tan^{-1}(cx)\right)^2\log\left(2-\frac{2}{1-icx}\right)}{d} - $$

Mathematica [A] time = 1.49, size = 436, normalized size = 1.66

$$-\frac{-ia^3c\log\left(c^2x^2+1\right)+2ia^3c\log(x)+2a^3c\tan^{-1}(cx)+\frac{2a^3}{x}+3a^2bc\left(2\left(-\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)+\tan^{-1}(cx)^2+\tan^{-1}(cx\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(x^2*(d + I*c*d*x)),x]
```

```
[Out] -1/2*((2*a^3)/x + 2*a^3*c*ArcTan[c*x] + (2*I)*a^3*c*Log[x] - I*a^3*c*Log[1
+ c^2*x^2] + 3*a^2*b*c*(2*(ArcTan[c*x]^2 + ArcTan[c*x]*(1/(c*x) + I*Log[1 -
 E^((2*I)*ArcTan[c*x])]) - Log[(c*x)/Sqrt[1 + c^2*x^2]]) + PolyLog[2, E^((2
*I)*ArcTan[c*x])]) + (6*I)*a*b^2*c*((-1/24*I)*Pi^3 + ArcTan[c*x]^2 - (I*Arc
Tan[c*x]^2)/(c*x) + ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] + (2*I)*A
rcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + I*ArcTan[c*x]*PolyLog[2, E^((-2
*I)*ArcTan[c*x])] + PolyLog[2, E^((2*I)*ArcTan[c*x])] + PolyLog[3, E^((-2*I
)*ArcTan[c*x])]/2) + (2*I)*b^3*c*(Pi^3/8 - (I/64)*Pi^4 - ArcTan[c*x]^3 - (I
*ArcTan[c*x]^3)/(c*x) + (3*I)*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])]
 + ArcTan[c*x]^3*Log[1 - E^((-2*I)*ArcTan[c*x])] + ((3*I)/2)*ArcTan[c*x]*(2
*I + ArcTan[c*x])*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + (3*(I + ArcTan[c*x])
*PolyLog[3, E^((-2*I)*ArcTan[c*x])])/2 - ((3*I)/4)*PolyLog[4, E^((-2*I)*Arc
Tan[c*x])]))/d
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(-\frac{b^3\log\left(-\frac{cx+i}{cx-i}\right)^3-6i\,ab^2\log\left(-\frac{cx+i}{cx-i}\right)^2-12\,a^2b\log\left(-\frac{cx+i}{cx-i}\right)+8i\,a^3}{8\,cdx^3-8i\,dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x^2/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral(-(b^3*log(-(c*x + I)/(c*x - I))^3 - 6*I*a*b^2*log(-(c*x + I)/(c*x
- I))^2 - 12*a^2*b*log(-(c*x + I)/(c*x - I)) + 8*I*a^3)/(8*c*d*x^3 - 8*I*d*
x^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x^2/(d+I*c*d*x),x, algorithm="giac")
[Out] Timed out
```

maple [C] time = 1.32, size = 11233, normalized size = 42.71

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^3/x^2/(d+I*c*d*x),x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x^2/(d+I*c*d*x),x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^3}{x^2\,(d + c\,d\,x\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(x^2*(d + c*d*x*1i)),x)
[Out] int((a + b*atan(c*x))^3/(x^2*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a^3}{cx^3-ix^2}\,dx + \int \frac{b^3\,\mathrm{atan}^3\,(cx)}{cx^3-ix^2}\,dx + \int \frac{3ab^2\,\mathrm{atan}^2\,(cx)}{cx^3-ix^2}\,dx + \int \frac{3a^2b\,\mathrm{atan}\,(cx)}{cx^3-ix^2}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/x**2/(d+I*c*d*x),x)
[Out] -I*(Integral(a**3/(c*x**3 - I*x**2), x) + Integral(b**3*atan(c*x)**3/(c*x**
3 - I*x**2), x) + Integral(3*a*b**2*atan(c*x)**2/(c*x**3 - I*x**2), x) + In
tegral(3*a**2*b*atan(c*x)/(c*x**3 - I*x**2), x))/d
```

3.132 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x^3(d+icdx)}\,dx$

Optimal. Leaf size=414

$$-\frac{3b^2c^2\text{Li}_2\left(\frac{2}{1-icx}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{3b^2c^2\text{Li}_3\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{2d}+\frac{3b^2c^2\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}\right.}{d}$$

```
[Out] -3/2*I*b*c^2*(a+b*arctan(c*x))^2/d-3/2*b*c*(a+b*arctan(c*x))^2/d/x-3/2*c^2*
(a+b*arctan(c*x))^3/d-1/2*(a+b*arctan(c*x))^3/d/x^2+I*c*(a+b*arctan(c*x))^3
/d/x+3*b^2*c^2*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))/d-3*I*b*c^2*(a+b*arctan(
c*x))^2*ln(2-2/(1-I*c*x))/d-c^2*(a+b*arctan(c*x))^3*ln(2-2/(1+I*c*x))/d-3/2
*I*b^3*c^2*polylog(2,-1+2/(1-I*c*x))/d-3*b^2*c^2*(a+b*arctan(c*x))*polylog(
2,-1+2/(1-I*c*x))/d-3/2*I*b*c^2*(a+b*arctan(c*x))^2*polylog(2,-1+2/(1+I*c*x
))/d-3/2*I*b^3*c^2*polylog(3,-1+2/(1-I*c*x))/d-3/2*b^2*c^2*(a+b*arctan(c*x)
)*polylog(3,-1+2/(1+I*c*x))/d+3/4*I*b^3*c^2*polylog(4,-1+2/(1+I*c*x))/d
```

Rubi [A] time = 1.02, antiderivative size = 414, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 11, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.440, Rules used = {4870, 4852, 4918, 4924, 4868, 2447, 4884, 4992, 6610, 4994, 4998}

$$-\frac{3b^2c^2\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{3b^2c^2\text{PolyLog}\left(3,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{2d}-\frac{3ibc^2\text{PolyLo}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^3/(x^3*(d + I*c*d*x)),x]
```

```
[Out] (((-3*I)/2)*b*c^2*(a + b*ArcTan[c*x])^2)/d - (3*b*c*(a + b*ArcTan[c*x])^2)/
(2*d*x) - (3*c^2*(a + b*ArcTan[c*x])^3)/(2*d) - (a + b*ArcTan[c*x])^3/(2*d*
x^2) + (I*c*(a + b*ArcTan[c*x])^3)/(d*x) + (3*b^2*c^2*(a + b*ArcTan[c*x])*L
og[2 - 2/(1 - I*c*x)])/d - ((3*I)*b*c^2*(a + b*ArcTan[c*x])^2*Log[2 - 2/(1
- I*c*x)])/d - (c^2*(a + b*ArcTan[c*x])^3*Log[2 - 2/(1 + I*c*x)])/d - (((3*
I)/2)*b^3*c^2*PolyLog[2, -1 + 2/(1 - I*c*x)])/d - (3*b^2*c^2*(a + b*ArcTan[
c*x])*PolyLog[2, -1 + 2/(1 - I*c*x)])/d - (((3*I)/2)*b*c^2*(a + b*ArcTan[c*
x])^2*PolyLog[2, -1 + 2/(1 + I*c*x)])/d - (((3*I)/2)*b^3*c^2*PolyLog[3, -1
+ 2/(1 - I*c*x)])/d - (3*b^2*c^2*(a + b*ArcTan[c*x])*PolyLog[3, -1 + 2/(1 +
 I*c*x)])/(2*d) + (((3*I)/4)*b^3*c^2*PolyLog[4, -1 + 2/(1 + I*c*x)])/d
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
```

```
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4870

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x], x]
 - Dist[e/(d*f), Int[((f*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d + e*x), x], x
] /; FreeQ[{a, b, c, d, e, f}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0] &&
 LtQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
```

```
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x^3(d+icdx)}\,dx = -\left((ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x^2(d+icdx)}\,dx\right) + \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x^3}\,dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^3}{2dx^2} - c^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x(d+icdx)}\,dx - \frac{(ic)\int \frac{\left(a+b\tan^{-1}(cx)\right)^3}{x^2}\,dx}{d} + \frac{(3bc)\int}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^3}{2dx^2} + \frac{ic\left(a+b\tan^{-1}(cx)\right)^3}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^3\log\left(2-\frac{2}{1+icx}\right)}{d} +$$

$$= -\frac{3bc\left(a+b\tan^{-1}(cx)\right)^2}{2dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^3}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^3}{2dx^2} + \frac{ic\left(a+b\tan\right.}{dx}$$

$$= -\frac{3ibc^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{3bc\left(a+b\tan^{-1}(cx)\right)^2}{2dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^3}{2d} - \frac{\left(a+b\right.}{}$$

$$= -\frac{3ibc^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{3bc\left(a+b\tan^{-1}(cx)\right)^2}{2dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^3}{2d} - \frac{\left(a+b\right.}{}$$

$$= -\frac{3ibc^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{3bc\left(a+b\tan^{-1}(cx)\right)^2}{2dx} - \frac{3c^2\left(a+b\tan^{-1}(cx)\right)^3}{2d} - \frac{\left(a+b\right.}{}$$

Mathematica [A] time = 2.64, size = 634, normalized size = 1.53

$$a^3c^2\log\left(c^2x^2+1\right) - 2a^3c^2\log(x) + 2ia^3c^2\tan^{-1}(cx) + \frac{2ia^3c}{x} - \frac{a^3}{x^2} + \frac{3ia^2b\left(c^2x^2\mathrm{Li}_2\left(e^{2i\tan^{-1}(cx)}\right)+cx\left(-2cx\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)+i\right)+2c^2\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^3/(x^3*(d + I*c*d*x)),x]
```

```
[Out] (-(a^3/x^2) + ((2*I)*a^3*c)/x + (2*I)*a^3*c^2*ArcTan[c*x] - 2*a^3*c^2*Log[x
] + a^3*c^2*Log[1 + c^2*x^2] + ((3*I)*a^2*b*(2*c^2*x^2*ArcTan[c*x]^2 + ArcT
an[c*x]*(I + 2*c*x + I*c^2*x^2 + (2*I)*c^2*x^2*Log[1 - E^((2*I)*ArcTan[c*x]
)]) + c*x*(I - 2*c*x*Log[(c*x)/Sqrt[1 + c^2*x^2]]) + c^2*x^2*PolyLog[2, E^(
(2*I)*ArcTan[c*x])]))/x^2 + 6*a*b^2*c^2*((I/24)*Pi^3 - ArcTan[c*x]/(c*x) -
(3*ArcTan[c*x]^2)/2 - ArcTan[c*x]^2/(2*c^2*x^2) + (I*ArcTan[c*x]^2)/(c*x) -
 ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - (2*I)*ArcTan[c*x]*Log[1 -
E^((2*I)*ArcTan[c*x])] + Log[(c*x)/Sqrt[1 + c^2*x^2]] - I*ArcTan[c*x]*PolyL
og[2, E^((-2*I)*ArcTan[c*x])] - PolyLog[2, E^((2*I)*ArcTan[c*x])] - PolyLog
[3, E^((-2*I)*ArcTan[c*x])]/2) + 2*b^3*c^2*(-1/8*Pi^3 + (I/64)*Pi^4 - ((3*I
)/2)*ArcTan[c*x]^2 - (3*ArcTan[c*x]^2)/(2*c*x) + ArcTan[c*x]^3 + (I*ArcTan[
c*x]^3)/(c*x) - ((1 + c^2*x^2)*ArcTan[c*x]^3)/(2*c^2*x^2) - (3*I)*ArcTan[c*
x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - ArcTan[c*x]^3*Log[1 - E^((-2*I)*ArcT
an[c*x])] + 3*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + (3*(2 - I*ArcTan
[c*x])*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])])/2 - ((3*I)/2)*PolyLo
g[2, E^((2*I)*ArcTan[c*x])] - (3*(I + ArcTan[c*x])*PolyLog[3, E^((-2*I)*Arc
Tan[c*x])])/2 + ((3*I)/4)*PolyLog[4, E^((-2*I)*ArcTan[c*x])]))/(2*d)
```

fricas [F] time = 0.79, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{b^3\log\left(-\frac{cx+i}{cx-i}\right)^3-6i\,ab^2\log\left(-\frac{cx+i}{cx-i}\right)^2-12\,a^2b\log\left(-\frac{cx+i}{cx-i}\right)+8i\,a^3}{8\,cdx^4-8i\,dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x^3/(d+I*c*d*x),x, algorithm="fricas")
```

```
[Out] integral(-(b^3*log(-(c*x + I)/(c*x - I))^3 - 6*I*a*b^2*log(-(c*x + I)/(c*x
- I))^2 - 12*a^2*b*log(-(c*x + I)/(c*x - I)) + 8*I*a^3)/(8*c*d*x^4 - 8*I*d*
x^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x^3/(d+I*c*d*x),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 21.30, size = 3058, normalized size = 7.39

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^3/x^3/(d+I*c*d*x),x)
```

```
[Out] 3*I*c^2*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)
)^2*arctan(c*x)^2-3/2*I*c^2*a*b^2/d*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2/(c
^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3+3/2*I*c^2*a*b^2/d*Pi*csgn(((1+I
*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-3/2*I*c
^2*a*b^2/d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))
^3*arctan(c*x)^2+3/2*I*c^2*a*b^2/d*Pi*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*
x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-3/2*I*c^2*a^2*b/d*dilog(1+I*c*x)+3/2*I
*c^2*a^2*b/d*dilog(1-I*c*x)-3/2*I*c^2*a^2*b/d*dilog(-1/2*I*(I+c*x))+3/4*I*c
^2*a^2*b/d*ln(c*x-I)^2-3*I*c^2*a*b^2/d*arctan(c*x)+2*I*c^2*a*b^2/d*arctan(c
*x)^3-3*c^2*a*b^2/d*arctan(c*x)^2*ln(c*x)+3*c^2*a*b^2/d*arctan(c*x)^2*ln((1
+I*c*x)^2/(c^2*x^2+1)-1)-3*c^2*a*b^2/d*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^
2+1)^(1/2))-3*c^2*a^2*b/d*arctan(c*x)*ln(c*x)+3/2*I*c^2*a*b^2/d*Pi*csgn((1+
I*c*x)^2/(c^2*x^2+1))*csgn((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)
+1))^2*arctan(c*x)^2-3/2*I*c^2*a*b^2/d*arctan(c*x)^2*Pi*csgn(I*((1+I*c*x)^2
/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-
1)/((1+I*c*x)^2/(c^2*x^2+1)+1))+3/2*I*c^2*a*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c
^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1
))^2*arctan(c*x)^2+3/2*I*c^2*a*b^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))
*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c
*x)^2-3/2*I*c^2*a*b^2/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*
x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+3/2*I*c^2*a*b
^2/d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csg
n(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-
6*I*c^2*b^3/d*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-3/2*I*c^2*b^3/d*arcta
n(c*x)^2-3/2*c*a^2*b/d/x-1/2*a^3/d/x^2-3/2*I*c^2*a*b^2/d*arctan(c*x)^2*Pi*c
sgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn
(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))+3/2*I*c^2*a*b^2
/d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn((1+I*c*x)^2/(c^2*x^2+1))*csg
n((1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+6*c^2*
```

```
a*b^2/d*dilog((1+I*c*x)/(c^2*x^2+1)^(1/2))-6*c^2*a*b^2/d*polylog(3,(1+I*c*x
)/(c^2*x^2+1)^(1/2))-6*c^2*a*b^2/d*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-
3/2*c^2*a^2*b/d*arctan(c*x)+I*c^2*a^3/d*arctan(c*x)+I*c*a^3/d/x-3/2*c*b^3/d
*arctan(c*x)^2/x-3/2*a^2*b/d*arctan(c*x)/x^2-3/2*a*b^2/d*arctan(c*x)^2/x^2-
3*I*c^2*b^3/d*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2*I*c^2*b^3/d*arctan
(c*x)^4-3*I*c^2*b^3/d*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*I*c^2*b^3/d
*polylog(4,(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*I*c^2*b^3/d*polylog(4,-(1+I*c*x)/
(c^2*x^2+1)^(1/2))-6*I*c^2*b^3/d*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))-3/2
*c^2*b^3/d*arctan(c*x)^3+1/2*c^2*a^3/d*ln(c^2*x^2+1)-c^2*a^3/d*ln(c*x)-1/2*
b^3/d*arctan(c*x)^3/x^2+3*c^2*a^2*b/d*arctan(c*x)*ln(c*x-I)-3*c^2*a*b^2/d*a
rctan(c*x)^2*ln(2*I*(1+I*c*x)^2/(c^2*x^2+1))+3*c^2*a*b^2/d*ln(c*x-I)*arctan
(c*x)^2-3*c^2*a*b^2/d*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-3*c*a
*b^2/d*arctan(c*x)/x+I*c*b^3/d*arctan(c*x)^3/x-3*I*c^2*b^3/d*arctan(c*x)^2*
ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-3*I*c^2*b^3/d*arctan(c*x)^2*ln(1-(1+I*c*x
)/(c^2*x^2+1)^(1/2))+3*I*c^2*b^3/d*arctan(c*x)^2*polylog(2,(1+I*c*x)/(c^2*x
^2+1)^(1/2))+3*I*c^2*b^3/d*arctan(c*x)^2*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(
1/2))-3*I*c^2*a^2*b/d*ln(c*x)+3/2*I*c^2*a^2*b/d*ln(c^2*x^2+1)-6*c^2*b^3/d*a
rctan(c*x)*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*c^2*b^3/d*arctan(c*x)*l
n(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*c^2*b^3/d*arctan(c*x)*polylog(3,-(1+I*c*
x)/(c^2*x^2+1)^(1/2))+3*c^2*b^3/d*arctan(c*x)*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1
/2))-6*c^2*b^3/d*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-c^2*b^
3/d*arctan(c*x)^3*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-c^2*b^3/d*arctan(c*x)^3
*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-6*c^2*b^3/d*arctan(c*x)*polylog(2,(1+I*c
*x)/(c^2*x^2+1)^(1/2))+3*c^2*a*b^2/d*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)-6*c^
2*a*b^2/d*dilog(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-9/2*c^2*a*b^2/d*arctan(c*x)^
2+3*c^2*a*b^2/d*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+3*I*c*a^2*b/d*arctan(c*x)
/x+3*I*c*a*b^2/d*arctan(c*x)^2/x-9/2*I*c^2*a*b^2/d*arctan(c*x)^2*Pi+6*I*c^2
*a*b^2/d*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+6*I*c^2*a*b^2/
d*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))-3/2*I*c^2*a^2*b/d*ln(c
*x)*ln(1+I*c*x)+3/2*I*c^2*a^2*b/d*ln(c*x)*ln(1-I*c*x)-3/2*I*c^2*a^2*b/d*ln(
-1/2*I*(I+c*x))*ln(c*x-I)-6*I*c^2*a*b^2/d*arctan(c*x)*ln(1+(1+I*c*x)/(c^2*x
^2+1)^(1/2))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^3/x^3/(d+I*c*d*x),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^3}{x^3\,(d+c\,d\,x\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^3/(x^3*(d + c*d*x*1i)),x)
```

```
[Out] int((a + b*atan(c*x))^3/(x^3*(d + c*d*x*1i)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\left(\int \frac{a^3}{cx^4-ix^3}\,dx+\int \frac{b^3\,\mathrm{atan}^3\,(cx)}{cx^4-ix^3}\,dx+\int \frac{3ab^2\,\mathrm{atan}^2\,(cx)}{cx^4-ix^3}\,dx+\int \frac{3a^2b\,\mathrm{atan}\,(cx)}{cx^4-ix^3}\,dx\right)}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**3/x**3/(d+I*c*d*x),x)
```

```
[Out] -I*(Integral(a**3/(c*x**4 - I*x**3), x) + Integral(b**3*atan(c*x)**3/(c*x**
4 - I*x**3), x) + Integral(3*a*b**2*atan(c*x)**2/(c*x**4 - I*x**3), x) + In
tegral(3*a**2*b*atan(c*x)/(c*x**4 - I*x**3), x))/d
```

3.133 $\int \frac{1}{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{(d+icdx)\left(a+b\tan^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable(1/(d+I*c*d*x)/(a+b*arctan(c*x)),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + I*c*d*x)*(a + b*ArcTan[c*x])),x]
[Out] Defer[Int][1/((d + I*c*d*x)*(a + b*ArcTan[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}\,dx=\int \frac{1}{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 3.40, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+icdx)\left(a+b\tan^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + I*c*d*x)*(a + b*ArcTan[c*x])),x]
[Out] Integrate[1/((d + I*c*d*x)*(a + b*ArcTan[c*x])), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(-\frac{2}{-2i\,acdx-2\,ad+(bcdx-i\,bd)\log\left(-\frac{cx+i}{cx-i}\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d+I*c*d*x)/(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral(-2/(-2*I*a*c*d*x - 2*a*d + (b*c*d*x - I*b*d)*log(-(c*x + I)/(c*x -
 I))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d+I*c*d*x)/(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.47, size = 0, normalized size = 0.00

$$\int \frac{1}{(icdx + d)(a + b\arctan(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(d+I*c*d*x)/(a+b*arctan(c*x)),x)
[Out] int(1/(d+I*c*d*x)/(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(i\,cdx + d)(b\arctan(cx) + a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d+I*c*d*x)/(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate(1/((I*c*d*x + d)*(b*arctan(c*x) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{(a + b\,\mathrm{atan}(c\,x))\,(d + c\,d\,x\,1\mathrm{i})}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*atan(c*x))*(d + c*d*x*1i)),x)
[Out] int(1/((a + b*atan(c*x))*(d + c*d*x*1i)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{i\int \frac{1}{acx - ia + bcx\,\mathrm{atan}(cx) - ib\,\mathrm{atan}(cx)}\,dx}{d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(d+I*c*d*x)/(a+b*atan(c*x)),x)
[Out] -I*Integral(1/(a*c*x - I*a + b*c*x*atan(c*x) - I*b*atan(c*x)), x)/d
```

3.134 $\int \frac{x^3(a+b\tan^{-1}(cx))}{d+ex}\,dx$

Optimal. Leaf size=297

$$\frac{d^3\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^4}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e^4}-\frac{dx^2\left(a+b\tan^{-1}(cx)\right)}{2e^2}+\frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3e}$$

```
[Out] a*d^2*x/e^3+1/2*b*d*x/c/e^2-1/6*b*x^2/c/e-1/2*b*d*arctan(c*x)/c^2/e^2+b*d^2
*x*arctan(c*x)/e^3-1/2*d*x^2*(a+b*arctan(c*x))/e^2+1/3*x^3*(a+b*arctan(c*x)
)/e+d^3*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/e^4-d^3*(a+b*arctan(c*x))*ln(2*c*
(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^4-1/2*b*d^2*ln(c^2*x^2+1)/c/e^3+1/6*b*ln(c^2
*x^2+1)/c^3/e-1/2*I*b*d^3*polylog(2,1-2/(1-I*c*x))/e^4+1/2*I*b*d^3*polylog(
2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^4
```

Rubi [A] time = 0.27, antiderivative size = 297, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.632, Rules used = {4876, 4846, 260, 4852, 321, 203, 266, 43, 4856, 2402, 2315, 2447}

$$-\frac{ibd^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e^4}+\frac{ibd^3\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{2e^4}+\frac{d^3\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^4}-\frac{d^3\left(a+b\tan^{-1}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + e*x),x]
```

```
[Out] (a*d^2*x)/e^3 + (b*d*x)/(2*c*e^2) - (b*x^2)/(6*c*e) - (b*d*ArcTan[c*x])/(2*
c^2*e^2) + (b*d^2*x*ArcTan[c*x])/e^3 - (d*x^2*(a + b*ArcTan[c*x]))/(2*e^2)
+ (x^3*(a + b*ArcTan[c*x]))/(3*e) + (d^3*(a + b*ArcTan[c*x])*Log[2/(1 - I*c
*x)])/e^4 - (d^3*(a + b*ArcTan[c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 -
I*c*x))])/e^4 - (b*d^2*Log[1 + c^2*x^2])/(2*c*e^3) + (b*Log[1 + c^2*x^2])/(
6*c^3*e) - ((I/2)*b*d^3*PolyLog[2, 1 - 2/(1 - I*c*x)])/e^4 + ((I/2)*b*d^3*P
olyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e^4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{d+ex}\,dx = \int\left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{e^3} - \frac{dx\left(a+b\tan^{-1}(cx)\right)}{e^2} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{e} - \frac{d^3\left(a+b\,\mathrm{ta}\right.}{e^3(d+}\right.$$

$$= \frac{d^2\int\left(a+b\tan^{-1}(cx)\right)dx}{e^3} - \frac{d^3\int\frac{a+b\tan^{-1}(cx)}{d+ex}dx}{e^3} - \frac{d\int x\left(a+b\tan^{-1}(cx)\right)dx}{e^2} + \frac{\int x^2}{}$$

$$= \frac{ad^2x}{e^3} - \frac{dx^2\left(a+b\tan^{-1}(cx)\right)}{2e^2} + \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3e} + \frac{d^3\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-ic}\right.}{e^4}$$

$$= \frac{ad^2x}{e^3} + \frac{bdx}{2ce^2} + \frac{bd^2x\tan^{-1}(cx)}{e^3} - \frac{dx^2\left(a+b\tan^{-1}(cx)\right)}{2e^2} + \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3e} + \frac{d^3}{}$$

$$= \frac{ad^2x}{e^3} + \frac{bdx}{2ce^2} - \frac{bd\tan^{-1}(cx)}{2c^2e^2} + \frac{bd^2x\tan^{-1}(cx)}{e^3} - \frac{dx^2\left(a+b\tan^{-1}(cx)\right)}{2e^2} + \frac{x^3\left(a+b\,\mathrm{ta}\right.}{3e}$$

$$= \frac{ad^2x}{e^3} + \frac{bdx}{2ce^2} - \frac{bx^2}{6ce} - \frac{bd\tan^{-1}(cx)}{2c^2e^2} + \frac{bd^2x\tan^{-1}(cx)}{e^3} - \frac{dx^2\left(a+b\tan^{-1}(cx)\right)}{2e^2} + \frac{x^3\left(\right.}{}$$

Mathematica [A] time = 3.57, size = 484, normalized size = 1.63

$$-\frac{6ad^3\log(d+ex) - 6ad^2ex + 3ade^2x^2 - 2ae^3x^3 + \frac{be^3}{c^3} + \frac{3}{2}\pi bd^3\log\left(c^2x^2+1\right) - \frac{3bd^2e\sqrt{\frac{c^2d^2}{e^2}+1}\,\tan^{-1}(cx)^2e^{i\tan^{-1}\left(\frac{cd}{e}\right)}}{c} + \frac{3}{}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + e*x),x]
```

```
[Out] -1/6*((b*e^3)/c^3 - 6*a*d^2*e*x - (3*b*d*e^2*x)/c + 3*a*d*e^2*x^2 + (b*e^3*
x^2)/c - 2*a*e^3*x^3 + (3*b*d*e^2*ArcTan[c*x])/c^2 + (3*I)*b*d^3*Pi*ArcTan[
c*x] - 6*b*d^2*e*x*ArcTan[c*x] + 3*b*d*e^2*x^2*ArcTan[c*x] - 2*b*e^3*x^3*Ar
cTan[c*x] - (6*I)*b*d^3*ArcTan[(c*d)/e]*ArcTan[c*x] + (3*I)*b*d^3*ArcTan[c*
x]^2 + (3*b*d^2*e*ArcTan[c*x]^2)/c - (3*b*d^2*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(
I*ArcTan[(c*d)/e])*ArcTan[c*x]^2)/c + 3*b*d^3*Pi*Log[1 + E^((-2*I)*ArcTan[c
*x])] - 6*b*d^3*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 6*b*d^3*ArcTan
[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 6*b*d^3*ArcT
an[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 6*a*d^3*Log[d
+ e*x] + (3*b*d^2*e*Log[1 + c^2*x^2])/c - (b*e^3*Log[1 + c^2*x^2])/c^3 + (3
*b*d^3*Pi*Log[1 + c^2*x^2])/2 - 6*b*d^3*ArcTan[(c*d)/e]*Log[Sin[ArcTan[(c*d
)/e] + ArcTan[c*x]]] + (3*I)*b*d^3*PolyLog[2, -E^((2*I)*ArcTan[c*x])] - (3*
I)*b*d^3*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))])/e^4
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^3\arctan(cx) + ax^3}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arctan(c*x) + a*x^3)/(e*x + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x+d),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.06, size = 394, normalized size = 1.33

$$\frac{a\,x^{3}}{3e}-\frac{a\,x^{2}d}{2e^{2}}+\frac{a\,d^{2}x}{e^{3}}-\frac{a\,d^{3}\ln\left(cex+dc\right)}{e^{4}}+\frac{b\arctan\left(cx\right)x^{3}}{3e}-\frac{b\arctan\left(cx\right)x^{2}d}{2e^{2}}+\frac{b\,d^{2}x\arctan\left(cx\right)}{e^{3}}-\frac{b\arctan\left(cx\right)d^{3}}{e^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(e*x+d),x)
[Out] 1/3*a/e*x^3-1/2*a/e^2*x^2*d+a*d^2*x/e^3-a*d^3/e^4*ln(c*e*x+c*d)+1/3*b*arcta
n(c*x)/e*x^3-1/2*b*arctan(c*x)/e^2*x^2*d+b*d^2*x*arctan(c*x)/e^3-b*arctan(c
*x)*d^3/e^4*ln(c*e*x+c*d)-1/2/c*b/e^3*ln(c^2*d^2-2*(c*e*x+c*d)*c*d+(c*e*x+c
*d)^2+e^2)*d^2-1/2*b*d*arctan(c*x)/c^2/e^2+1/6/c^3*b/e*ln(c^2*d^2-2*(c*e*x+
c*d)*c*d+(c*e*x+c*d)^2+e^2)+1/2*b*d*x/c/e^2+2/3/c*b*d^2/e^3-1/6*b*x^2/c/e-1
/2*I*b/e^4*d^3*ln(c*e*x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))+1/2*I*b/e^4*d^3*ln(c
*e*x+c*d)*ln((I*e+c*e*x)/(I*e-d*c))-1/2*I*b/e^4*d^3*dilog((I*e-c*e*x)/(d*c+
I*e))+1/2*I*b/e^4*d^3*dilog((I*e+c*e*x)/(I*e-d*c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}\,a\left(\frac{6\,d^{3}\log\left(ex+d\right)}{e^{4}}-\frac{2\,e^{2}x^{3}-3\,dex^{2}+6\,d^{2}x}{e^{3}}\right)+2\,b\int\frac{x^{3}\arctan\left(cx\right)}{2\left(ex+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x+d),x, algorithm="maxima")
[Out] -1/6*a*(6*d^3*log(e*x + d)/e^4 - (2*e^2*x^3 - 3*d*e*x^2 + 6*d^2*x)/e^3) + 2
*b*integrate(1/2*x^3*arctan(c*x)/(e*x + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^{3}\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + e*x),x)
[Out] int((x^3*(a + b*atan(c*x)))/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^{3}\left(a+b\,\mathrm{atan}\left(cx\right)\right)}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(e*x+d),x)
[Out] Integral(x**3*(a + b*atan(c*x))/(d + e*x), x)
```

3.135 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{d+ex}\,dx$

Optimal. Leaf size=237

$$-\frac{d^2\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^3}+\frac{d^2\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e^3}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e}-\frac{adx}{e^2}+\frac{bd\log\left(c^2x\right.}{2ce^2}$$

```
[Out] -a*d*x/e^2-1/2*b*x/c/e+1/2*b*arctan(c*x)/c^2/e-b*d*x*arctan(c*x)/e^2+1/2*x^
2*(a+b*arctan(c*x))/e-d^2*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/e^3+d^2*(a+b*ar
ctan(c*x))*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^3+1/2*b*d*ln(c^2*x^2+1)/c/
e^2+1/2*I*b*d^2*polylog(2,1-2/(1-I*c*x))/e^3-1/2*I*b*d^2*polylog(2,1-2*c*(e
*x+d)/(c*d+I*e)/(1-I*c*x))/e^3
```

Rubi [A] time = 0.21, antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.526, Rules used = {4876, 4846, 260, 4852, 321, 203, 4856, 2402, 2315, 2447}

$$\frac{ibd^2\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e^3}-\frac{ibd^2\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{2e^3}-\frac{d^2\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^3}+\frac{d^2\left(a+b\tan^{-1}(c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + e*x),x]
```

```
[Out] -((a*d*x)/e^2) - (b*x)/(2*c*e) + (b*ArcTan[c*x])/(2*c^2*e) - (b*d*x*ArcTan[
c*x])/e^2 + (x^2*(a + b*ArcTan[c*x]))/(2*e) - (d^2*(a + b*ArcTan[c*x])*Log[
2/(1 - I*c*x)])/e^3 + (d^2*(a + b*ArcTan[c*x])*Log[(2*c*(d + e*x))/((c*d +
I*e)*(1 - I*c*x))])/e^3 + (b*d*Log[1 + c^2*x^2])/(2*c*e^2) + ((I/2)*b*d^2*P
olyLog[2, 1 - 2/(1 - I*c*x)])/e^3 - ((I/2)*b*d^2*PolyLog[2, 1 - (2*c*(d + e
*x))/((c*d + I*e)*(1 - I*c*x))])/e^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{d+ex}\,dx = \int \left(-\frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{e}+\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{e^2(d+ex)}\right)dx$$

$$= -\frac{d\int\left(a+b\tan^{-1}(cx)\right)dx}{e^2}+\frac{d^2\int\frac{a+b\tan^{-1}(cx)}{d+ex}\,dx}{e^2}+\frac{\int x\left(a+b\tan^{-1}(cx)\right)dx}{e}$$

$$= -\frac{adx}{e^2}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e^3}+\frac{d^2\left(a+b\tan^{-1}\right.}{}$$

$$= -\frac{adx}{e^2}-\frac{bx}{2ce}-\frac{bdx\tan^{-1}(cx)}{e^2}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{\cdot}{1\cdot}\right.}{e^3}$$

$$= -\frac{adx}{e^2}-\frac{bx}{2ce}+\frac{b\tan^{-1}(cx)}{2c^2e}-\frac{bdx\tan^{-1}(cx)}{e^2}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e}-\frac{d^2\left(a+b\tan\right.}{}$$

Mathematica [A] time = 1.68, size = 404, normalized size = 1.70

$$2ad^2\log(d+ex)-2adex+ae^2x^2-\frac{bde\sqrt{\frac{c^2d^2}{e^2}+1}\tan^{-1}(cx)^2e^{i\tan^{-1}\left(\frac{cd}{e}\right)}}{c}+\frac{1}{2}\pi bd^2\log\left(c^2x^2+1\right)+\frac{bde\log\left(c^2x^2+1\right)}{c}+\frac{be^2\tan^{-1}}{c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + e*x),x]
```

```
[Out] (-2*a*d*e*x - (b*e^2*x)/c + a*e^2*x^2 + (b*e^2*ArcTan[c*x])/c^2 + I*b*d^2*P
i*ArcTan[c*x] - 2*b*d*e*x*ArcTan[c*x] + b*e^2*x^2*ArcTan[c*x] - (2*I)*b*d^2
*ArcTan[(c*d)/e]*ArcTan[c*x] + I*b*d^2*ArcTan[c*x]^2 + (b*d*e*ArcTan[c*x]^2
)/c - (b*d*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^2)/c
 + b*d^2*Pi*Log[1 + E^((-2*I)*ArcTan[c*x])] - 2*b*d^2*ArcTan[c*x]*Log[1 + E
^((2*I)*ArcTan[c*x])] + 2*b*d^2*ArcTan[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c
*d)/e] + ArcTan[c*x]))] + 2*b*d^2*ArcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d
)/e] + ArcTan[c*x]))] + 2*a*d^2*Log[d + e*x] + (b*d*e*Log[1 + c^2*x^2])/c +
 (b*d^2*Pi*Log[1 + c^2*x^2])/2 - 2*b*d^2*ArcTan[(c*d)/e]*Log[Sin[ArcTan[(c*
d)/e] + ArcTan[c*x]]] + I*b*d^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])] - I*b*d^
2*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))])/(2*e^3)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\arctan(cx)+ax^2}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arctan(c*x) + a*x^2)/(e*x + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.08, size = 305, normalized size = 1.29

$$\frac{a\,x^2}{2e}-\frac{adx}{e^2}+\frac{a\,d^2\ln(cex+dc)}{e^3}+\frac{b\arctan(cx)\,x^2}{2e}-\frac{bdx\arctan(cx)}{e^2}+\frac{b\arctan(cx)\,d^2\ln(cex+dc)}{e^3}+\frac{ib\,d^2\ln(cex+dc}{2e^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(e*x+d),x)
```

```
[Out] 1/2*a/e*x^2-a*d*x/e^2+a*d^2/e^3*ln(c*e*x+c*d)+1/2*b*arctan(c*x)*x^2/e-b*d*x
*arctan(c*x)/e^2+b*arctan(c*x)*d^2/e^3*ln(c*e*x+c*d)+1/2*I*b/e^3*d^2*ln(c*e
*x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))-1/2*I*b/e^3*d^2*ln(c*e*x+c*d)*ln((I*e+c*e
*x)/(I*e-d*c))+1/2*I*b/e^3*d^2*dilog((I*e-c*e*x)/(d*c+I*e))-1/2*I*b/e^3*d^2
*dilog((I*e+c*e*x)/(I*e-d*c))+1/2/c*b/e^2*d*ln(c^2*d^2-2*(c*e*x+c*d)*c*d+(c
*e*x+c*d)^2+e^2)+1/2*b*arctan(c*x)/c^2/e-1/2*b*x/c/e-1/2/c*b*d/e^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a\left(\frac{2\,d^2\log(ex+d)}{e^3}+\frac{ex^2-2\,dx}{e^2}\right)+2\,b\int\frac{x^2\arctan(cx)}{2\,(ex+d)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(2*d^2*log(e*x + d)/e^3 + (e*x^2 - 2*d*x)/e^2) + 2*b*integrate(1/2*x^
2*arctan(c*x)/(e*x + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + e*x),x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\left(a+b\operatorname{atan}{\left(cx\right)}\right)}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(e*x+d),x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))/(d + e*x), x)
```

3.136 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex}\,dx$

Optimal. Leaf size=179

$$\frac{d\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^2}-\frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e^2}+\frac{ax}{e}-\frac{b\log\left(c^2x^2+1\right)}{2ce}-\frac{ibd\text{Li}_2\left(1-\frac{2}{1-icx}\right)}{2e^2}+\cdots$$

```
[Out] a*x/e+b*x*arctan(c*x)/e+d*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/e^2-d*(a+b*arct
an(c*x))*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^2-1/2*b*ln(c^2*x^2+1)/c/e-1/
2*I*b*d*polylog(2,1-2/(1-I*c*x))/e^2+1/2*I*b*d*polylog(2,1-2*c*(e*x+d)/(c*d
+I*e)/(1-I*c*x))/e^2
```

Rubi [A] time = 0.16, antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.412, Rules used = {4876, 4846, 260, 4856, 2402, 2315, 2447}

$$-\frac{ibd\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e^2}+\frac{ibd\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{2e^2}+\frac{d\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^2}-\frac{d\left(a+b\tan^{-1}(cx)\right)\cdots}{e\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + e*x),x]
```

```
[Out] (a*x)/e + (b*x*ArcTan[c*x])/e + (d*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/
e^2 - (d*(a + b*ArcTan[c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))]
)/e^2 - (b*Log[1 + c^2*x^2])/(2*c*e) - ((I/2)*b*d*PolyLog[2, 1 - 2/(1 - I*c
*x)])/e^2 + ((I/2)*b*d*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c
*x))])/e^2
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{e} - \frac{d\left(a+b\tan^{-1}(cx)\right)}{e(d+ex)}\right)dx$$

$$= \frac{\int \left(a+b\tan^{-1}(cx)\right)dx}{e} - \frac{d\int \frac{a+b\tan^{-1}(cx)}{d+ex}\,dx}{e}$$

$$= \frac{ax}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e^2} - \frac{(bc\ldots}{\ldots}$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2\ldots}{(cd\ldots}\right)}{e^2}$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2\ldots}{(cd\ldots}\right)}{e^2}$$

Mathematica [A] time = 1.59, size = 329, normalized size = 1.84

$$\frac{-2ad\log(d+ex)+2aex+\frac{b\left(e\sqrt{\frac{c^2d^2}{e^2}+1}\,\tan^{-1}(cx)^2e^{i\tan^{-1}\left(\frac{cd}{e}\right)}-\frac{1}{2}\pi cd\log\left(c^2x^2+1\right)-e\log\left(c^2x^2+1\right)+icd\,\mathrm{Li}_2\left(e^{2i\left(\tan^{-1}\left(\frac{cd}{e}\right)+\tan^{-1}(cx)\right)}\right)+2icd\ldots}{\ldots}}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + e*x),x]
```

```
[Out] (2*a*e*x - 2*a*d*Log[d + e*x] + (b*((-I)*c*d*Pi*ArcTan[c*x] + 2*c*e*x*ArcTa
n[c*x] + (2*I)*c*d*ArcTan[(c*d)/e]*ArcTan[c*x] - I*c*d*ArcTan[c*x]^2 - e*Ar
cTan[c*x]^2 + Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^2
 - c*d*Pi*Log[1 + E^((-2*I)*ArcTan[c*x])] + 2*c*d*ArcTan[c*x]*Log[1 + E^((2
*I)*ArcTan[c*x])] - 2*c*d*ArcTan[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e]
 + ArcTan[c*x]))] - 2*c*d*ArcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + A
rcTan[c*x]))] - e*Log[1 + c^2*x^2] - (c*d*Pi*Log[1 + c^2*x^2])/2 + 2*c*d*Ar
cTan[(c*d)/e]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]] - I*c*d*PolyLog[2, -E
^((2*I)*ArcTan[c*x])] + I*c*d*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan
[c*x]))]))/c)/(2*e^2)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx\arctan(cx)+ax}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*x*arctan(c*x) + a*x)/(e*x + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 235, normalized size = 1.31

$$\frac{ax}{e}-\frac{ad\ln(cex+dc)}{e^2}+\frac{bx\arctan(cx)}{e}-\frac{b\arctan(cx)d\ln(cex+dc)}{e^2}-\frac{b\ln\left(c^2d^2-2(cex+dc)cd+(cex+dc)^2+e^2\right)}{2ce}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(e*x+d),x)
```

```
[Out] a*x/e-a*d/e^2*ln(c*e*x+c*d)+b*x*arctan(c*x)/e-b*arctan(c*x)*d/e^2*ln(c*e*x+
c*d)-1/2/c*b/e*ln(c^2*d^2-2*(c*e*x+c*d)*c*d+(c*e*x+c*d)^2+e^2)-1/2*I*b/e^2*
d*ln(c*e*x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))+1/2*I*b/e^2*d*ln(c*e*x+c*d)*ln((I
*e+c*e*x)/(I*e-d*c))-1/2*I*b/e^2*d*dilog((I*e-c*e*x)/(d*c+I*e))+1/2*I*b/e^2
*d*dilog((I*e+c*e*x)/(I*e-d*c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{x}{e}-\frac{d\log(ex+d)}{e^2}\right)+2b\int\frac{x\arctan(cx)}{2(ex+d)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x+d),x, algorithm="maxima")
```

```
[Out] a*(x/e - d*log(e*x + d)/e^2) + 2*b*integrate(1/2*x*arctan(c*x)/(e*x + d), x
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x\,(a+b\,\mathrm{atan}(c\,x))}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + e*x),x)
```

```
[Out] int((x*(a + b*atan(c*x)))/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x(a+b\,\mathrm{atan}(cx))}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(e*x+d),x)
```

```
[Out] Integral(x*(a + b*atan(c*x))/(d + e*x), x)
```

3.137 $\int \frac{a+b\tan^{-1}(cx)}{d+ex}\,dx$

Optimal. Leaf size=138

$$\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e}-\frac{\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e}-\frac{ib\text{Li}_2\left(1-\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{2e}+\frac{ib\text{Li}_2\left(1-\frac{2}{1-icx}\right)}{2e}$$

```
[Out] -(a+b*arctan(c*x))*ln(2/(1-I*c*x))/e+(a+b*arctan(c*x))*ln(2*c*(e*x+d)/(c*d+
I*e)/(1-I*c*x))/e+1/2*I*b*polylog(2,1-2/(1-I*c*x))/e-1/2*I*b*polylog(2,1-2*
c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e
```

Rubi [A] time = 0.07, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4856, 2402, 2315, 2447}

$$-\frac{ib\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{2e}+\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e}-\frac{\log\left(\frac{2}{1-icx}\right)\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + e*x),x]
```

```
[Out] -(((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e) + ((a + b*ArcTan[c*x])*Log[(2
*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e + ((I/2)*b*PolyLog[2, 1 - 2/(1
- I*c*x)])/e - ((I/2)*b*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*
c*x))])/e
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{d+ex}\,dx = -\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e} + \frac{(bc)\int \frac{\log\left(\frac{2}{1-icx}\right)}{1+c^2x^2}\,dx}{e}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e} - \frac{ib\text{Li}_2\left(1-\frac{2c(d+e}{(cd+ie)(1}\right.}{2e}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e} + \frac{ib\text{Li}_2\left(1-\frac{2}{1-icx}\right)}{2e}$$

Mathematica [A] time = 0.06, size = 138, normalized size = 1.00

$$\frac{2a\log(d+ex)+ib\text{Li}_2\left(\frac{e(1-icx)}{icd+e}\right)-ib\text{Li}_2\left(-\frac{e(cx-i)}{cd+ie}\right)+ib\log(1-icx)\log\left(\frac{c(d+ex)}{cd-ie}\right)-ib\log(1+icx)\log\left(\frac{c(d+ex)}{cd+ie}\right)}{2e}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + e*x),x]
```

```
[Out] (2*a*Log[d + e*x] + I*b*Log[1 - I*c*x]*Log[(c*(d + e*x))/(c*d - I*e)] - I*b
*Log[1 + I*c*x]*Log[(c*(d + e*x))/(c*d + I*e)] + I*b*PolyLog[2, (e*(1 - I*c
*x))/(I*c*d + e)] - I*b*PolyLog[2, -((e*(-I + c*x))/(c*d + I*e))])/(2*e)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e*x + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 168, normalized size = 1.22

$$\frac{a\ln(cex+dc)}{e}+\frac{b\ln(cex+dc)\arctan(cx)}{e}+\frac{ib\ln(cex+dc)\ln\left(\frac{-cex+ie}{dc+ie}\right)}{2e}-\frac{ib\ln(cex+dc)\ln\left(\frac{cex+ie}{-dc+ie}\right)}{2e}+\frac{ib\,\text{dilog}\left(\frac{-ce}{dc}\right.}{2e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(e*x+d),x)
```

```
[Out] a*ln(c*e*x+c*d)/e+b*ln(c*e*x+c*d)/e*arctan(c*x)+1/2*I*b*ln(c*e*x+c*d)/e*ln(
(I*e-c*e*x)/(d*c+I*e))-1/2*I*b*ln(c*e*x+c*d)/e*ln((I*e+c*e*x)/(I*e-d*c))+1/
2*I*b/e*dilog((I*e-c*e*x)/(d*c+I*e))-1/2*I*b/e*dilog((I*e+c*e*x)/(I*e-d*c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2b\int \frac{\arctan(cx)}{2(ex+d)}\,dx+\frac{a\log(ex+d)}{e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x+d),x, algorithm="maxima")
```

```
[Out] 2*b*integrate(1/2*arctan(c*x)/(e*x + d), x) + a*log(e*x + d)/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + e*x),x)
```

```
[Out] int((a + b*atan(c*x))/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\,\mathrm{atan}\,(cx)}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(e*x+d),x)
```

```
[Out] Integral((a + b*atan(c*x))/(d + e*x), x)
```

3.138 $\int \frac{a+b\tan^{-1}(cx)}{x(d+ex)}\,dx$

Optimal. Leaf size=181

$$-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{d}+\frac{\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}+\frac{a\log(x)}{d}+\frac{ib\text{Li}_2\left(1-\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{2d}+\frac{ib\text{Li}_2(-ic$$

```
[Out] a*ln(x)/d+(a+b*arctan(c*x))*ln(2/(1-I*c*x))/d-(a+b*arctan(c*x))*ln(2*c*(e*x
+d)/(c*d+I*e)/(1-I*c*x))/d+1/2*I*b*polylog(2,-I*c*x)/d-1/2*I*b*polylog(2,I*
c*x)/d-1/2*I*b*polylog(2,1-2/(1-I*c*x))/d+1/2*I*b*polylog(2,1-2*c*(e*x+d)/(
c*d+I*e)/(1-I*c*x))/d
```

Rubi [A] time = 0.19, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {4876, 4848, 2391, 4856, 2402, 2315, 2447}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{2d}+\frac{ib\text{PolyLog}(2,-icx)}{2d}-\frac{ib\text{PolyLog}(2,icx)}{2d}-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2d}-\frac{\left(a+b\tan^{-1}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + e*x)),x]
```

```
[Out] (a*Log[x])/d + ((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/d - ((a + b*ArcTan[
c*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/d + ((I/2)*b*PolyLog[
2, (-I)*c*x])/d - ((I/2)*b*PolyLog[2, I*c*x])/d - ((I/2)*b*PolyLog[2, 1 - 2
/(1 - I*c*x)])/d + ((I/2)*b*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1
- I*c*x))])/d
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x(d+ex)}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{dx} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d(d+ex)}\right)dx$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{d+ex}\,dx}{d}$$

$$= \frac{a\log(x)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{d} + \frac{(ib)}{}$$

$$= \frac{a\log(x)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{d} + \frac{ib\mathrm{Li}_2}{}$$

$$= \frac{a\log(x)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{d} + \frac{ib\mathrm{Li}_2}{}$$

Mathematica [A] time = 0.10, size = 169, normalized size = 0.93

$$\frac{-2a\log(d+ex)+2a\log(x)-ib\mathrm{Li}_2\left(\frac{e(1-icx)}{icd+e}\right)+ib\mathrm{Li}_2\left(-\frac{e(cx-i)}{cd+ie}\right)-ib\log(1-icx)\log\left(\frac{c(d+ex)}{cd-ie}\right)+ib\log(1+icx)\,\mathrm{l}}{2d}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x)),x]
```

```
[Out] (2*a*Log[x] - 2*a*Log[d + e*x] - I*b*Log[1 - I*c*x]*Log[(c*(d + e*x))/(c*d
- I*e)] + I*b*Log[1 + I*c*x]*Log[(c*(d + e*x))/(c*d + I*e)] + I*b*PolyLog[2
, (-I)*c*x] - I*b*PolyLog[2, I*c*x] - I*b*PolyLog[2, (e*(1 - I*c*x))/(I*c*d
 + e)] + I*b*PolyLog[2, -((e*(-I + c*x))/(c*d + I*e))])/(2*d)
```

fricas [F] time = 1.69, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\arctan(cx)+a}{ex^2+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e*x^2 + d*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 260, normalized size = 1.44

$$\frac{a\ln(cx)}{d}-\frac{a\ln(cex+dc)}{d}+\frac{b\arctan(cx)\ln(cx)}{d}-\frac{b\arctan(cx)\ln(cex+dc)}{d}+\frac{ib\ln(cx)\ln(icx+1)}{2d}-\frac{ib\ln(cx)\ln(-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(e*x+d),x)
```

```
[Out] a/d*ln(c*x)-a/d*ln(c*e*x+c*d)+b*arctan(c*x)/d*ln(c*x)-b*arctan(c*x)/d*ln(c*
e*x+c*d)+1/2*I*b/d*ln(c*x)*ln(1+I*c*x)-1/2*I*b/d*ln(c*x)*ln(1-I*c*x)+1/2*I*
b/d*dilog(1+I*c*x)-1/2*I*b/d*dilog(1-I*c*x)-1/2*I*b/d*ln(c*e*x+c*d)*ln((I*e
-c*e*x)/(d*c+I*e))+1/2*I*b/d*ln(c*e*x+c*d)*ln((I*e+c*e*x)/(I*e-d*c))-1/2*I*
b/d*dilog((I*e-c*e*x)/(d*c+I*e))+1/2*I*b/d*dilog((I*e+c*e*x)/(I*e-d*c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{\log(ex+d)}{d}-\frac{\log(x)}{d}\right)+2\,b\int\frac{\arctan(cx)}{2\left(ex^2+dx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x+d),x, algorithm="maxima")
```

```
[Out] -a*(log(e*x + d)/d - log(x)/d) + 2*b*integrate(1/2*arctan(c*x)/(e*x^2 + d*x
), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x\,\left(d+e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + e*x)),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{atan}\,(cx)}{x\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(e*x+d),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x*(d + e*x)), x)
```

3.139 $\int \frac{a+b\tan^{-1}(cx)}{x^2(d+ex)}\,dx$

Optimal. Leaf size=232

$$-\frac{e\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{d^2}-\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ae\log(x)}{d^2}-\frac{bc\log\left(c^2x\right.}{2d}$$

```
[Out] (-a-b*arctan(c*x))/d/x+b*c*ln(x)/d-a*e*ln(x)/d^2-e*(a+b*arctan(c*x))*ln(2/(
1-I*c*x))/d^2+e*(a+b*arctan(c*x))*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d^2-1
/2*b*c*ln(c^2*x^2+1)/d-1/2*I*b*e*polylog(2,-I*c*x)/d^2+1/2*I*b*e*polylog(2,
I*c*x)/d^2+1/2*I*b*e*polylog(2,1-2/(1-I*c*x))/d^2-1/2*I*b*e*polylog(2,1-2*c
*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d^2
```

Rubi [A] time = 0.24, antiderivative size = 232, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.632, Rules used = {4876, 4852, 266, 36, 29, 31, 4848, 2391, 4856, 2402, 2315, 2447}

$$-\frac{ibe\text{PolyLog}(2,-icx)}{2d^2}+\frac{ibe\text{PolyLog}(2,icx)}{2d^2}+\frac{ibe\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{2d^2}-\frac{e\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + e*x)),x]
```

```
[Out] -((a + b*ArcTan[c*x])/(d*x)) + (b*c*Log[x])/d - (a*e*Log[x])/d^2 - (e*(a +
b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/d^2 + (e*(a + b*ArcTan[c*x])*Log[(2*c*(d
 + e*x))/((c*d + I*e)*(1 - I*c*x))])/d^2 - (b*c*Log[1 + c^2*x^2])/(2*d) - (
(I/2)*b*e*PolyLog[2, (-I)*c*x])/d^2 + ((I/2)*b*e*PolyLog[2, I*c*x])/d^2 + (
(I/2)*b*e*PolyLog[2, 1 - 2/(1 - I*c*x)])/d^2 - ((I/2)*b*e*PolyLog[2, 1 - (2
*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/d^2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2(d+ex)}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{dx^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x} + \frac{e^2\left(a+b\tan^{-1}(cx)\right)}{d^2(d+ex)}\right)dx$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^2} + \frac{e^2\int \frac{a+b\tan^{-1}(cx)}{d+ex}\,dx}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{ae\log(x)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)\mathrm{lo}}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{ae\log(x)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)\mathrm{lo}}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{ae\log(x)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)\mathrm{lo}}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} + \frac{bc\log(x)}{d} - \frac{ae\log(x)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^2} + \frac{e\left(a+b\right.}{}$$

Mathematica [A] time = 0.15, size = 223, normalized size = 0.96

$$-\frac{-2aex\log(d+ex) + 2ad + 2aex\log(x) + bcdx\log\left(c^2x^2+1\right) - ibex\text{Li}_2\left(\frac{e(1-icx)}{icd+e}\right) + ibex\text{Li}_2\left(-\frac{e(cx-i)}{cd+ie}\right) - ibex\,\mathrm{lo}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + e*x)),x]
```

```
[Out] -1/2*(2*a*d + 2*b*d*ArcTan[c*x] - 2*b*c*d*x*Log[x] + 2*a*e*x*Log[x] - 2*a*e
*x*Log[d + e*x] - I*b*e*x*Log[1 - I*c*x]*Log[(c*(d + e*x))/(c*d - I*e)] + I
*b*e*x*Log[1 + I*c*x]*Log[(c*(d + e*x))/(c*d + I*e)] + b*c*d*x*Log[1 + c^2*
x^2] + I*b*e*x*PolyLog[2, (-I)*c*x] - I*b*e*x*PolyLog[2, I*c*x] - I*b*e*x*P
olyLog[2, (e*(1 - I*c*x))/(I*c*d + e)] + I*b*e*x*PolyLog[2, -((e*(-I + c*x)
)/(c*d + I*e))]])/(d^2*x)
```

fricas [F] time = 0.81, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{ex^3+dx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e*x^3 + d*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 321, normalized size = 1.38

$$-\frac{a}{dx} - \frac{ae\ln(cx)}{d^2} + \frac{ae\ln(cex+dc)}{d^2} - \frac{b\arctan(cx)}{dx} - \frac{b\arctan(cx)e\ln(cx)}{d^2} + \frac{b\arctan(cx)e\ln(cex+dc)}{d^2} + \frac{ibe\,\mathrm{dilo}}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(e*x+d),x)
```

```
[Out] -a/d/x-a/d^2*e*ln(c*x)+a/d^2*e*ln(c*e*x+c*d)-b*arctan(c*x)/d/x-b*arctan(c*x
)/d^2*e*ln(c*x)+b*arctan(c*x)/d^2*e*ln(c*e*x+c*d)+1/2*I*b/d^2*e*dilog(1-I*c
*x)+1/2*I*b/d^2*e*ln(c*x)*ln(1-I*c*x)+1/2*I*b/d^2*e*dilog((I*e-c*e*x)/(d*c+
I*e))-1/2*I*b/d^2*e*dilog((I*e+c*e*x)/(I*e-d*c))+c*b/d*ln(c*x)-1/2*b*c*ln(c
^2*x^2+1)/d-1/2*I*b/d^2*e*dilog(1+I*c*x)-1/2*I*b/d^2*e*ln(c*x)*ln(1+I*c*x)-
1/2*I*b/d^2*e*ln(c*e*x+c*d)*ln((I*e+c*e*x)/(I*e-d*c))+1/2*I*b/d^2*e*ln(c*e*
x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{e\log\left(ex+d\right)}{d^2}-\frac{e\log(x)}{d^2}-\frac{1}{dx}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(ex^3+dx^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a*(e*log(e*x + d)/d^2 - e*log(x)/d^2 - 1/(d*x)) + 2*b*integrate(1/2*arctan(
c*x)/(e*x^3 + d*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^2\,\left(d+e\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + e*x)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + e*x)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(e*x+d),x)
```

```
[Out] Timed out
```

3.140 $\int \frac{a+b\tan^{-1}(cx)}{x^3(d+ex)}\,dx$

Optimal. Leaf size=293

$$\frac{e^2\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{d^3}+\frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x}-\frac{a+b\tan^{-1}(cx)}{2dx^2}+$$

```
[Out] -1/2*b*c/d/x-1/2*b*c^2*arctan(c*x)/d+1/2*(-a-b*arctan(c*x))/d/x^2+e*(a+b*ar
ctan(c*x))/d^2/x-b*c*e*ln(x)/d^2+a*e^2*ln(x)/d^3+e^2*(a+b*arctan(c*x))*ln(2
/(1-I*c*x))/d^3-e^2*(a+b*arctan(c*x))*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d
^3+1/2*b*c*e*ln(c^2*x^2+1)/d^2+1/2*I*b*e^2*polylog(2,-I*c*x)/d^3-1/2*I*b*e^
2*polylog(2,I*c*x)/d^3-1/2*I*b*e^2*polylog(2,1-2/(1-I*c*x))/d^3+1/2*I*b*e^2
*polylog(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d^3
```

Rubi [A] time = 0.28, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 14, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.737$, Rules used = {4876, 4852, 325, 203, 266, 36, 29, 31, 4848, 2391, 4856, 2402, 2315, 2447}

$$\frac{ibe^2\text{PolyLog}(2,-icx)}{2d^3}-\frac{ibe^2\text{PolyLog}(2,icx)}{2d^3}-\frac{ibe^2\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2d^3}+\frac{ibe^2\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{2d^3}+\frac{e^2}{}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + e*x)),x]
```

```
[Out] -(b*c)/(2*d*x) - (b*c^2*ArcTan[c*x])/(2*d) - (a + b*ArcTan[c*x])/(2*d*x^2)
+ (e*(a + b*ArcTan[c*x]))/(d^2*x) - (b*c*e*Log[x])/d^2 + (a*e^2*Log[x])/d^3
 + (e^2*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/d^3 - (e^2*(a + b*ArcTan[c*
x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/d^3 + (b*c*e*Log[1 + c^
2*x^2])/(2*d^2) + ((I/2)*b*e^2*PolyLog[2, (-I)*c*x])/d^3 - ((I/2)*b*e^2*Pol
yLog[2, I*c*x])/d^3 - ((I/2)*b*e^2*PolyLog[2, 1 - 2/(1 - I*c*x)])/d^3 + ((I
/2)*b*e^2*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/d^3
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3(d+ex)}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{dx^3} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x^2} + \frac{e^2\left(a+b\tan^{-1}(cx)\right)}{d^3x} - \frac{e^3\left(a+b\tan^{-1}(cx)\right)}{d^3(d+ex)}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d^2} + \frac{e^2\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^3} - \frac{e^3\int \frac{a+b\tan^{-1}(cx)}{d+ex}\,dx}{d^3}$$

$$= -\frac{a+b\tan^{-1}(cx)}{2dx^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x} + \frac{ae^2\log(x)}{d^3} + \frac{e^2\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^3}$$

$$= -\frac{bc}{2dx} - \frac{a+b\tan^{-1}(cx)}{2dx^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x} + \frac{ae^2\log(x)}{d^3} + \frac{e^2\left(a+b\tan^{-1}(cx)\right)\log}{d^3}$$

$$= -\frac{bc}{2dx} - \frac{bc^2\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{2dx^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x} + \frac{ae^2\log(x)}{d^3} + \frac{e^2\left(a+\right.}{}$$

$$= -\frac{bc}{2dx} - \frac{bc^2\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{2dx^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{bce\log(x)}{d^2} + \frac{ae^2\log}{d^3}$$

Mathematica [C] time = 0.19, size = 298, normalized size = 1.02

$$\frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{a+b\tan^{-1}(cx)}{2dx^2} + \frac{ae^2\log(x)}{d^3} - \frac{ae^2\log(d+ex)}{d^3} - \frac{bce\left(2\log(x)-\log\left(c^2x^2+1\right)\right)}{2d^2} - \frac{bc\,{}_2F_1\left(-\frac{1}{2}\right.}{2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x)),x]
```

```
[Out] -1/2*(a + b*ArcTan[c*x])/(d*x^2) + (e*(a + b*ArcTan[c*x]))/(d^2*x) - (b*c*H
ypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/(2*d*x) + (a*e^2*Log[x])/d^3 -
(a*e^2*Log[d + e*x])/d^3 - (b*c*e*(2*Log[x] - Log[1 + c^2*x^2]))/(2*d^2) +
((I/2)*b*e^2*PolyLog[2, (-I)*c*x])/d^3 - ((I/2)*b*e^2*PolyLog[2, I*c*x])/d^
3 - ((I/2)*b*(e^2*Log[1 - I*c*x]*Log[(c*(d + e*x))/(c*d - I*e)] + e^2*PolyL
og[2, (e*(1 - I*c*x))/(I*c*d + e)]))/d^3 + ((I/2)*b*(e^2*Log[1 + I*c*x]*Log
[(c*(d + e*x))/(c*d + I*e)] + e^2*PolyLog[2, -((e*(1 + I*c*x))/(I*c*d - e))
]))/d^3
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{ex^4+dx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e*x^4 + d*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.08, size = 393, normalized size = 1.34

$$-\frac{a}{2d\,x^2}+\frac{a\,e^2\ln(cx)}{d^3}+\frac{ae}{d^2x}-\frac{a\,e^2\ln(cex+dc)}{d^3}-\frac{b\arctan(cx)}{2d\,x^2}+\frac{b\arctan(cx)\,e^2\ln(cx)}{d^3}+\frac{b\arctan(cx)\,e}{d^2x}-\frac{b\arctan(cx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(e*x+d),x)
```

```
[Out] -1/2*a/d/x^2+a/d^3*e^2*ln(c*x)+a/d^2*e/x-a/d^3*e^2*ln(c*e*x+c*d)-1/2*b*arct
an(c*x)/d/x^2+b*arctan(c*x)/d^3*e^2*ln(c*x)+b*arctan(c*x)/d^2*e/x-b*arctan(
c*x)/d^3*e^2*ln(c*e*x+c*d)-c*b/d^2*e*ln(c*x)-1/2*b*c/d/x+1/2*b*c*e*ln(c^2*x
^2+1)/d^2-1/2*b*c^2*arctan(c*x)/d-1/2*I*b/d^3*e^2*dilog((I*e-c*e*x)/(d*c+I*
e))-1/2*I*b/d^3*e^2*dilog(1-I*c*x)+1/2*I*b/d^3*e^2*ln(c*e*x+c*d)*ln((I*e+c*
e*x)/(I*e-d*c))-1/2*I*b/d^3*e^2*ln(c*x)*ln(1-I*c*x)+1/2*I*b/d^3*e^2*dilog(1
+I*c*x)+1/2*I*b/d^3*e^2*ln(c*x)*ln(1+I*c*x)-1/2*I*b/d^3*e^2*ln(c*e*x+c*d)*l
n((I*e-c*e*x)/(d*c+I*e))+1/2*I*b/d^3*e^2*dilog((I*e+c*e*x)/(I*e-d*c))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{2\,e^2\log(ex+d)}{d^3}-\frac{2\,e^2\log(x)}{d^3}-\frac{2\,ex-d}{d^2x^2}\right)+2\,b\int\frac{\arctan(cx)}{2\left(ex^4+dx^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(2*e^2*log(e*x + d)/d^3 - 2*e^2*log(x)/d^3 - (2*e*x - d)/(d^2*x^2))
+ 2*b*integrate(1/2*arctan(c*x)/(e*x^4 + d*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}(c\,x)}{x^3\,(d+e\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + e*x)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{atan}(cx)}{x^3\,(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(e*x+d),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x**3*(d + e*x)), x)
```

3.141 $\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx$

Optimal. Leaf size=598

$$-\frac{i\left(a+b\tan^{-1}(cx)\right)^2}{3c^3e}-\frac{2b\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^3e}-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e^2}-\frac{ibd^3\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(\ldots\right.}{e^4}$$

```
[Out] a*b*d*x/c/e^2+1/3*b^2*x/c^2/e-1/3*b^2*arctan(c*x)/c^3/e+b^2*d*x*arctan(c*x)
/c/e^2-1/3*b*x^2*(a+b*arctan(c*x))/c/e-1/3*I*b^2*polylog(2,1-2/(1+I*c*x))/c
^3/e-1/2*d*(a+b*arctan(c*x))^2/c^2/e^2-I*b*d^3*(a+b*arctan(c*x))*polylog(2,
1-2/(1-I*c*x))/e^4+d^2*x*(a+b*arctan(c*x))^2/e^3-1/2*d*x^2*(a+b*arctan(c*x)
)^2/e^2+1/3*x^3*(a+b*arctan(c*x))^2/e+d^3*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x
))/e^4+2*b*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c/e^3-2/3*b*(a+b*arctan(c*
x))*ln(2/(1+I*c*x))/c^3/e-d^3*(a+b*arctan(c*x))^2*ln(2*c*(e*x+d)/(c*d+I*e)/
(1-I*c*x))/e^4-1/2*b^2*d*ln(c^2*x^2+1)/c^2/e^2+I*b^2*d^2*polylog(2,1-2/(1+I
*c*x))/c/e^3+I*d^2*(a+b*arctan(c*x))^2/c/e^3+I*b*d^3*(a+b*arctan(c*x))*poly
log(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^4-1/3*I*(a+b*arctan(c*x))^2/c^3/
e+1/2*b^2*d^3*polylog(3,1-2/(1-I*c*x))/e^4-1/2*b^2*d^3*polylog(3,1-2*c*(e*x
+d)/(c*d+I*e)/(1-I*c*x))/e^4
```

Rubi [A] time = 0.67, antiderivative size = 598, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 260, 4884, 321, 203, 4858}

$$-\frac{ibd^3\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^4}+\frac{ibd^3\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e^4}-\frac{ib^2\text{PolyL}\ldots}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x])^2)/(d + e*x),x]
```

```
[Out] (a*b*d*x)/(c*e^2) + (b^2*x)/(3*c^2*e) - (b^2*ArcTan[c*x])/(3*c^3*e) + (b^2*
d*x*ArcTan[c*x])/(c*e^2) - (b*x^2*(a + b*ArcTan[c*x]))/(3*c*e) + (I*d^2*(a
+ b*ArcTan[c*x])^2)/(c*e^3) - (d*(a + b*ArcTan[c*x])^2)/(2*c^2*e^2) - ((I/3
)*(a + b*ArcTan[c*x])^2)/(c^3*e) + (d^2*x*(a + b*ArcTan[c*x])^2)/e^3 - (d*x
^2*(a + b*ArcTan[c*x])^2)/(2*e^2) + (x^3*(a + b*ArcTan[c*x])^2)/(3*e) + (d^
3*(a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e^4 + (2*b*d^2*(a + b*ArcTan[c*
x])*Log[2/(1 + I*c*x)])/(c*e^3) - (2*b*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x
)])/(3*c^3*e) - (d^3*(a + b*ArcTan[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)
*(1 - I*c*x))])/e^4 - (b^2*d*Log[1 + c^2*x^2])/(2*c^2*e^2) - (I*b*d^3*(a +
b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e^4 + (I*b^2*d^2*PolyLog[2, 1
 - 2/(1 + I*c*x)])/(c*e^3) - ((I/3)*b^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c^3
*e) + (I*b*d^3*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I
*e)*(1 - I*c*x))])/e^4 + (b^2*d^3*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e^4) -
(b^2*d^3*PolyLog[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e^4)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx = \int\left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{e^3}-\frac{dx\left(a+b\tan^{-1}(cx)\right)^2}{e^2}+\frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{e}-\frac{d^3\left(\right.}{}\right.$$

$$=\frac{d^2\int\left(a+b\tan^{-1}(cx)\right)^2\,dx}{e^3}-\frac{d^3\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx}{e^3}-\frac{d\int x\left(a+b\tan^{-1}(cx)\right)^2\,d}{e^2}$$

$$=\frac{d^2x\left(a+b\tan^{-1}(cx)\right)^2}{e^3}-\frac{dx^2\left(a+b\tan^{-1}(cx)\right)^2}{2e^2}+\frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{3e}+\frac{d^3\left(a\right.}{}$$

$$=\frac{id^2\left(a+b\tan^{-1}(cx)\right)^2}{ce^3}+\frac{d^2x\left(a+b\tan^{-1}(cx)\right)^2}{e^3}-\frac{dx^2\left(a+b\tan^{-1}(cx)\right)^2}{2e^2}+\frac{x^3\left(\right.}{}$$

$$=\frac{abdx}{ce^2}-\frac{bx^2\left(a+b\tan^{-1}(cx)\right)}{3ce}+\frac{id^2\left(a+b\tan^{-1}(cx)\right)^2}{ce^3}-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e^2}-$$

$$=\frac{abdx}{ce^2}+\frac{b^2x}{3c^2e}+\frac{b^2dx\tan^{-1}(cx)}{ce^2}-\frac{bx^2\left(a+b\tan^{-1}(cx)\right)}{3ce}+\frac{id^2\left(a+b\tan^{-1}(cx)\right)^2}{ce^3}$$

$$=\frac{abdx}{ce^2}+\frac{b^2x}{3c^2e}-\frac{b^2\tan^{-1}(cx)}{3c^3e}+\frac{b^2dx\tan^{-1}(cx)}{ce^2}-\frac{bx^2\left(a+b\tan^{-1}(cx)\right)}{3ce}+\frac{id^2\left(a\right.}{}$$

$$=\frac{abdx}{ce^2}+\frac{b^2x}{3c^2e}-\frac{b^2\tan^{-1}(cx)}{3c^3e}+\frac{b^2dx\tan^{-1}(cx)}{ce^2}-\frac{bx^2\left(a+b\tan^{-1}(cx)\right)}{3ce}+\frac{id^2\left(a\right.}{}$$

Mathematica [B] time = 22.33, size = 1413, normalized size = 2.36

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x])^2)/(d + e*x),x]
```

```
[Out] -1/6*(2*a*b*e^3 - 6*a^2*c^3*d^2*e*x - 6*a*b*c^2*d*e^2*x - 2*b^2*c*e^3*x + 3
*a^2*c^3*d*e^2*x^2 + 2*a*b*c^2*e^3*x^2 - 2*a^2*c^3*e^3*x^3 + 6*a*b*c*d*e^2*
ArcTan[c*x] + 2*b^2*e^3*ArcTan[c*x] + (6*I)*a*b*c^3*d^3*Pi*ArcTan[c*x] - 12
*a*b*c^3*d^2*e*x*ArcTan[c*x] - 6*b^2*c^2*d*e^2*x*ArcTan[c*x] + 6*a*b*c^3*d*
```

```
e^2*x^2*ArcTan[c*x] + 2*b^2*c^2*e^3*x^2*ArcTan[c*x] - 4*a*b*c^3*e^3*x^3*Arc
Tan[c*x] - (12*I)*a*b*c^3*d^3*ArcTan[(c*d)/e]*ArcTan[c*x] + (6*I)*a*b*c^3*d
^3*ArcTan[c*x]^2 + 6*a*b*c^2*d^2*e*ArcTan[c*x]^2 + (6*I)*b^2*c^2*d^2*e*ArcT
an[c*x]^2 + 3*b^2*c*d*e^2*ArcTan[c*x]^2 - (2*I)*b^2*e^3*ArcTan[c*x]^2 - 6*a
*b*c^2*d^2*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^2 -
6*b^2*c^3*d^2*e*x*ArcTan[c*x]^2 + 3*b^2*c^3*d*e^2*x^2*ArcTan[c*x]^2 - 2*b^2
*c^3*e^3*x^3*ArcTan[c*x]^2 + (4*I)*b^2*c^3*d^3*ArcTan[c*x]^3 + 4*b^2*c^2*d^
2*e*ArcTan[c*x]^3 - 4*b^2*c^2*d^2*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*
d)/e])*ArcTan[c*x]^3 + 6*a*b*c^3*d^3*Pi*Log[1 + E^((-2*I)*ArcTan[c*x])] + 6
*b^2*c^3*d^3*Pi*ArcTan[c*x]*Log[1 + E^((-2*I)*ArcTan[c*x])] - 12*a*b*c^3*d^
3*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - 12*b^2*c^2*d^2*e*ArcTan[c*x]
*Log[1 + E^((2*I)*ArcTan[c*x])] + 4*b^2*e^3*ArcTan[c*x]*Log[1 + E^((2*I)*Ar
cTan[c*x])] - 6*b^2*c^3*d^3*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] +
12*a*b*c^3*d^3*ArcTan[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c
*x]))] + 12*a*b*c^3*d^3*ArcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + Arc
Tan[c*x]))] + 12*b^2*c^3*d^3*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[1 - E^((2*I)*(
ArcTan[(c*d)/e] + ArcTan[c*x]))] + 12*b^2*c^3*d^3*ArcTan[c*x]^2*Log[1 - E^(
(2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - 6*b^2*c^3*d^3*Pi*ArcTan[c*x]*Log[
(-2*I)/(-I + c*x)] + 6*a^2*c^3*d^3*Log[d + e*x] + 6*a*b*c^2*d^2*e*Log[1 + c
^2*x^2] + 3*b^2*c*d*e^2*Log[1 + c^2*x^2] - 2*a*b*e^3*Log[1 + c^2*x^2] + 3*a
*b*c^3*d^3*Pi*Log[1 + c^2*x^2] + 12*b^2*c^3*d^3*ArcTan[(c*d)/e]*ArcTan[c*x]
*Log[(I + c*x + E^((2*I)*ArcTan[(c*d)/e])*(-I + c*x))/(2*E^(I*ArcTan[(c*d)/
e])*Sqrt[1 + c^2*x^2])] - 12*b^2*c^3*d^3*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[1
- E^((2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e]
)*Sin[2*ArcTan[c*x]]] - 6*b^2*c^3*d^3*ArcTan[c*x]^2*Log[1 - E^((2*I)*ArcTan
[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[2*ArcTan[c*
x]]] - 12*a*b*c^3*d^3*ArcTan[(c*d)/e]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]
]] - 12*b^2*c^3*d^3*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[Sin[ArcTan[(c*d)/e] + A
rcTan[c*x]]] + (2*I)*b*(3*a*c^3*d^3 + 3*b*c^2*d^2*e - b*e^3 + 3*b*c^3*d^3*A
rcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])] - (6*I)*b*c^3*d^3*(a + b*Arc
Tan[c*x])*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - 3*b^2*c^3
*d^3*PolyLog[3, -E^((2*I)*ArcTan[c*x])] + 3*b^2*c^3*d^3*PolyLog[3, E^((2*I)
*(ArcTan[(c*d)/e] + ArcTan[c*x]))])/(c^3*e^4)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^3\arctan(cx)^2 + 2\,abx^3\arctan(cx) + a^2x^3}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*arctan(c*x)^2 + 2*a*b*x^3*arctan(c*x) + a^2*x^3)/(e*x + d
), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 50.03, size = 2136, normalized size = 3.57

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))^2/(e*x+d),x)
```

```
[Out] -1/2*I*b^2/e^4*d^3*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(-I*(1+I*c
*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c))*csgn(I*(-I*(1+I*c
*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*
x^2+1)+1))*arctan(c*x)^2-I*b^2*d^3/e^4*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(
c^2*x^2+1))-2*I/c*b^2/e^3*d^2*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-I/c^2*
b^2*d*arctan(c*x)/e^2-2*I/c*b^2/e^3*d^2*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/
2))-I/c*b^2/e^3*d^2*arctan(c*x)^2+I*a*b/e^4*d^3*dilog((I*e+c*e*x)/(I*e-d*c)
)-a*b*arctan(c*x)/e^2*d*x^2+2*a*b*arctan(c*x)*x*d^2/e^3-2*a*b*arctan(c*x)*d
^3/e^4*ln(c*e*x+c*d)+2/c*b^2/e^3*d^2*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+
1)^(1/2))+2/c*b^2/e^3*d^2*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-1
/c*a*b/e^3*ln(c^2*d^2-2*(c*e*x+c*d)*c*d+(c*e*x+c*d)^2+e^2)*d^2-1/c^2*a*b/e^
2*arctan(c*x)*d-1/2*c*b^2*d^4/e^4/(d*c-I*e)*polylog(3,(I*e-d*c)/(d*c+I*e)*(
1+I*c*x)^2/(c^2*x^2+1))+b^2*d^3/e^3/(d*c-I*e)*arctan(c*x)*polylog(2,(I*e-d*
c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))+1/2*I*b^2*d^3/e^3/(d*c-I*e)*polylog(3
,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))-I*a*b/e^4*d^3*dilog((I*e-c*e*
x)/(d*c+I*e))+a^2/e^3*x*d^2-a^2*d^3/e^4*ln(c*e*x+c*d)+1/2*b^2*d^3/e^4*polyl
og(3,-(1+I*c*x)^2/(c^2*x^2+1))+1/3*b^2*arctan(c*x)^2/e*x^3-1/2*a^2/e^2*x^2*
d+I*c*b^2*d^4/e^4/(d*c-I*e)*arctan(c*x)*polylog(2,(I*e-d*c)/(d*c+I*e)*(1+I*
c*x)^2/(c^2*x^2+1))+1/2*I*b^2/e^4*d^3*Pi*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)
*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)
*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arct
an(c*x)^2+1/2*I*b^2/e^4*d^3*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(
-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x
)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+4/3/c*a*b*d^2/e^3+1/3*I/c^3*b^2/e-1/3/c
*a*b*x^2/e+1/c^2*b^2/e^2*d*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-2/3/c^3*b^2/e*arct
an(c*x)*ln(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))-2/3/c^3*b^2/e*arctan(c*x)*ln(1-
I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/3/c^3*a*b/e*ln(c^2*d^2-2*(c*e*x+c*d)*c*d+(
c*e*x+c*d)^2+e^2)-1/2/c^2*b^2/e^2*d*arctan(c*x)^2-1/3/c*b^2*arctan(c*x)/e*x
^2+b^2*d^3/e^4*arctan(c*x)^2*ln(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^
2/(c^2*x^2+1)+I*e+d*c)-b^2*arctan(c*x)^2*d^3/e^4*ln(c*e*x+c*d)-1/2*b^2*arct
an(c*x)^2/e^2*x^2*d+b^2*arctan(c*x)^2/e^3*x*d^2+2/3*a*b*arctan(c*x)/e*x^3+2
/3*I/c^3*b^2/e*dilog(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/3*I/c^3*b^2/e*arcta
n(c*x)^2+2/3*I/c^3*b^2/e*dilog(1+I*(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/3*a^2/e*x
^3+I*b^2*d^3/e^3/(d*c-I*e)*arctan(c*x)^2*ln(1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)
^2/(c^2*x^2+1))+I*a*b/e^4*d^3*ln(c*e*x+c*d)*ln((I*e+c*e*x)/(I*e-d*c))-c*b^2
*d^4/e^4/(d*c-I*e)*arctan(c*x)^2*ln(1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*
x^2+1))-1/2*I*b^2/e^4*d^3*Pi*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*
c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-I*
a*b/e^4*d^3*ln(c*e*x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))+a*b*d*x/c/e^2+b^2*d*x*a
rctan(c*x)/c/e^2+1/3*b^2*x/c^2/e-1/3*b^2*arctan(c*x)/c^3/e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{6}a^2\left(\frac{6d^3\log(ex+d)}{e^4}-\frac{2e^2x^3-3dex^2+6d^2x}{e^3}\right)+\frac{2e^3\int\frac{36\left(b^2c^2e^3x^5+b^2e^3x^3\right)\arctan(cx)^2+3\left(b^2c^2e^3x^5+b^2e^3x^3\right)\log\left(c^2x^2+1\right)}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] -1/6*a^2*(6*d^3*log(e*x + d)/e^4 - (2*e^2*x^3 - 3*d*e*x^2 + 6*d^2*x)/e^3) +
 1/96*(96*e^3*integrate(1/48*(36*(b^2*c^2*e^3*x^5 + b^2*e^3*x^3)*arctan(c*x
)^2 + 3*(b^2*c^2*e^3*x^5 + b^2*e^3*x^3)*log(c^2*x^2 + 1)^2 + 4*(24*a*b*c^2*
e^3*x^5 - 2*b^2*c*e^3*x^4 - 3*b^2*c*d^2*e*x^2 - 6*b^2*c*d^3*x + (b^2*c*d*e^
2 + 24*a*b*e^3)*x^3)*arctan(c*x) + 2*(2*b^2*c^2*e^3*x^5 - b^2*c^2*d*e^2*x^4
 + 3*b^2*c^2*d^2*e*x^3 + 6*b^2*c^2*d^3*x^2)*log(c^2*x^2 + 1))/(c^2*e^4*x^3
+ c^2*d*e^3*x^2 + e^4*x + d*e^3), x) + 4*(2*b^2*e^2*x^3 - 3*b^2*d*e*x^2 + 6
*b^2*d^2*x)*arctan(c*x)^2 - (2*b^2*e^2*x^3 - 3*b^2*d*e*x^2 + 6*b^2*d^2*x)*l
og(c^2*x^2 + 1)^2)/e^3
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,(a+b\,\mathrm{atan}\,(c\,x))^2}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x))^2)/(d + e*x),x)
```

```
[Out] int((x^3*(a + b*atan(c*x))^2)/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\,(a+b\,\mathrm{atan}\,(cx))^2}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))**2/(e*x+d),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))**2/(d + e*x), x)
```

3.142 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx$

Optimal. Leaf size=430

$$\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e}+\frac{ibd^2\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^3}-\frac{ibd^2\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e^3}-\frac{d^2\log}{}$$

```
[Out] -a*b*x/c/e-b^2*x*arctan(c*x)/c/e-I*d*(a+b*arctan(c*x))^2/c/e^2+1/2*(a+b*arc
tan(c*x))^2/c^2/e-d*x*(a+b*arctan(c*x))^2/e^2+1/2*x^2*(a+b*arctan(c*x))^2/e
-d^2*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/e^3-2*b*d*(a+b*arctan(c*x))*ln(2/(
1+I*c*x))/c/e^2+d^2*(a+b*arctan(c*x))^2*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))
/e^3+1/2*b^2*ln(c^2*x^2+1)/c^2/e+I*b*d^2*(a+b*arctan(c*x))*polylog(2,1-2/(1
-I*c*x))/e^3-I*b^2*d*polylog(2,1-2/(1+I*c*x))/c/e^2-I*b*d^2*(a+b*arctan(c*x
))*polylog(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^3-1/2*b^2*d^2*polylog(3,1
-2/(1-I*c*x))/e^3+1/2*b^2*d^2*polylog(3,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/
e^3
```

Rubi [A] time = 0.42, antiderivative size = 430, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 260, 4884, 4858}

$$\frac{ibd^2\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^3}-\frac{ibd^2\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e^3}-\frac{b^2d^2\text{PolyL}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x])^2)/(d + e*x),x]
```

```
[Out] -((a*b*x)/(c*e)) - (b^2*x*ArcTan[c*x])/(c*e) - (I*d*(a + b*ArcTan[c*x])^2)/
(c*e^2) + (a + b*ArcTan[c*x])^2/(2*c^2*e) - (d*x*(a + b*ArcTan[c*x])^2)/e^2
 + (x^2*(a + b*ArcTan[c*x])^2)/(2*e) - (d^2*(a + b*ArcTan[c*x])^2*Log[2/(1
- I*c*x)])/e^3 - (2*b*d*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c*e^2) + (
d^2*(a + b*ArcTan[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e
^3 + (b^2*Log[1 + c^2*x^2])/(2*c^2*e) + (I*b*d^2*(a + b*ArcTan[c*x])*PolyLo
g[2, 1 - 2/(1 - I*c*x)])/e^3 - (I*b^2*d*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c*e
^2) - (I*b*d^2*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I
*e)*(1 - I*c*x))])/e^3 - (b^2*d^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e^3) +
(b^2*d^2*PolyLog[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e^3)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx = \int \left(-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{e^2} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{e^2(d+ex)}\right) dx$$

$$= -\frac{d\int \left(a+b\tan^{-1}(cx)\right)^2 dx}{e^2} + \frac{d^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}dx}{e^2} + \frac{\int x\left(a+b\tan^{-1}(cx)\right)^2 dx}{e}$$

$$= -\frac{dx\left(a+b\tan^{-1}(cx)\right)^2}{e^2} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2e} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-ic\right.}$$

$$= -\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{ce^2} - \frac{dx\left(a+b\tan^{-1}(cx)\right)^2}{e^2} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2e} - \frac{d^2\left(a\right.}{}$$

$$= -\frac{abx}{ce} - \frac{id\left(a+b\tan^{-1}(cx)\right)^2}{ce^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e} - \frac{dx\left(a+b\tan^{-1}(cx)\right)^2}{e^2} + \frac{x^2}{}$$

$$= -\frac{abx}{ce} - \frac{b^2x\tan^{-1}(cx)}{ce} - \frac{id\left(a+b\tan^{-1}(cx)\right)^2}{ce^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e} - \frac{dx\left(a+b\right.}{}$$

$$= -\frac{abx}{ce} - \frac{b^2x\tan^{-1}(cx)}{ce} - \frac{id\left(a+b\tan^{-1}(cx)\right)^2}{ce^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e} - \frac{dx\left(a+b\right.}{}$$

Mathematica [B] time = 17.98, size = 1035, normalized size = 2.41

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x])^2)/(d + e*x),x]
```

```
[Out] -1/6*(6*a^2*c^2*d*e*x - 3*a^2*c^2*e^2*x^2 - 6*a^2*c^2*d^2*Log[d + e*x] + 6*
a*b*(c*e^2*x - I*c^2*d^2*Pi*ArcTan[c*x] + 2*c^2*d*e*x*ArcTan[c*x] - e^2*(1
+ c^2*x^2)*ArcTan[c*x] + (2*I)*c^2*d^2*ArcTan[(c*d)/e]*ArcTan[c*x] - I*c^2*
d^2*ArcTan[c*x]^2 - c*d*e*ArcTan[c*x]^2 + c*d*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(
I*ArcTan[(c*d)/e])*ArcTan[c*x]^2 - c^2*d^2*Pi*Log[1 + E^((-2*I)*ArcTan[c*x]
)] + 2*c^2*d^2*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - 2*c^2*d^2*ArcTa
n[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - 2*c^2*d^2*A
rcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - c*d*e*Log[1
 + c^2*x^2] - (c^2*d^2*Pi*Log[1 + c^2*x^2])/2 + 2*c^2*d^2*ArcTan[(c*d)/e]*L
og[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]] - I*c^2*d^2*PolyLog[2, -E^((2*I)*Arc
Tan[c*x])] + I*c^2*d^2*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))
]) + b^2*(6*c*e^2*x*ArcTan[c*x] - (6*I)*c*d*e*ArcTan[c*x]^2 + 6*c^2*d*e*x*A
rcTan[c*x]^2 - 3*e^2*(1 + c^2*x^2)*ArcTan[c*x]^2 - (2*I)*c^2*d^2*ArcTan[c*x
]^3 - 2*c*d*e*ArcTan[c*x]^3 + 12*c*d*e*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[
c*x])] + 6*c^2*d^2*ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] - 3*e^2*Log
[1 + c^2*x^2] - (6*I)*c*d*(e + c*d*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan
[c*x])] + 3*c^2*d^2*PolyLog[3, -E^((2*I)*ArcTan[c*x])] + c*d*(2*ArcTan[c*x]
*(((-I)*c*d - e + 2*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e]))*ArcTan
[c*x]^2 - 3*c*d*ArcTan[c*x]*(2*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c
*x]))] - Log[1 - E^((2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*
ArcTan[(c*d)/e])*Sin[2*ArcTan[c*x]]]) + 3*c*d*(Pi*(-Log[1 + E^((-2*I)*ArcTa
n[c*x])] + Log[(-2*I)/(-I + c*x)]) - 2*ArcTan[(c*d)/e]*(Log[1 - E^((2*I)*(A
rcTan[(c*d)/e] + ArcTan[c*x]))] + Log[(I + c*x + E^((2*I)*ArcTan[(c*d)/e])*
(-I + c*x))/(2*E^(I*ArcTan[(c*d)/e])*Sqrt[1 + c^2*x^2])] - Log[1 - E^((2*I)
*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[2*Ar
cTan[c*x]]] - Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]]))) + (6*I)*c*d*ArcTan
[c*x]*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - 3*c*d*PolyLog
[3, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))])))/(c^2*e^3)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^2\arctan\left(cx\right)^2+2\,abx^2\arctan\left(cx\right)+a^2x^2}{ex+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*arctan(c*x)^2 + 2*a*b*x^2*arctan(c*x) + a^2*x^2)/(e*x + d
), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 40.44, size = 1784, normalized size = 4.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))^2/(e*x+d),x)
```

```
[Out] I*b^2*d^2/e^3*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-b^2*d^2/e^2/(
d*c-I*e)*arctan(c*x)*polylog(2,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))
+2*a*b*arctan(c*x)*d^2/e^3*ln(c*e*x+c*d)-2*a*b*arctan(c*x)*d/e^2*x+1/2*c*b^
2*d^3/e^3/(d*c-I*e)*polylog(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))+
I/c*b^2/e^2*d*arctan(c*x)^2-2/c*b^2/e^2*d*arctan(c*x)*ln(1+I*(1+I*c*x)/(c^2
*x^2+1)^(1/2))-2/c*b^2/e^2*d*arctan(c*x)*ln(1-I*(1+I*c*x)/(c^2*x^2+1)^(1/2)
)+1/c*a*b/e^2*d*ln(c^2*d^2-2*(c*e*x+c*d)*c*d+(c*e*x+c*d)^2+e^2)-1/2*I*b^2*d
^2/e^2/(d*c-I*e)*polylog(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))-I*a
*b/e^3*d^2*dilog((I*e+c*e*x)/(I*e-d*c))+2*I/c*b^2/e^2*d*dilog(1+I*(1+I*c*x)
/(c^2*x^2+1)^(1/2))-a*b*x/c/e-b^2*x*arctan(c*x)/c/e-1/c^2*b^2/e*ln((1+I*c*x
)^2/(c^2*x^2+1)+1)+1/2/c^2*b^2*arctan(c*x)^2/e+1/2*b^2*arctan(c*x)^2*x^2/e-
1/2*b^2*d^2/e^3*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+a^2*d^2/e^3*ln(c*e*x+c*
d)+c*b^2*d^3/e^3/(d*c-I*e)*arctan(c*x)^2*ln(1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)
^2/(c^2*x^2+1))+I*a*b/e^3*d^2*ln(c*e*x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))-I*b^2
*d^2/e^2/(d*c-I*e)*arctan(c*x)^2*ln(1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*
x^2+1))+1/2*a^2*x^2/e+1/2*I*b^2/e^3*d^2*Pi*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+
1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*ar
ctan(c*x)^2-I*a*b/e^3*d^2*ln(c*e*x+c*d)*ln((I*e+c*e*x)/(I*e-d*c))-I*c*b^2*d
^3/e^3/(d*c-I*e)*arctan(c*x)*polylog(2,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2
*x^2+1))-1/2*I*b^2/e^3*d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(-
I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)
^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*b^2/e^3*d^2*Pi*csgn(I*(-I*(1+I*c*x
)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c))*csgn(I*(-I*(1+I*c*x
)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^
2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2/e^3*d^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+
1)+1))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e
+d*c))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e
+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+2*I/c*b^2/e^2*d*dilog(1-I*
(1+I*c*x)/(c^2*x^2+1)^(1/2))+I*a*b/e^3*d^2*dilog((I*e-c*e*x)/(d*c+I*e))+a*b
*arctan(c*x)*x^2/e-b^2*arctan(c*x)^2*d/e^2*x+1/c^2*a*b/e*arctan(c*x)+I/c^2*
b^2*arctan(c*x)/e-1/c*a*b*d/e^2+b^2*arctan(c*x)^2*d^2/e^3*ln(c*e*x+c*d)-b^2
```

```
*d^2/e^3*arctan(c*x)^2*ln(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2
*x^2+1)+I*e+d*c)-a^2*d/e^2*x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^{2}\left(\frac{2\,d^{2}\log\left(ex+d\right)}{e^{3}}+\frac{ex^{2}-2\,dx}{e^{2}}\right)+\frac{4\left(b^{2}ex^{2}-2\,b^{2}dx\right)\arctan\left(cx\right)^{2}+2\,e^{2}\int\frac{12\left(b^{2}c^{2}e^{2}x^{4}+b^{2}e^{2}x^{2}\right)\arctan(cx)^{2}+\left(b^{2}c^{2}e^{2}\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(2*d^2*log(e*x + d)/e^3 + (e*x^2 - 2*d*x)/e^2) + 1/32*(4*(b^2*e*x^2
 - 2*b^2*d*x)*arctan(c*x)^2 + 32*e^2*integrate(1/16*(12*(b^2*c^2*e^2*x^4 +
b^2*e^2*x^2)*arctan(c*x)^2 + (b^2*c^2*e^2*x^4 + b^2*e^2*x^2)*log(c^2*x^2 +
1)^2 + 4*(8*a*b*c^2*e^2*x^4 - b^2*c*e^2*x^3 + 2*b^2*c*d^2*x + (b^2*c*d*e +
8*a*b*e^2)*x^2)*arctan(c*x) + 2*(b^2*c^2*e^2*x^4 - b^2*c^2*d*e*x^3 - 2*b^2*
c^2*d^2*x^2)*log(c^2*x^2 + 1))/(c^2*e^3*x^3 + c^2*d*e^2*x^2 + e^3*x + d*e^2
), x) - (b^2*e*x^2 - 2*b^2*d*x)*log(c^2*x^2 + 1)^2)/e^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{d+e\,x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x))^2)/(d + e*x),x)
```

```
[Out] int((x^2*(a + b*atan(c*x))^2)/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\left(a+b\operatorname{atan}{\left(cx\right)}\right)^{2}}{d+ex}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))**2/(e*x+d),x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))**2/(d + e*x), x)
```

3.143 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx$

Optimal. Leaf size=323

$$-\frac{ibd\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^2}+\frac{ibd\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e^2}+\frac{d\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)^2}{e^2}$$

```
[Out] I*(a+b*arctan(c*x))^2/c/e+x*(a+b*arctan(c*x))^2/e+d*(a+b*arctan(c*x))^2*ln(
2/(1-I*c*x))/e^2+2*b*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c/e-d*(a+b*arctan(c*
x))^2*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^2-I*b*d*(a+b*arctan(c*x))*polyl
og(2,1-2/(1-I*c*x))/e^2+I*b^2*polylog(2,1-2/(1+I*c*x))/c/e+I*b*d*(a+b*arcta
n(c*x))*polylog(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e^2+1/2*b^2*d*polylog(
3,1-2/(1-I*c*x))/e^2-1/2*b^2*d*polylog(3,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))
/e^2
```

Rubi [A] time = 0.27, antiderivative size = 323, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {4876, 4846, 4920, 4854, 2402, 2315, 4858}

$$-\frac{ibd\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^2}+\frac{ibd\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e^2}+\frac{b^2d\text{PolyLog}\left(\right.}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x])^2)/(d + e*x),x]
```

```
[Out] (I*(a + b*ArcTan[c*x])^2)/(c*e) + (x*(a + b*ArcTan[c*x])^2)/e + (d*(a + b*A
rcTan[c*x])^2*Log[2/(1 - I*c*x)])/e^2 + (2*b*(a + b*ArcTan[c*x])*Log[2/(1 +
 I*c*x)])/(c*e) - (d*(a + b*ArcTan[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)
*(1 - I*c*x))])/e^2 - (I*b*d*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*
x)])/e^2 + (I*b^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/(c*e) + (I*b*d*(a + b*ArcT
an[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e^2 + (
b^2*d*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e^2) - (b^2*d*PolyLog[3, 1 - (2*c*(
d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e^2)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{e} - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{e(d+ex)}\right)dx$$

$$= \frac{\int \left(a+b\tan^{-1}(cx)\right)^2\,dx}{e} - \frac{d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx}{e}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{d\left(a+b\tan^{-1}(cx)\right)^2\log}{e^2}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} - $$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} + $$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} + $$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{d\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} + $$

Mathematica [B] time = 15.93, size = 940, normalized size = 2.91

$$-\frac{-4b^2\sqrt{\frac{c^2d^2}{e^2}+1}\,ee^{i\tan^{-1}\left(\frac{cd}{e}\right)}\tan^{-1}(cx)^3 + 4ib^2cd\tan^{-1}(cx)^3 + 4b^2e\tan^{-1}(cx)^3 - 6ab\sqrt{\frac{c^2d^2}{e^2}+1}\,ee^{i\tan^{-1}\left(\frac{cd}{e}\right)}\tan^{-1}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x])^2)/(d + e*x),x]
```

```
[Out] -1/6*(-6*a^2*c*e*x + (6*I)*a*b*c*d*Pi*ArcTan[c*x] - 12*a*b*c*e*x*ArcTan[c*x
] - (12*I)*a*b*c*d*ArcTan[(c*d)/e]*ArcTan[c*x] + (6*I)*a*b*c*d*ArcTan[c*x]^
2 + 6*a*b*e*ArcTan[c*x]^2 + (6*I)*b^2*e*ArcTan[c*x]^2 - 6*a*b*Sqrt[1 + (c^2
*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^2 - 6*b^2*c*e*x*ArcTan[c*x]^
2 + (4*I)*b^2*c*d*ArcTan[c*x]^3 + 4*b^2*e*ArcTan[c*x]^3 - 4*b^2*Sqrt[1 + (c
^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^3 + 6*a*b*c*d*Pi*Log[1 + E
^((-2*I)*ArcTan[c*x])] + 6*b^2*c*d*Pi*ArcTan[c*x]*Log[1 + E^((-2*I)*ArcTan[
c*x])] - 12*a*b*c*d*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - 12*b^2*e*A
rcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - 6*b^2*c*d*ArcTan[c*x]^2*Log[1 +
 E^((2*I)*ArcTan[c*x])] + 12*a*b*c*d*ArcTan[(c*d)/e]*Log[1 - E^((2*I)*(ArcT
an[(c*d)/e] + ArcTan[c*x]))] + 12*a*b*c*d*ArcTan[c*x]*Log[1 - E^((2*I)*(Arc
Tan[(c*d)/e] + ArcTan[c*x]))] + 12*b^2*c*d*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[
1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 12*b^2*c*d*ArcTan[c*x]^2*L
og[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - 6*b^2*c*d*Pi*ArcTan[c*x
]*Log[(-2*I)/(-I + c*x)] + 6*a^2*c*d*Log[d + e*x] + 6*a*b*e*Log[1 + c^2*x^2
] + 3*a*b*c*d*Pi*Log[1 + c^2*x^2] + 12*b^2*c*d*ArcTan[(c*d)/e]*ArcTan[c*x]*
Log[(I + c*x + E^((2*I)*ArcTan[(c*d)/e])*(-I + c*x))/(2*E^(I*ArcTan[(c*d)/e
])*Sqrt[1 + c^2*x^2])] - 12*b^2*c*d*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[1 - E^(
(2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin
[2*ArcTan[c*x]]] - 6*b^2*c*d*ArcTan[c*x]^2*Log[1 - E^((2*I)*ArcTan[(c*d)/e]
)*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[2*ArcTan[c*x]]] - 12
*a*b*c*d*ArcTan[(c*d)/e]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]] - 12*b^2*c
*d*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]] + (6
*I)*b*(a*c*d + b*e + b*c*d*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*x])]
- (6*I)*b*c*d*(a + b*ArcTan[c*x])*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + Ar
cTan[c*x]))] - 3*b^2*c*d*PolyLog[3, -E^((2*I)*ArcTan[c*x])] + 3*b^2*c*d*Pol
yLog[3, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))])/(c*e^2)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x\arctan(cx)^2 + 2\,abx\arctan(cx) + a^2x}{ex+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x*arctan(c*x)^2 + 2*a*b*x*arctan(c*x) + a^2*x)/(e*x + d), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 15.75, size = 16024, normalized size = 49.61

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))^2/(e*x+d),x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\frac{x}{e} - \frac{d\log(ex+d)}{e^2}\right) + \frac{4\,b^2x\arctan(cx)^2 - b^2x\log\left(c^2x^2+1\right)^2 + e\int \frac{12\left(b^2c^2ex^3+b^2ex\right)\arctan(cx)^2+\left(b^2c^2ex^3+b^2ex\right)\log(}{}}{16\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a^2*(x/e - d*log(e*x + d)/e^2) + 1/16*(4*b^2*x*arctan(c*x)^2 - b^2*x*log(c^
2*x^2 + 1)^2 + 16*e*integrate(1/16*(12*(b^2*c^2*e*x^3 + b^2*e*x)*arctan(c*x
)^2 + (b^2*c^2*e*x^3 + b^2*e*x)*log(c^2*x^2 + 1)^2 + 8*(4*a*b*c^2*e*x^3 - b
^2*c*e*x^2 - (b^2*c*d - 4*a*b*e)*x)*arctan(c*x) + 4*(b^2*c^2*e*x^3 + b^2*c^
2*d*x^2)*log(c^2*x^2 + 1))/(c^2*e^2*x^3 + c^2*d*e*x^2 + e^2*x + d*e), x))/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(c\,x))^2}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x))^2)/(d + e*x),x)
```

```
[Out] int((x*(a + b*atan(c*x))^2)/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(cx))^2}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))**2/(e*x+d),x)
```

```
[Out] Integral(x*(a + b*atan(c*x))**2/(d + e*x), x)
```

3.144 $\int \frac{(a+b\tan^{-1}(cx))^2}{d+ex}\,dx$

Optimal. Leaf size=223

$$-\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e}+\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e}+\frac{ib\mathrm{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(c\right.}{e}$$

```
[Out] -(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/e+(a+b*arctan(c*x))^2*ln(2*c*(e*x+d)/(
c*d+I*e)/(1-I*c*x))/e+I*b*(a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/e-I*b*
(a+b*arctan(c*x))*polylog(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/e-1/2*b^2*po
lylog(3,1-2/(1-I*c*x))/e+1/2*b^2*polylog(3,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x
))/e
```

Rubi [A] time = 0.05, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.056, Rules used = {4858}

$$-\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{e}+\frac{ib\mathrm{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e}+\frac{b^2\mathrm{PolyLog}\left(3,1\right.}{2e}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(d + e*x),x]
```

```
[Out] -(((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e) + ((a + b*ArcTan[c*x])^2*Lo
g[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e + (I*b*(a + b*ArcTan[c*x])*
PolyLog[2, 1 - 2/(1 - I*c*x)])/e - (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 -
(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e - (b^2*PolyLog[3, 1 - 2/(1 -
I*c*x)])/(2*e) + (b^2*PolyLog[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*
x))])/(2*e)
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx=-\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e}+\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{e}+\frac{ib\left(a+b\tan\right.}{}$$

Mathematica [B] time = 14.97, size = 741, normalized size = 3.32

$$6a^2cd\log(d+ex)+12abcd\left(\tan^{-1}(cx)\left(\frac{1}{2}\log\left(c^2x^2+1\right)+\log\left(\sin\left(\tan^{-1}\left(\frac{cd}{e}\right)+\tan^{-1}(cx)\right)\right)\right)+\frac{1}{2}\left(-\log\left(\frac{2}{\sqrt{c^2x^2+}}\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(d + e*x),x]
```

```
[Out] (6*a^2*c*d*Log[d + e*x] + 12*a*b*c*d*(ArcTan[c*x]*(Log[1 + c^2*x^2]/2 + Log
[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]]) + ((-1/4*I)*(Pi - 2*ArcTan[c*x])^2 -
I*(ArcTan[(c*d)/e] + ArcTan[c*x])^2 + (Pi - 2*ArcTan[c*x])*Log[1 + E^((-2*I
)*ArcTan[c*x])] + 2*(ArcTan[(c*d)/e] + ArcTan[c*x])*Log[1 - E^((2*I)*(ArcTa
n[(c*d)/e] + ArcTan[c*x]))] - (Pi - 2*ArcTan[c*x])*Log[2/Sqrt[1 + c^2*x^2]]
 - 2*(ArcTan[(c*d)/e] + ArcTan[c*x])*Log[2*Sin[ArcTan[(c*d)/e] + ArcTan[c*x
]]] - I*PolyLog[2, -E^((-2*I)*ArcTan[c*x])] - I*PolyLog[2, E^((2*I)*(ArcTan
[(c*d)/e] + ArcTan[c*x]))])/2) + b^2*(2*ArcTan[c*x]^2*((I*c*d + e)*ArcTan[c
*x] - 3*c*d*Log[1 + E^((2*I)*ArcTan[c*x])]) - 2*ArcTan[c*x]*(((-I)*c*d - e
+ 2*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e]))*ArcTan[c*x]^2 - 3*c*d*
ArcTan[c*x]*(2*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - Log[1 -
 E^((2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])
*Sin[2*ArcTan[c*x]]]) + 3*c*d*(Pi*(-Log[1 + E^((-2*I)*ArcTan[c*x])] + Log[(
-2*I)/(-I + c*x)]) - 2*ArcTan[(c*d)/e]*(Log[1 - E^((2*I)*(ArcTan[(c*d)/e] +
 ArcTan[c*x]))] + Log[(I + c*x + E^((2*I)*ArcTan[(c*d)/e])*(-I + c*x))/(2*E
^(I*ArcTan[(c*d)/e])*Sqrt[1 + c^2*x^2])] - Log[1 - E^((2*I)*ArcTan[(c*d)/e]
)*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[2*ArcTan[c*x]]] - Lo
g[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]]))) + (6*I)*c*d*ArcTan[c*x]*PolyLog[2,
 -E^((2*I)*ArcTan[c*x])] - (6*I)*c*d*ArcTan[c*x]*PolyLog[2, E^((2*I)*(ArcTa
n[(c*d)/e] + ArcTan[c*x]))] - 3*c*d*PolyLog[3, -E^((2*I)*ArcTan[c*x])] + 3*
c*d*PolyLog[3, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))]))/(6*c*d*e)
```

fricas [F] time = 0.93, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \arctan(cx)^2 + 2\,ab\arctan(cx) + a^2}{ex + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x + d), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.24, size = 1297, normalized size = 5.82

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/(e*x+d),x)
```

```
[Out] a^2*ln(c*e*x+c*d)/e+b^2*ln(c*e*x+c*d)/e*arctan(c*x)^2-b^2/e*arctan(c*x)^2*l
n(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)+1/2*I*b
^2/e*Pi*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*
e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+1/2*I*b^2/e*Pi*csgn(I*(
-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x
)^2/(c^2*x^2+1)+1))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c
^2*x^2+1)+I*e+d*c))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-I*a*b
```

```
*ln(c*e*x+c*d)/e*ln((I*e+c*e*x)/(I*e-d*c))+I*b^2/e*arctan(c*x)*polylog(2,-(
1+I*c*x)^2/(c^2*x^2+1))+I*a*b/e*dilog((I*e-c*e*x)/(d*c+I*e))-1/2*b^2/e*poly
log(3,-(1+I*c*x)^2/(c^2*x^2+1))+c*b^2/e*d/(d*c-I*e)*arctan(c*x)^2*ln(1-(I*e
-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))-1/2*I*b^2/e*Pi*csgn(I*(-I*(1+I*c*x
)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^
2+1)+1))^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+1/2*c*b^2/e*d/
(d*c-I*e)*polylog(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))+b^2*arctan
(c*x)^2*ln(1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/(e+I*d*c)-I*b^2*a
rctan(c*x)*polylog(2,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/(e+I*d*c)
+1/2*b^2*polylog(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/(e+I*d*c)+2
*a*b*ln(c*e*x+c*d)/e*arctan(c*x)-1/2*I*b^2/e*Pi*csgn(I*(-I*(1+I*c*x)^2/(c^2
*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))
^2*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c
))*arctan(c*x)^2-I*a*b/e*dilog((I*e+c*e*x)/(I*e-d*c))+I*a*b*ln(c*e*x+c*d)/e
*ln((I*e-c*e*x)/(d*c+I*e))-I*c*b^2/e*d/(d*c-I*e)*arctan(c*x)*polylog(2,(I*e
-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^2\log(ex+d)}{e}+\int\frac{12\,b^2\arctan(cx)^2+b^2\log\left(c^2x^2+1\right)^2+32\,ab\arctan(cx)}{16\,(ex+d)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a^2*log(e*x + d)/e + integrate(1/16*(12*b^2*arctan(c*x)^2 + b^2*log(c^2*x^2
 + 1)^2 + 32*a*b*arctan(c*x))/(e*x + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{(a+b\,\mathrm{atan}(c\,x))^2}{d+e\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(d + e*x),x)
```

```
[Out] int((a + b*atan(c*x))^2/(d + e*x), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(a+b\,\mathrm{atan}(cx))^2}{d+ex}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/(e*x+d),x)
```

```
[Out] Integral((a + b*atan(c*x))**2/(d + e*x), x)
```

3.145 $\int \frac{(a+b\tan^{-1}(cx))^2}{x(d+ex)}\,dx$

Optimal. Leaf size=369

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c(d+ex)}{(cd+ie)(1-icx)}\right)}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{d}-\frac{ib\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(\right.}{d}$$

```
[Out] -2*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d+(a+b*arctan(c*x))^2*ln(2/(
1-I*c*x))/d-(a+b*arctan(c*x))^2*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d-I*b*(
a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/d-I*b*(a+b*arctan(c*x))*polylog(2
,1-2/(1+I*c*x))/d+I*b*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d+I*b*(a+
b*arctan(c*x))*polylog(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d+1/2*b^2*polyl
og(3,1-2/(1-I*c*x))/d-1/2*b^2*polylog(3,1-2/(1+I*c*x))/d+1/2*b^2*polylog(3,
-1+2/(1+I*c*x))/d-1/2*b^2*polylog(3,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d
```

Rubi [A] time = 0.43, antiderivative size = 369, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4876, 4850, 4988, 4884, 4994, 6610, 4858}

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c(d+ex)}{(1-icx)(cd+ie)}\right)}{d}-\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}-\frac{ib\text{PolyLog}\left(2,1\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x*(d + e*x)),x]
```

```
[Out] (2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d + ((a + b*ArcTan[c*x
])^2*Log[2/(1 - I*c*x)])/d - ((a + b*ArcTan[c*x])^2*Log[(2*c*(d + e*x))/((c
*d + I*e)*(1 - I*c*x))])/d - (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 -
 I*c*x)])/d - (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/d + (
I*b*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d + (I*b*(a + b*Arc
Tan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/d + (b
^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*d) - (b^2*PolyLog[3, 1 - 2/(1 + I*c*x)
])/(2*d) + (b^2*PolyLog[3, -1 + 2/(1 + I*c*x)])/(2*d) - (b^2*PolyLog[3, 1 -
 (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*d)
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
```

```
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x(d+ex)}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d(d+ex)}\right)dx$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx}{d} - \frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx}{d}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\tan^{-}\right.}{}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\tan^{-}\right.}{}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\tan^{-}\right.}{}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\tan^{-}\right.}{}$$

Mathematica [B] time = 14.96, size = 835, normalized size = 2.26

$$24cd\log(x)a^2 - 24cd\log(d+ex)a^2 - 24b\left(-\sqrt{\frac{c^2d^2}{e^2}+1}\,ee^{i\tan^{-1}\left(\frac{cd}{e}\right)}\tan^{-1}(cx)^2 + icd\tan^{-1}(cx)^2 + e\tan^{-1}(cx)^2 -\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x*(d + e*x)),x]
```

```
[Out] (24*a^2*c*d*Log[x] - 24*a^2*c*d*Log[d + e*x] - 24*a*b*(I*c*d*Pi*ArcTan[c*x]
 - (2*I)*c*d*ArcTan[(c*d)/e]*ArcTan[c*x] + I*c*d*ArcTan[c*x]^2 + e*ArcTan[c
*x]^2 - Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^2 + c*d
*Pi*Log[1 + E^((-2*I)*ArcTan[c*x])] - 2*c*d*ArcTan[c*x]*Log[1 - E^((2*I)*Ar
cTan[c*x])] + 2*c*d*ArcTan[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + Arc
Tan[c*x]))] + 2*c*d*ArcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[
c*x]))] + (c*d*Pi*Log[1 + c^2*x^2])/2 - 2*c*d*ArcTan[(c*d)/e]*Log[Sin[ArcTa
n[(c*d)/e] + ArcTan[c*x]]] + I*c*d*PolyLog[2, E^((2*I)*ArcTan[c*x])] - I*c*
d*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))]) + b^2*((-I)*c*d*Pi
^3 - 16*e*ArcTan[c*x]^3 + 16*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e]
)*ArcTan[c*x]^3 + 24*c*d*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 24
*c*d*Pi*ArcTan[c*x]*Log[1 + E^((-2*I)*ArcTan[c*x])] - 48*c*d*ArcTan[(c*d)/e
]*ArcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - 48*c*d*A
rcTan[c*x]^2*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 24*c*d*Pi
*ArcTan[c*x]*Log[(-2*I)/(-I + c*x)] - 48*c*d*ArcTan[(c*d)/e]*ArcTan[c*x]*Lo
g[(I + c*x + E^((2*I)*ArcTan[(c*d)/e])*(-I + c*x))/(2*E^(I*ArcTan[(c*d)/e])
*Sqrt[1 + c^2*x^2])] + 48*c*d*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[1 - E^((2*I)*
ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[2*Arc
Tan[c*x]]] + 24*c*d*ArcTan[c*x]^2*Log[1 - E^((2*I)*ArcTan[(c*d)/e])*Cos[2*A
rcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[2*ArcTan[c*x]]] + 48*c*d*ArcT
an[(c*d)/e]*ArcTan[c*x]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]] + (24*I)*c*
d*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + (24*I)*c*d*ArcTan[c*x]*P
olyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 12*c*d*PolyLog[3, E^
((-2*I)*ArcTan[c*x])] - 12*c*d*PolyLog[3, E^((2*I)*(ArcTan[(c*d)/e] + ArcTa
n[c*x]))]))/(24*c*d^2)
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\arctan(cx)^2 + 2\,ab\arctan(cx) + a^2}{ex^2 + dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x^2 + d*x), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.71, size = 2363, normalized size = 6.40

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x/(e*x+d),x)
```

```
[Out] I*b^2*c/(d*c-I*e)*arctan(c*x)*polylog(2,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^
2*x^2+1))+1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^3-1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I*(-I*(1+I*c*
x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x
^2+1)+1))^3+1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)
/((1+I*c*x)^2/(c^2*x^2+1)+1))^3-1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(((1+I*c*x
)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2+I*a*b/d*ln(c*x)*ln(1+I*c*
x)+I*a*b/d*ln(c*e*x+c*d)*ln((I*e+c*e*x)/(I*e-d*c))-I*a*b/d*ln(c*x)*ln(1-I*c
*x)-I*a*b/d*ln(c*e*x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))-b^2*e*arctan(c*x)^2*ln(
1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/d/(e+I*d*c)-b^2*c/(d*c-I*e)*
arctan(c*x)^2*ln(1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))-2*I*b^2/d*a
rctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*b^2/d*arctan(c*x)*po
lylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2*I*b^2/d*Pi*arctan(c*x)^2+1/2*I*b^2
/d*Pi*arctan(c*x)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2
/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1
)+1))-1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn
(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2-1/2*I*b^2/d*P
i*arctan(c*x)^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(-I*(1+I*c*x)^2/
(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c))*csgn(I*(-I*(1+I*c*x)^2/
(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)
+1))-1/2*b^2*e*polylog(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/d/(e+
I*d*c)+1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+
I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2
*x^2+1)+1))+I*b^2*e*arctan(c*x)*polylog(2,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(
c^2*x^2+1))/d/(e+I*d*c)+1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I/((1+I*c*x)^2/(c
^2*x^2+1)+1))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2
+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2+1/2*I*b^2/d*Pi*arctan(c*x)^2*cs
gn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c))*cs
gn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^2-1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I/((1+I*c*x)^
2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+
1)+1))^2-1/2*I*b^2/d*Pi*arctan(c*x)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((
1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c
^2*x^2+1)+1))^2+2*a*b*arctan(c*x)/d*ln(c*x)-2*a*b*arctan(c*x)/d*ln(c*e*x+c*
d)+I*a*b/d*dilog(1+I*c*x)+I*a*b/d*dilog((I*e+c*e*x)/(I*e-d*c))-I*a*b/d*dilo
g(1-I*c*x)-I*a*b/d*dilog((I*e-c*e*x)/(d*c+I*e))-1/2*b^2*c/(d*c-I*e)*polylog
(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))+b^2*arctan(c*x)^2/d*ln(c*x)
-b^2*arctan(c*x)^2/d*ln(c*e*x+c*d)-b^2*arctan(c*x)^2/d*ln((1+I*c*x)^2/(c^2*
x^2+1)-1)+b^2/d*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2/d*arcta
n(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2*arctan(c*x)^2/d*ln(-I*(1+I*c
*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)+2*b^2/d*polylog(3,
-(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*b^2/d*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2)
)-a^2/d*ln(c*e*x+c*d)+a^2/d*ln(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\frac{\log(ex+d)}{d}-\frac{\log(x)}{d}\right)+\int\frac{12\,b^2\arctan(cx)^2+b^2\log\left(c^2x^2+1\right)^2+32\,ab\arctan(cx)}{16\left(ex^2+dx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x+d),x, algorithm="maxima")
```

```
[Out] -a^2*(log(e*x + d)/d - log(x)/d) + integrate(1/16*(12*b^2*arctan(c*x)^2 + b
^2*log(c^2*x^2 + 1)^2 + 32*a*b*arctan(c*x))/(e*x^2 + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2}{x\,\left(d+e\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x*(d + e*x)),x)
[Out] int((a + b*atan(c*x))^2/(x*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(cx\right)\right)^2}{x\left(d+ex\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x/(e*x+d),x)
[Out] Integral((a + b*atan(c*x))**2/(x*(d + e*x)), x)
```

3.146 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+ex)}\,dx$

Optimal. Leaf size=473

$$\frac{ibe\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{ibe\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ibe\text{Li}_2\left(\frac{2}{icx+1}-1\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ibe}{}$$

```
[Out] -I*c*(a+b*arctan(c*x))^2/d-(a+b*arctan(c*x))^2/d/x+2*e*(a+b*arctan(c*x))^2*
arctanh(-1+2/(1+I*c*x))/d^2-e*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/d^2+e*(a+
b*arctan(c*x))^2*ln(2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d^2+2*b*c*(a+b*arctan(
c*x))*ln(2-2/(1-I*c*x))/d+I*b*e*(a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/
d^2-I*b^2*c*polylog(2,-1+2/(1-I*c*x))/d+I*b*e*(a+b*arctan(c*x))*polylog(2,1
-2/(1+I*c*x))/d^2-I*b*e*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d^2-I*b
*e*(a+b*arctan(c*x))*polylog(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d^2-1/2*b
^2*e*polylog(3,1-2/(1-I*c*x))/d^2+1/2*b^2*e*polylog(3,1-2/(1+I*c*x))/d^2-1/
2*b^2*e*polylog(3,-1+2/(1+I*c*x))/d^2+1/2*b^2*e*polylog(3,1-2*c*(e*x+d)/(c*
d+I*e)/(1-I*c*x))/d^2
```

Rubi [A] time = 0.60, antiderivative size = 473, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4876, 4852, 4924, 4868, 2447, 4850, 4988, 4884, 4994, 6610, 4858}

$$\frac{ibe\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{ibe\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ibe\text{PolyLog}\left(2,-1+\frac{2}{1+}\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^2*(d + e*x)),x]
```

```
[Out] ((-I)*c*(a + b*ArcTan[c*x])^2)/d - (a + b*ArcTan[c*x])^2/(d*x) - (2*e*(a +
b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d^2 - (e*(a + b*ArcTan[c*x])^2
*Log[2/(1 - I*c*x)])/d^2 + (e*(a + b*ArcTan[c*x])^2*Log[(2*c*(d + e*x))/((c
*d + I*e)*(1 - I*c*x))])/d^2 + (2*b*c*(a + b*ArcTan[c*x])*Log[2 - 2/(1 - I*
c*x)])/d + (I*b*e*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/d^2 -
(I*b^2*c*PolyLog[2, -1 + 2/(1 - I*c*x)])/d + (I*b*e*(a + b*ArcTan[c*x])*Pol
yLog[2, 1 - 2/(1 + I*c*x)])/d^2 - (I*b*e*(a + b*ArcTan[c*x])*PolyLog[2, -1
+ 2/(1 + I*c*x)])/d^2 - (I*b*e*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d +
 e*x))/((c*d + I*e)*(1 - I*c*x))])/d^2 - (b^2*e*PolyLog[3, 1 - 2/(1 - I*c*x
)])/(2*d^2) + (b^2*e*PolyLog[3, 1 - 2/(1 + I*c*x)])/(2*d^2) - (b^2*e*PolyLo
g[3, -1 + 2/(1 + I*c*x)])/(2*d^2) + (b^2*e*PolyLog[3, 1 - (2*c*(d + e*x))/(
(c*d + I*e)*(1 - I*c*x))])/(2*d^2)
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
```

```
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2(d+ex)}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{e^2\left(a+b\tan^{-1}(cx)\right)^2}{d^2(d+ex)}\right)dx$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx}{d} - \frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx}{d^2} + \frac{e^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}\,dx}{d^2}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{2e\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d^2}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{2e\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{2e\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{2e\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

Mathematica [B] time = 17.85, size = 968, normalized size = 2.05

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^2*(d + e*x)),x]
```

```
[Out] ((-24*a^2*d^2)/x - 24*a^2*d*e*Log[x] + 24*a^2*d*e*Log[d + e*x] + (24*a*b*(I
*c*d*e*Pi*ArcTan[c*x] - (2*c*d^2*ArcTan[c*x])/x - (2*I)*c*d*e*ArcTan[(c*d)/
e]*ArcTan[c*x] + I*c*d*e*ArcTan[c*x]^2 + e^2*ArcTan[c*x]^2 - Sqrt[1 + (c^2*
d^2)/e^2]*e^2*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^2 + c*d*e*Pi*Log[1 + E^((-2
*I)*ArcTan[c*x])] - 2*c*d*e*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + 2*
c*d*e*ArcTan[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] +
2*c*d*e*ArcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 2*
c^2*d^2*Log[(c*x)/Sqrt[1 + c^2*x^2]] + (c*d*e*Pi*Log[1 + c^2*x^2])/2 - 2*c*
d*e*ArcTan[(c*d)/e]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]] + I*c*d*e*PolyL
og[2, E^((2*I)*ArcTan[c*x])] - I*c*d*e*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e]
 + ArcTan[c*x]))]))/c + (I*b^2*(c*d*e*Pi^3 - 24*c^2*d^2*ArcTan[c*x]^2 + ((2
4*I)*c*d^2*ArcTan[c*x]^2)/x - 8*c*d*e*ArcTan[c*x]^3 - (8*I)*e^2*ArcTan[c*x]
^3 + (24*I)*c*d*e*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - (48*I)*c^
2*d^2*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] - 24*c*d*e*ArcTan[c*x]*Pol
yLog[2, E^((-2*I)*ArcTan[c*x])] - 24*c^2*d^2*PolyLog[2, E^((2*I)*ArcTan[c*x
])] + (12*I)*c*d*e*PolyLog[3, E^((-2*I)*ArcTan[c*x])]))/c + (4*b^2*e*(2*Arc
Tan[c*x]*((I*c*d + e - 2*Sqrt[1 + (c^2*d^2)/e^2]*e*E^(I*ArcTan[(c*d)/e]))*A
rcTan[c*x]^2 + 3*c*d*ArcTan[c*x]*(2*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + Arc
Tan[c*x]))] - Log[1 - E^((2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((
2*I)*ArcTan[(c*d)/e])*Sin[2*ArcTan[c*x]]]) + 3*c*d*(Pi*(Log[1 + E^((-2*I)*A
```

```
rcTan[c*x])] - Log[(-2*I)/(-I + c*x)]) + 2*ArcTan[(c*d)/e]*(Log[1 - E^((2*I
)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + Log[(I + c*x + E^((2*I)*ArcTan[(c*d)/
e])*(-I + c*x))/(2*E^(I*ArcTan[(c*d)/e])*Sqrt[1 + c^2*x^2])] - Log[1 - E^((
2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[
2*ArcTan[c*x]]] - Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]])) - (6*I)*c*d*Ar
cTan[c*x]*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 3*c*d*Pol
yLog[3, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))]))/c)/(24*d^3)
```

fricas [F] time = 1.29, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \arctan(cx)^2 + 2\,ab \arctan(cx) + a^2}{ex^3 + dx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x^3 + d*x^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 24.03, size = 40579, normalized size = 85.79

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^2/(e*x+d),x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a^2\left(\frac{e\log(ex+d)}{d^2} - \frac{e\log(x)}{d^2} - \frac{1}{dx}\right) - \frac{4\,b^2 \arctan(cx)^2 - b^2\log\left(c^2x^2+1\right)^2 - dx\int \frac{12\left(b^2c^2dx^2+b^2d\right)\arctan(cx)^2+\left(b^2c^2dx\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x+d),x, algorithm="maxima")
```

```
[Out] a^2*(e*log(e*x + d)/d^2 - e*log(x)/d^2 - 1/(d*x)) - 1/16*(4*b^2*arctan(c*x)
^2 - b^2*log(c^2*x^2 + 1)^2 - 16*d*x*integrate(1/16*(12*(b^2*c^2*d*x^2 + b^
2*d)*arctan(c*x)^2 + (b^2*c^2*d*x^2 + b^2*d)*log(c^2*x^2 + 1)^2 + 8*(b^2*c*
d*x + 4*a*b*d + (4*a*b*c^2*d + b^2*c*e)*x^2)*arctan(c*x) - 4*(b^2*c^2*e*x^3
 + b^2*c^2*d*x^2)*log(c^2*x^2 + 1))/(c^2*d*e*x^5 + c^2*d^2*x^4 + d*e*x^3 +
d^2*x^2), x))/(d*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))^2}{x^2\,(d+e\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^2*(d + e*x)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^2*(d + e*x)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**2/(e*x+d),x)
```

```
[Out] Timed out
```

3.147 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3(d+ex)}\,dx$

Optimal. Leaf size=591

$$-\frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d}-\frac{ibe^2\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}-\frac{ibe^2\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}+\frac{ibe^2\text{Li}_2\left(\right.}{}$$

```
[Out] -b*c*(a+b*arctan(c*x))/d/x-1/2*c^2*(a+b*arctan(c*x))^2/d+I*c*e*(a+b*arctan(
c*x))^2/d^2-1/2*(a+b*arctan(c*x))^2/d/x^2+e*(a+b*arctan(c*x))^2/d^2/x-2*e^2
*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d^3+b^2*c^2*ln(x)/d+e^2*(a+b*a
rctan(c*x))^2*ln(2/(1-I*c*x))/d^3-e^2*(a+b*arctan(c*x))^2*ln(2*c*(e*x+d)/(c
*d+I*e)/(1-I*c*x))/d^3-1/2*b^2*c^2*ln(c^2*x^2+1)/d-2*b*c*e*(a+b*arctan(c*x)
)*ln(2-2/(1-I*c*x))/d^2+I*b*e^2*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))
/d^3+I*b*e^2*(a+b*arctan(c*x))*polylog(2,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))
/d^3-I*b*e^2*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/d^3+I*b^2*c*e*polyl
og(2,-1+2/(1-I*c*x))/d^2-I*b*e^2*(a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))
/d^3+1/2*b^2*e^2*polylog(3,1-2/(1-I*c*x))/d^3-1/2*b^2*e^2*polylog(3,1-2/(1+
I*c*x))/d^3+1/2*b^2*e^2*polylog(3,-1+2/(1+I*c*x))/d^3-1/2*b^2*e^2*polylog(3
,1-2*c*(e*x+d)/(c*d+I*e)/(1-I*c*x))/d^3
```

Rubi [A] time = 0.84, antiderivative size = 591, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 16, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.762, Rules used = {4876, 4852, 4918, 266, 36, 29, 31, 4884, 4924, 4868, 2447, 4850, 4988, 4994, 6610, 4858}

$$-\frac{ibe^2\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}-\frac{ibe^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}+\frac{ibe^2\text{PolyLog}\left(2,\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^3*(d + e*x)),x]
```

```
[Out] -((b*c*(a + b*ArcTan[c*x]))/(d*x)) - (c^2*(a + b*ArcTan[c*x])^2)/(2*d) + (I
*c*e*(a + b*ArcTan[c*x])^2)/d^2 - (a + b*ArcTan[c*x])^2/(2*d*x^2) + (e*(a +
 b*ArcTan[c*x])^2)/(d^2*x) + (2*e^2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1
+ I*c*x)])/d^3 + (b^2*c^2*Log[x])/d + (e^2*(a + b*ArcTan[c*x])^2*Log[2/(1 -
 I*c*x)])/d^3 - (e^2*(a + b*ArcTan[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)
*(1 - I*c*x))])/d^3 - (b^2*c^2*Log[1 + c^2*x^2])/(2*d) - (2*b*c*e*(a + b*Ar
cTan[c*x])*Log[2 - 2/(1 - I*c*x)])/d^2 - (I*b*e^2*(a + b*ArcTan[c*x])*PolyL
og[2, 1 - 2/(1 - I*c*x)])/d^3 + (I*b^2*c*e*PolyLog[2, -1 + 2/(1 - I*c*x)])/
d^2 - (I*b*e^2*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/d^3 + (I*
b*e^2*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d^3 + (I*b*e^2*(a
 + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))]
)/d^3 + (b^2*e^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*d^3) - (b^2*e^2*PolyLog[
3, 1 - 2/(1 + I*c*x)])/(2*d^3) + (b^2*e^2*PolyLog[3, -1 + 2/(1 + I*c*x)])/(
2*d^3) - (b^2*e^2*PolyLog[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))]
)/(2*d^3)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4876

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (f*
x)^m*(d + e*x)^q, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && IGtQ[p, 0] &
& IntegerQ[q] && (GtQ[q, 0] || NeQ[a, 0] || IntegerQ[m])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3(d+ex)}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx^3} - \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d^2x^2} + \frac{e^2\left(a+b\tan^{-1}(cx)\right)^2}{d^3x} - \frac{e^3\left(a+b\tan^{-1}\right.}{d^3(d+e\right.}$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}dx}{d} - \frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}dx}{d^2} + \frac{e^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}dx}{d^3} - \frac{e^3\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex}}{d^3}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{2e^2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right.}{d^3}$$

$$= \frac{ice\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} + \frac{2e^2\left(a+b\tan^{-1}(\right.}{}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} + \frac{ice\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan^{-1}(\right.}{2dx^2}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} + \frac{ice\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan^{-1}(\right.}{2dx^2}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} + \frac{ice\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan^{-1}(\right.}{2dx^2}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} + \frac{ice\left(a+b\tan^{-1}(cx)\right)^2}{d^2} - \frac{\left(a+b\tan^{-1}(\right.}{2dx^2}$$

Mathematica [A] time = 21.88, size = 1173, normalized size = 1.98

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^3*(d + e*x)),x]
```

```
[Out] -1/2*a^2/(d*x^2) + (a^2*e)/(d^2*x) + (a^2*e^2*Log[x])/d^3 - (a^2*e^2*Log[d
+ e*x])/d^3 - (a*b*((c^2*d^3)/x + I*c*d*e^2*Pi*ArcTan[c*x] - (2*c*d^2*e*Arc
Tan[c*x])/x + (c*d^3*(1 + c^2*x^2)*ArcTan[c*x])/x^2 - (2*I)*c*d*e^2*ArcTan[
(c*d)/e]*ArcTan[c*x] + I*c*d*e^2*ArcTan[c*x]^2 + e^3*ArcTan[c*x]^2 - Sqrt[1
 + (c^2*d^2)/e^2]*e^3*E^(I*ArcTan[(c*d)/e])*ArcTan[c*x]^2 + c*d*e^2*Pi*Log[
1 + E^((-2*I)*ArcTan[c*x])] - 2*c*d*e^2*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan
[c*x])] + 2*c*d*e^2*ArcTan[(c*d)/e]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + Arc
Tan[c*x]))] + 2*c*d*e^2*ArcTan[c*x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + Arc
Tan[c*x]))] + 2*c^2*d^2*e*Log[(c*x)/Sqrt[1 + c^2*x^2]] + (c*d*e^2*Pi*Log[1
+ c^2*x^2])/2 - 2*c*d*e^2*ArcTan[(c*d)/e]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[
c*x]]] + I*c*d*e^2*PolyLog[2, E^((2*I)*ArcTan[c*x])] - I*c*d*e^2*PolyLog[2,
 E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))]))/(c*d^4) + (b^2*((-I)*c*d*e^2*
Pi^3 - (24*c^2*d^3*ArcTan[c*x])/x + (24*I)*c^2*d^2*e*ArcTan[c*x]^2 + (24*c*
d^2*e*ArcTan[c*x]^2)/x - (12*c*d^3*(1 + c^2*x^2)*ArcTan[c*x]^2)/x^2 - 16*e^
3*ArcTan[c*x]^3 + 16*Sqrt[1 + (c^2*d^2)/e^2]*e^3*E^(I*ArcTan[(c*d)/e])*ArcT
an[c*x]^3 + 24*c*d*e^2*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 24*c
*d*e^2*Pi*ArcTan[c*x]*Log[1 + E^((-2*I)*ArcTan[c*x])] - 48*c^2*d^2*e*ArcTan
[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] - 48*c*d*e^2*ArcTan[(c*d)/e]*ArcTan[c*
x]*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] - 48*c*d*e^2*ArcTan[c
*x]^2*Log[1 - E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))] + 24*c*d*e^2*Pi*Ar
cTan[c*x]*Log[(-2*I)/(-I + c*x)] + 24*c^3*d^3*Log[(c*x)/Sqrt[1 + c^2*x^2]]
- 48*c*d*e^2*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[(I + c*x + E^((2*I)*ArcTan[(c*
d)/e])*(-I + c*x))/(2*E^(I*ArcTan[(c*d)/e])*Sqrt[1 + c^2*x^2])] + 48*c*d*e^
```

```
2*ArcTan[(c*d)/e]*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTa
n[c*x]] - I*E^((2*I)*ArcTan[(c*d)/e])*Sin[2*ArcTan[c*x]]] + 24*c*d*e^2*ArcT
an[c*x]^2*Log[1 - E^((2*I)*ArcTan[(c*d)/e])*Cos[2*ArcTan[c*x]] - I*E^((2*I)
*ArcTan[(c*d)/e])*Sin[2*ArcTan[c*x]]] + 48*c*d*e^2*ArcTan[(c*d)/e]*ArcTan[c
*x]*Log[Sin[ArcTan[(c*d)/e] + ArcTan[c*x]]] + (24*I)*c*d*e^2*ArcTan[c*x]*Po
lyLog[2, E^((-2*I)*ArcTan[c*x])] + (24*I)*c^2*d^2*e*PolyLog[2, E^((2*I)*Arc
Tan[c*x])] + (24*I)*c*d*e^2*ArcTan[c*x]*PolyLog[2, E^((2*I)*(ArcTan[(c*d)/e
] + ArcTan[c*x]))] + 12*c*d*e^2*PolyLog[3, E^((-2*I)*ArcTan[c*x])] - 12*c*d
*e^2*PolyLog[3, E^((2*I)*(ArcTan[(c*d)/e] + ArcTan[c*x]))]))/(24*c*d^4)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \arctan(cx)^2 + 2\,ab\arctan(cx) + a^2}{ex^4 + dx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x^4 + d*x^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 65.50, size = 2861, normalized size = 4.84

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^3/(e*x+d),x)
```

```
[Out] -1/2*a^2/d/x^2+1/2*I*b^2/d^3*e^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*
c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-c*b^2*e^2*arctan(c*x)*polylog(2,(I*e
-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/d^2/(e+I*d*c)+I*a*b*e^2/d^3*ln(c*x
)*ln(1+I*c*x)+I*b^2*e^3*arctan(c*x)*polylog(2,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)
^2/(c^2*x^2+1))/d^3/(e+I*d*c)+I*a*b/d^3*e^2*ln(c*e*x+c*d)*ln((I*e+c*e*x)/(I
*e-d*c))-1/2*I*c*b^2*e^2*polylog(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2
+1))/d^2/(e+I*d*c)-2*c*b^2/d^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))*arctan(c*x
)*e-2*c*a*b/d^2*e*ln(c*x)+c*a*b/d^2*e*ln(c^2*x^2+1)+I*c*b^2/d^2*e*arctan(c*
x)^2-I*a*b/d^3*e^2*dilog((I*e-c*e*x)/(d*c+I*e))+1/2*I*b^2/d^3*e^2*Pi*arctan
(c*x)^2-I*a*b*e^2/d^3*dilog(1-I*c*x)-2*I*b^2/d^3*e^2*arctan(c*x)*polylog(2,
-(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*b^2/d^3*e^2*arctan(c*x)*polylog(2,(1+I*c*
x)/(c^2*x^2+1)^(1/2))-2*I*c*b^2*dilog((1+I*c*x)/(c^2*x^2+1)^(1/2))/d^2*e+2*
I*c*b^2/d^2*dilog(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))*e-b^2*e^3*arctan(c*x)^2*ln
(1-(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/d^3/(e+I*d*c)+I*a*b/d^3*e^2
*dilog((I*e+c*e*x)/(I*e-d*c))+I*a*b*e^2/d^3*dilog(1+I*c*x)+2*a*b*arctan(c*x
)/d^2*e/x+2*a*b*arctan(c*x)/d^3*e^2*ln(c*x)-2*a*b*arctan(c*x)/d^3*e^2*ln(c*
e*x+c*d)-1/2*I*b^2/d^3*e^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)
^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1
)+1))^2*arctan(c*x)^2-1/2*I*b^2/d^3*e^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+
1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arcta
n(c*x)^2+1/2*I*b^2/d^3*e^2*Pi*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I
*c*x)^2/(c^2*x^2+1)+I*e+d*c))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I
*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1
```

```
/2*I*b^2/d^3*e^2*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*(-I*(1+I*c*x
)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^
2+1)+1))^2*arctan(c*x)^2-I*c*b^2*e^2*arctan(c*x)^2*ln(1-(I*e-d*c)/(d*c+I*e)
*(1+I*c*x)^2/(c^2*x^2+1))/d^2/(e+I*d*c)-1/2*I*b^2/d^3*e^2*Pi*csgn(I*((1+I*c
*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*
x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2/d^3*e^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^
2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I
*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/2*I*b^2/d^3*e^2*Pi*csgn(I/((1+I*c*x
)^2/(c^2*x^2+1)+1))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c
^2*x^2+1)+I*e+d*c))*csgn(I*(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c
^2*x^2+1)+I*e+d*c)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+1/2*I*b^2/d^3
*e^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)
+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan
(c*x)^2-c*a*b/d/x-c^2*a*b/d*arctan(c*x)-c*b^2*arctan(c*x)/x/d+b^2*arctan(c*
x)^2/d^3*e^2*ln(c*x)-b^2*arctan(c*x)^2/d^3*e^2*ln(c*e*x+c*d)+b^2/d^3*e^2*ar
ctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2*arctan(c*x)^2/d^2*e/x+b^2
*e^2/d^3*arctan(c*x)^2*ln(-I*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2
*x^2+1)+I*e+d*c)-b^2/d^3*e^2*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)-a*
b*arctan(c*x)/d/x^2+b^2/d^3*e^2*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1
/2))-1/2*b^2*e^3*polylog(3,(I*e-d*c)/(d*c+I*e)*(1+I*c*x)^2/(c^2*x^2+1))/d^3
/(e+I*d*c)-I*c^2*b^2*arctan(c*x)/d-1/2*c^2*b^2/d*arctan(c*x)^2+c^2*b^2/d*ln
((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)+c^2*b^2/d*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))
+2*b^2/d^3*e^2*polylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*b^2/d^3*e^2*polylo
g(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+a^2/d^3*e^2*ln(c*x)-a^2/d^3*e^2*ln(c*e*x+c
*d)-1/2*b^2*arctan(c*x)^2/d/x^2+a^2/d^2*e/x-1/2*I*b^2/d^3*e^2*Pi*csgn(I*(-I
*(1+I*c*x)^2/(c^2*x^2+1)*e+c*d*(1+I*c*x)^2/(c^2*x^2+1)+I*e+d*c)/((1+I*c*x)^
2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-1/2*I*b^2/d^3*e^2*Pi*csgn(((1+I*c*x)^2/(c
^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2/d^3*e^2
*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arcta
n(c*x)^2-I*a*b/d^3*e^2*ln(c*e*x+c*d)*ln((I*e-c*e*x)/(d*c+I*e))-I*a*b*e^2/d^
3*ln(c*x)*ln(1-I*c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a^2\left(\frac{2\,e^2\log\left(ex+d\right)}{d^3}-\frac{2\,e^2\log(x)}{d^3}-\frac{2\,ex-d}{d^2x^2}\right)+\frac{2\,d^2x^2\int\frac{12\left(b^2c^2d^2x^2+b^2d^2\right)\arctan(cx)^2+\left(b^2c^2d^2x^2+b^2d^2\right)\log\left(c^2x^2+1\right)^2-4\left(2\,b\right.}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(2*e^2*log(e*x + d)/d^3 - 2*e^2*log(x)/d^3 - (2*e*x - d)/(d^2*x^2)
) + 1/32*(32*d^2*x^2*integrate(1/16*(12*(b^2*c^2*d^2*x^2 + b^2*d^2)*arctan(
c*x)^2 + (b^2*c^2*d^2*x^2 + b^2*d^2)*log(c^2*x^2 + 1)^2 - 4*(2*b^2*c*e^2*x^
3 - b^2*c*d^2*x - 8*a*b*d^2 - (8*a*b*c^2*d^2 - b^2*c*d*e)*x^2)*arctan(c*x)
+ 2*(2*b^2*c^2*e^2*x^4 + b^2*c^2*d*e*x^3 - b^2*c^2*d^2*x^2)*log(c^2*x^2 + 1
))/(c^2*d^2*e*x^6 + c^2*d^3*x^5 + d^2*e*x^4 + d^3*x^3), x) + 4*(2*b^2*e*x -
 b^2*d)*arctan(c*x)^2 - (2*b^2*e*x - b^2*d)*log(c^2*x^2 + 1)^2)/(d^2*x^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{x^3\,\left(d+e\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^3*(d + e*x)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^3*(d + e*x)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{atan}(cx))^2}{x^3 (d + ex)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**3/(e*x+d),x)
```

```
[Out] Integral((a + b*atan(c*x))**2/(x**3*(d + e*x)), x)
```

3.148 $\int \frac{1}{(d+ex)\left(a+b\tan^{-1}(cx)\right)}\,dx$

Optimal. Leaf size=21

$$\text{Int}\left(\frac{1}{(d+ex)\left(a+b\tan^{-1}(cx)\right)},x\right)$$

```
[Out] Unintegrable(1/(e*x+d)/(a+b*arctan(c*x)),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{(d+ex)\left(a+b\tan^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/((d + e*x)*(a + b*ArcTan[c*x])),x]
[Out] Defer[Int][1/((d + e*x)*(a + b*ArcTan[c*x])), x]
```

Rubi steps

$$\int \frac{1}{(d+ex)\left(a+b\tan^{-1}(cx)\right)}\,dx=\int \frac{1}{(d+ex)\left(a+b\tan^{-1}(cx)\right)}\,dx$$

Mathematica [A] time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{1}{(d+ex)\left(a+b\tan^{-1}(cx)\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/((d + e*x)*(a + b*ArcTan[c*x])),x]
[Out] Integrate[1/((d + e*x)*(a + b*ArcTan[c*x])), x]
```

fricas [A] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{aex+ad+(bex+bd)\arctan(cx)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral(1/(a*e*x + a*d + (b*e*x + b*d)*arctan(c*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*arctan(c*x)),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)(a+b\arctan(cx))}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(e*x+d)/(a+b*arctan(c*x)),x)
[Out] int(1/(e*x+d)/(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(ex+d)(b\arctan(cx)+a)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate(1/((e*x + d)*(b*arctan(c*x) + a)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{1}{(a+b\,\mathrm{atan}(c\,x))\,(d+e\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/((a + b*atan(c*x))*(d + e*x)),x)
[Out] int(1/((a + b*atan(c*x))*(d + e*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{(a+b\,\mathrm{atan}(cx))(d+ex)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(e*x+d)/(a+b*atan(c*x)),x)
[Out] Integral(1/((a + b*atan(c*x))*(d + e*x)), x)
```

3.149 $\int x^3 \left(c + a^2 c x^2\right) \tan^{-1}(ax)\,dx$

Optimal. Leaf size=69

$$-\frac{c\tan^{-1}(ax)}{12a^4} + \frac{cx}{12a^3} + \frac{1}{6}a^2cx^6\tan^{-1}(ax) - \frac{1}{30}acx^5 + \frac{1}{4}cx^4\tan^{-1}(ax) - \frac{cx^3}{36a}$$

```
[Out] 1/12*c*x/a^3-1/36*c*x^3/a-1/30*a*c*x^5-1/12*c*arctan(a*x)/a^4+1/4*c*x^4*arc
tan(a*x)+1/6*a^2*c*x^6*arctan(a*x)
```

Rubi [A] time = 0.09, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4950, 4852, 302, 203}

$$\frac{1}{6}a^2cx^6\tan^{-1}(ax) + \frac{cx}{12a^3} - \frac{c\tan^{-1}(ax)}{12a^4} - \frac{1}{30}acx^5 - \frac{cx^3}{36a} + \frac{1}{4}cx^4\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] (c*x)/(12*a^3) - (c*x^3)/(36*a) - (a*c*x^5)/30 - (c*ArcTan[a*x])/(12*a^4) +
 (c*x^4*ArcTan[a*x])/4 + (a^2*c*x^6*ArcTan[a*x])/6
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int x^3 \left(c + a^2 c x^2\right) \tan^{-1}(ax)\, dx = c \int x^3 \tan^{-1}(ax)\, dx + \left(a^2 c\right) \int x^5 \tan^{-1}(ax)\, dx$$
$$= \frac{1}{4} c x^4 \tan^{-1}(ax) + \frac{1}{6} a^2 c x^6 \tan^{-1}(ax) - \frac{1}{4}(ac) \int \frac{x^4}{1 + a^2 x^2}\, dx - \frac{1}{6}\left(a^3 c\right) \int \frac{x^6}{1 + a}$$
$$= \frac{1}{4} c x^4 \tan^{-1}(ax) + \frac{1}{6} a^2 c x^6 \tan^{-1}(ax) - \frac{1}{4}(ac) \int \left(-\frac{1}{a^4} + \frac{x^2}{a^2} + \frac{1}{a^4\left(1 + a^2 x^2\right)}\right) d$$
$$= \frac{cx}{12a^3} - \frac{cx^3}{36a} - \frac{1}{30} a c x^5 + \frac{1}{4} c x^4 \tan^{-1}(ax) + \frac{1}{6} a^2 c x^6 \tan^{-1}(ax) + \frac{c \int \frac{1}{1+a^2x^2}\, dx}{6a^3}$$
$$= \frac{cx}{12a^3} - \frac{cx^3}{36a} - \frac{1}{30} a c x^5 - \frac{c \tan^{-1}(ax)}{12a^4} + \frac{1}{4} c x^4 \tan^{-1}(ax) + \frac{1}{6} a^2 c x^6 \tan^{-1}(ax)$$

Mathematica [A] time = 0.01, size = 69, normalized size = 1.00

$$-\frac{c \tan^{-1}(ax)}{12a^4} + \frac{cx}{12a^3} + \frac{1}{6} a^2 c x^6 \tan^{-1}(ax) - \frac{1}{30} a c x^5 + \frac{1}{4} c x^4 \tan^{-1}(ax) - \frac{cx^3}{36a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] (c*x)/(12*a^3) - (c*x^3)/(36*a) - (a*c*x^5)/30 - (c*ArcTan[a*x])/(12*a^4) +
 (c*x^4*ArcTan[a*x])/4 + (a^2*c*x^6*ArcTan[a*x])/6
```

fricas [A] time = 0.95, size = 57, normalized size = 0.83

$$-\frac{6\, a^5 c x^5 + 5\, a^3 c x^3 - 15\, acx - 15 \left(2\, a^6 c x^6 + 3\, a^4 c x^4 - c\right) \arctan(ax)}{180\, a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/180*(6*a^5*c*x^5 + 5*a^3*c*x^3 - 15*a*c*x - 15*(2*a^6*c*x^6 + 3*a^4*c*x^
4 - c)*arctan(a*x))/a^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.02, size = 58, normalized size = 0.84

$$\frac{cx}{12a^3} - \frac{c\,x^3}{36a} - \frac{ac\,x^5}{30} - \frac{c \arctan(ax)}{12a^4} + \frac{c\,x^4 \arctan(ax)}{4} + \frac{a^2 c\,x^6 \arctan(ax)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)*arctan(a*x),x)
```

```
[Out] 1/12*c*x/a^3-1/36*c*x^3/a-1/30*a*c*x^5-1/12*c*arctan(a*x)/a^4+1/4*c*x^4*arc
tan(a*x)+1/6*a^2*c*x^6*arctan(a*x)
```

maxima [A] time = 0.43, size = 64, normalized size = 0.93

$$-\frac{1}{180}\,a\left(\frac{6\,a^4cx^5+5\,a^2cx^3-15\,cx}{a^4}+\frac{15\,c\arctan\left(ax\right)}{a^5}\right)+\frac{1}{12}\left(2\,a^2cx^6+3\,cx^4\right)\arctan\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/180*a*((6*a^4*c*x^5 + 5*a^2*c*x^3 - 15*c*x)/a^4 + 15*c*arctan(a*x)/a^5)
+ 1/12*(2*a^2*c*x^6 + 3*c*x^4)*arctan(a*x)
```

mupad [B] time = 0.31, size = 57, normalized size = 0.83

$$-\frac{c\,\left(15\,\mathrm{atan}\left(a\,x\right)-15\,a\,x+5\,a^3\,x^3+6\,a^5\,x^5-45\,a^4\,x^4\,\mathrm{atan}\left(a\,x\right)-30\,a^6\,x^6\,\mathrm{atan}\left(a\,x\right)\right)}{180\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)*(c + a^2*c*x^2),x)
```

```
[Out] -(c*(15*atan(a*x) - 15*a*x + 5*a^3*x^3 + 6*a^5*x^5 - 45*a^4*x^4*atan(a*x) -
 30*a^6*x^6*atan(a*x)))/(180*a^4)
```

sympy [A] time = 1.46, size = 65, normalized size = 0.94

$$\begin{cases} \frac{a^2cx^6\,\mathrm{atan}\left(ax\right)}{6}-\frac{acx^5}{30}+\frac{cx^4\,\mathrm{atan}\left(ax\right)}{4}-\frac{cx^3}{36a}+\frac{cx}{12a^3}-\frac{c\,\mathrm{atan}\left(ax\right)}{12a^4} & \text{for}\ a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)*atan(a*x),x)
```

```
[Out] Piecewise((a**2*c*x**6*atan(a*x)/6 - a*c*x**5/30 + c*x**4*atan(a*x)/4 - c*x
**3/(36*a) + c*x/(12*a**3) - c*atan(a*x)/(12*a**4), Ne(a, 0)), (0, True))
```

3.150 $\int x^2 \left(c + a^2 c x^2\right) \tan^{-1}(ax) \, dx$

Optimal. Leaf size=66

$$\frac{1}{5}a^2cx^5\tan^{-1}(ax) + \frac{c\log\left(a^2x^2+1\right)}{15a^3} - \frac{1}{20}acx^4 + \frac{1}{3}cx^3\tan^{-1}(ax) - \frac{cx^2}{15a}$$

```
[Out] -1/15*c*x^2/a-1/20*a*c*x^4+1/3*c*x^3*arctan(a*x)+1/5*a^2*c*x^5*arctan(a*x)+
1/15*c*ln(a^2*x^2+1)/a^3
```

Rubi [A] time = 0.09, antiderivative size = 66, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4950, 4852, 266, 43}

$$\frac{c\log\left(a^2x^2+1\right)}{15a^3} + \frac{1}{5}a^2cx^5\tan^{-1}(ax) - \frac{1}{20}acx^4 - \frac{cx^2}{15a} + \frac{1}{3}cx^3\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] -(c*x^2)/(15*a) - (a*c*x^4)/20 + (c*x^3*ArcTan[a*x])/3 + (a^2*c*x^5*ArcTan[
a*x])/5 + (c*Log[1 + a^2*x^2])/(15*a^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int x^2 \left(c + a^2 c x^2\right) \tan^{-1}(ax)\, dx = c \int x^2 \tan^{-1}(ax)\, dx + \left(a^2 c\right) \int x^4 \tan^{-1}(ax)\, dx$$

$$= \frac{1}{3} c x^3 \tan^{-1}(ax) + \frac{1}{5} a^2 c x^5 \tan^{-1}(ax) - \frac{1}{3}(ac) \int \frac{x^3}{1 + a^2 x^2}\, dx - \frac{1}{5}\left(a^3 c\right) \int \frac{x^5}{1 + a^2 x^2}$$

$$= \frac{1}{3} c x^3 \tan^{-1}(ax) + \frac{1}{5} a^2 c x^5 \tan^{-1}(ax) - \frac{1}{6}(ac)\, \text{Subst}\left(\int \frac{x}{1 + a^2 x}\, dx, x, x^2\right) - \frac{1}{10}\left(a\right.$$

$$= \frac{1}{3} c x^3 \tan^{-1}(ax) + \frac{1}{5} a^2 c x^5 \tan^{-1}(ax) - \frac{1}{6}(ac)\, \text{Subst}\left(\int \left(\frac{1}{a^2} - \frac{1}{a^2 \left(1 + a^2 x\right)}\right) dx, x\right.$$

$$= -\frac{c x^2}{15 a} - \frac{1}{20} a c x^4 + \frac{1}{3} c x^3 \tan^{-1}(ax) + \frac{1}{5} a^2 c x^5 \tan^{-1}(ax) + \frac{c \log\left(1 + a^2 x^2\right)}{15 a^3}$$

Mathematica [A]   time = 0.02, size = 66, normalized size = 1.00

$$\frac{1}{5} a^2 c x^5 \tan^{-1}(ax) + \frac{c \log\left(a^2 x^2 + 1\right)}{15 a^3} - \frac{1}{20} a c x^4 + \frac{1}{3} c x^3 \tan^{-1}(ax) - \frac{c x^2}{15 a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] -1/15*(c*x^2)/a - (a*c*x^4)/20 + (c*x^3*ArcTan[a*x])/3 + (a^2*c*x^5*ArcTan[
a*x])/5 + (c*Log[1 + a^2*x^2])/(15*a^3)
```

fricas [A]   time = 0.68, size = 62, normalized size = 0.94

$$-\frac{3\, a^4 c x^4 + 4\, a^2 c x^2 - 4 \left(3\, a^5 c x^5 + 5\, a^3 c x^3\right) \arctan(ax) - 4\, c \log\left(a^2 x^2 + 1\right)}{60\, a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/60*(3*a^4*c*x^4 + 4*a^2*c*x^2 - 4*(3*a^5*c*x^5 + 5*a^3*c*x^3)*arctan(a*x
) - 4*c*log(a^2*x^2 + 1))/a^3
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A]   time = 0.03, size = 57, normalized size = 0.86

$$-\frac{c\, x^2}{15 a} - \frac{a c\, x^4}{20} + \frac{c\, x^3 \arctan(ax)}{3} + \frac{a^2 c\, x^5 \arctan(ax)}{5} + \frac{c \ln\left(a^2 x^2 + 1\right)}{15 a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)*arctan(a*x),x)
```

```
[Out] -1/15*c*x^2/a-1/20*a*c*x^4+1/3*c*x^3*arctan(a*x)+1/5*a^2*c*x^5*arctan(a*x)+
1/15*c*ln(a^2*x^2+1)/a^3
```

maxima [A] time = 0.32, size = 63, normalized size = 0.95

$$-\frac{1}{60}\,a\left(\frac{3\,a^2cx^4+4\,cx^2}{a^2}-\frac{4\,c\log\left(a^2x^2+1\right)}{a^4}\right)+\frac{1}{15}\left(3\,a^2cx^5+5\,cx^3\right)\arctan\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/60*a*((3*a^2*c*x^4 + 4*c*x^2)/a^2 - 4*c*log(a^2*x^2 + 1)/a^4) + 1/15*(3*
a^2*c*x^5 + 5*c*x^3)*arctan(a*x)
```

mupad [B] time = 0.23, size = 58, normalized size = 0.88

$$\frac{\frac{c\,\ln\left(a^2\,x^2+1\right)}{15}-\frac{a^2\,c\,x^2}{15}}{a^3}+\frac{c\,x^3\,\mathrm{atan}\left(a\,x\right)}{3}-\frac{a\,c\,x^4}{20}+\frac{a^2\,c\,x^5\,\mathrm{atan}\left(a\,x\right)}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)*(c + a^2*c*x^2),x)
```

```
[Out] ((c*log(a^2*x^2 + 1))/15 - (a^2*c*x^2)/15)/a^3 + (c*x^3*atan(a*x))/3 - (a*c
*x^4)/20 + (a^2*c*x^5*atan(a*x))/5
```

sympy [A] time = 1.00, size = 61, normalized size = 0.92

$$\begin{cases} \frac{a^2cx^5\,\mathrm{atan}\left(ax\right)}{5}-\frac{acx^4}{20}+\frac{cx^3\,\mathrm{atan}\left(ax\right)}{3}-\frac{cx^2}{15a}+\frac{c\log\left(x^2+\frac{1}{a^2}\right)}{15a^3} & \text{for}\ a\neq 0\\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)*atan(a*x),x)
```

```
[Out] Piecewise((a**2*c*x**5*atan(a*x)/5 - a*c*x**4/20 + c*x**3*atan(a*x)/3 - c*x
**2/(15*a) + c*log(x**2 + a**(-2))/(15*a**3), Ne(a, 0)), (0, True))
```

3.151 $\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)\,dx$

Optimal. Leaf size=42

$$\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)}{4a^2}-\frac{1}{12}acx^3-\frac{cx}{4a}$$

```
[Out] -1/4*c*x/a-1/12*a*c*x^3+1/4*c*(a^2*x^2+1)^2*arctan(a*x)/a^2
```

Rubi [A] time = 0.02, antiderivative size = 42, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.062, Rules used = {4930}

$$\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)}{4a^2}-\frac{1}{12}acx^3-\frac{cx}{4a}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] -(c*x)/(4*a) - (a*c*x^3)/12 + (c*(1 + a^2*x^2)^2*ArcTan[a*x])/(4*a^2)
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)\,dx&=\frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{4a^2}-\frac{\int\left(c+a^2cx^2\right)dx}{4a}\\&=-\frac{cx}{4a}-\frac{1}{12}acx^3+\frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{4a^2}\end{aligned}$$

Mathematica [A] time = 0.00, size = 58, normalized size = 1.38

$$\frac{1}{4}a^2cx^4\tan^{-1}(ax)+\frac{c\tan^{-1}(ax)}{4a^2}-\frac{1}{12}acx^3+\frac{1}{2}cx^2\tan^{-1}(ax)-\frac{cx}{4a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] -1/4*(c*x)/a - (a*c*x^3)/12 + (c*ArcTan[a*x])/(4*a^2) + (c*x^2*ArcTan[a*x])
/2 + (a^2*c*x^4*ArcTan[a*x])/4
```

fricas [A] time = 0.61, size = 44, normalized size = 1.05

$$-\frac{a^3cx^3+3\,acx-3\left(a^4cx^4+2\,a^2cx^2+c\right)\arctan(ax)}{12\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="fricas")
```

[Out] -1/12*(a^3*c*x^3 + 3*a*c*x - 3*(a^4*c*x^4 + 2*a^2*c*x^2 + c)*arctan(a*x))/a^2

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 0.02, size = 49, normalized size = 1.17

$$\frac{a^2c\arctan(ax)x^4}{4}+\frac{c\arctan(ax)x^2}{2}-\frac{acx^3}{12}-\frac{cx}{4a}+\frac{c\arctan(ax)}{4a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a^2*c*x^2+c)*arctan(a*x),x)

[Out] 1/4*a^2*c*arctan(a*x)*x^4+1/2*c*arctan(a*x)*x^2-1/12*a*c*x^3-1/4*c*x/a+1/4/a^2*c*arctan(a*x)

maxima [A] time = 0.33, size = 50, normalized size = 1.19

$$\frac{\left(a^2cx^2+c\right)^2\arctan(ax)}{4\,a^2c}-\frac{a^2c^2x^3+3\,c^2x}{12\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="maxima")

[Out] 1/4*(a^2*c*x^2 + c)^2*arctan(a*x)/(a^2*c) - 1/12*(a^2*c^2*x^3 + 3*c^2*x)/(a*c)

mupad [B] time = 0.48, size = 48, normalized size = 1.14

$$\frac{\frac{c\,\mathrm{atan}(a\,x)}{4}-\frac{a\,c\,x}{4}}{a^2}+\frac{c\,x^2\,\mathrm{atan}\left(a\,x\right)}{2}-\frac{a\,c\,x^3}{12}+\frac{a^2\,c\,x^4\,\mathrm{atan}\left(a\,x\right)}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*atan(a*x)*(c + a^2*c*x^2),x)

[Out] ((c*atan(a*x))/4 - (a*c*x)/4)/a^2 + (c*x^2*atan(a*x))/2 - (a*c*x^3)/12 + (a^2*c*x^4*atan(a*x))/4

sympy [A] time = 0.80, size = 54, normalized size = 1.29

$$\begin{cases}\frac{a^2cx^4\,\mathrm{atan}(ax)}{4}-\frac{acx^3}{12}+\frac{cx^2\,\mathrm{atan}(ax)}{2}-\frac{cx}{4a}+\frac{c\,\mathrm{atan}(ax)}{4a^2} & \text{for}\ a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a**2*c*x**2+c)*atan(a*x),x)

[Out] Piecewise((a**2*c*x**4*atan(a*x)/4 - a*c*x**3/12 + c*x**2*atan(a*x)/2 - c*x/(4*a) + c*atan(a*x)/(4*a**2), Ne(a, 0)), (0, True))

3.152 $\int \left(c+a^2 c x^2\right) \tan^{-1}(ax)\,dx$

Optimal. Leaf size=50

$$\frac{1}{3}a^2cx^3\tan^{-1}(ax)-\frac{c\log\left(a^2x^2+1\right)}{3a}-\frac{1}{6}acx^2+cx\tan^{-1}(ax)$$

```
[Out] -1/6*a*c*x^2+c*x*arctan(a*x)+1/3*a^2*c*x^3*arctan(a*x)-1/3*c*ln(a^2*x^2+1)/
a
```

Rubi [A] time = 0.02, antiderivative size = 65, normalized size of antiderivative = 1.30, number of steps used = 3, number of rules used = 3, integrand size = 15, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4878, 4846, 260}

$$-\frac{c\left(a^2x^2+1\right)}{6a}-\frac{c\log\left(a^2x^2+1\right)}{3a}+\frac{1}{3}cx\left(a^2x^2+1\right)\tan^{-1}(ax)+\frac{2}{3}cx\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] -(c*(1 + a^2*x^2))/(6*a) + (2*c*x*ArcTan[a*x])/3 + (c*x*(1 + a^2*x^2)*ArcTa
n[a*x])/3 - (c*Log[1 + a^2*x^2])/(3*a)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)\tan^{-1}(ax)\,dx &= -\frac{c\left(1+a^2x^2\right)}{6a}+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)+\frac{1}{3}(2c)\int \tan^{-1}(ax)\,dx\\ &= -\frac{c\left(1+a^2x^2\right)}{6a}+\frac{2}{3}cx\tan^{-1}(ax)+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)-\frac{1}{3}(2ac)\int \frac{x}{1+a^2x^2}\,dx\\ &= -\frac{c\left(1+a^2x^2\right)}{6a}+\frac{2}{3}cx\tan^{-1}(ax)+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)-\frac{c\log\left(1+a^2x^2\right)}{3a}\end{aligned}$$

Mathematica [A] time = 0.01, size = 50, normalized size = 1.00

$$\frac{1}{3}a^2cx^3\tan^{-1}(ax)-\frac{c\log\left(a^2x^2+1\right)}{3a}-\frac{1}{6}acx^2+cx\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] -1/6*(a*c*x^2) + c*x*ArcTan[a*x] + (a^2*c*x^3*ArcTan[a*x])/3 - (c*Log[1 + a
^2*x^2])/(3*a)
```

fricas [A] time = 1.01, size = 47, normalized size = 0.94

$$-\frac{a^{2} c x^{2} - 2 \left(a^{3} c x^{3} + 3 \, a c x\right) \arctan \left(a x\right) + 2 \, c \log \left(a^{2} x^{2} + 1\right)}{6 \, a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/6*(a^2*c*x^2 - 2*(a^3*c*x^3 + 3*a*c*x)*arctan(a*x) + 2*c*log(a^2*x^2 + 1
))/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_{0} x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.02, size = 45, normalized size = 0.90

$$-\frac{a\,x^{2} c}{6}+c x \arctan \left(a x \right)+\frac{a^{2} c\,x^{3} \arctan \left(a x \right)}{3}-\frac{c \ln \left(a^{2} x^{2}+1\right)}{3 a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x),x)
```

```
[Out] -1/6*a*x^2*c+c*x*arctan(a*x)+1/3*a^2*c*x^3*arctan(a*x)-1/3*c*ln(a^2*x^2+1)/
a
```

maxima [A] time = 0.33, size = 45, normalized size = 0.90

$$-\frac{1}{6} \left(c x^{2} + \frac{2 \, c \log \left(a^{2} x^{2} + 1\right)}{a^{2}}\right) a + \frac{1}{3} \left(a^{2} c x^{3} + 3 \, c x\right) \arctan \left(a x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/6*(c*x^2 + 2*c*log(a^2*x^2 + 1)/a^2)*a + 1/3*(a^2*c*x^3 + 3*c*x)*arctan(
a*x)
```

mupad [B] time = 0.16, size = 46, normalized size = 0.92

$$-\frac{c\,\left(2\,\ln\left(a^2\,x^2+1\right)+a^2\,x^2-2\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right)-6\,a\,x\,\mathrm{atan}\left(a\,x\right)\right)}{6\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)*(c + a^2*c*x^2),x)
```

```
[Out] -(c*(2*log(a^2*x^2 + 1) + a^2*x^2 - 2*a^3*x^3*atan(a*x) - 6*a*x*atan(a*x)))
/(6*a)
```

<u>**sympy**</u> [**A**] time = 0.57, size = 48, normalized size = 0.96

$$\begin{cases} \frac{a^2cx^3 \operatorname{atan}(ax)}{3} - \frac{acx^2}{6} + cx \operatorname{atan}(ax) - \frac{c \log\left(x^2 + \frac{1}{a^2}\right)}{3a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x),x)
```

```
[Out] Piecewise((a**2*c*x**3*atan(a*x)/3 - a*c*x**2/6 + c*x*atan(a*x) - c*log(x**
2 + a**(-2))/(3*a), Ne(a, 0)), (0, True))
```

3.153 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)}{x}\,dx$

Optimal. Leaf size=62

$$\frac{1}{2}a^2cx^2\tan^{-1}(ax)+\frac{1}{2}ic\text{Li}_2(-iax)-\frac{1}{2}ic\text{Li}_2(iax)-\frac{acx}{2}+\frac{1}{2}c\tan^{-1}(ax)$$

```
[Out] -1/2*a*c*x+1/2*c*arctan(a*x)+1/2*a^2*c*x^2*arctan(a*x)+1/2*I*c*polylog(2,-I
*a*x)-1/2*I*c*polylog(2,I*a*x)
```

Rubi [A] time = 0.07, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4950, 4848, 2391, 4852, 321, 203}

$$\frac{1}{2}ic\text{PolyLog}(2,-iax)-\frac{1}{2}ic\text{PolyLog}(2,iax)+\frac{1}{2}a^2cx^2\tan^{-1}(ax)-\frac{acx}{2}+\frac{1}{2}c\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x])/x,x]
```

```
[Out] -(a*c*x)/2 + (c*ArcTan[a*x])/2 + (a^2*c*x^2*ArcTan[a*x])/2 + (I/2)*c*PolyLo
g[2, (-I)*a*x] - (I/2)*c*PolyLog[2, I*a*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
```

```
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\begin{aligned}\int \frac{(c+a^2cx^2)\tan^{-1}(ax)}{x}\,dx &= c\int \frac{\tan^{-1}(ax)}{x}\,dx + (a^2c)\int x\tan^{-1}(ax)\,dx\\ &= \frac{1}{2}a^2cx^2\tan^{-1}(ax) + \frac{1}{2}(ic)\int \frac{\log(1-iax)}{x}\,dx - \frac{1}{2}(ic)\int \frac{\log(1+iax)}{x}\,dx - \frac{1}{2}(a^3c)\\ &= -\frac{1}{2}acx + \frac{1}{2}a^2cx^2\tan^{-1}(ax) + \frac{1}{2}ic\text{Li}_2(-iax) - \frac{1}{2}ic\text{Li}_2(iax) + \frac{1}{2}(ac)\int \frac{1}{1+a^2x^2}\,dx\\ &= -\frac{1}{2}acx + \frac{1}{2}c\tan^{-1}(ax) + \frac{1}{2}a^2cx^2\tan^{-1}(ax) + \frac{1}{2}ic\text{Li}_2(-iax) - \frac{1}{2}ic\text{Li}_2(iax)\end{aligned}$$

Mathematica [A] time = 0.00, size = 62, normalized size = 1.00

$$\frac{1}{2}a^2cx^2\tan^{-1}(ax) + \frac{1}{2}ic\text{Li}_2(-iax) - \frac{1}{2}ic\text{Li}_2(iax) - \frac{acx}{2} + \frac{1}{2}c\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x])/x,x]
```

```
[Out] -1/2*(a*c*x) + (c*ArcTan[a*x])/2 + (a^2*c*x^2*ArcTan[a*x])/2 + (I/2)*c*Poly
Log[2, (-I)*a*x] - (I/2)*c*PolyLog[2, I*a*x]
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(a^2cx^2+c)\arctan(ax)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 93, normalized size = 1.50

$$\frac{a^2cx^2\arctan(ax)}{2} + c\arctan(ax)\ln(ax) + \frac{i\ln(ax)\ln(iax+1)c}{2} - \frac{i\ln(ax)\ln(-iax+1)c}{2} - \frac{i\,\text{dilog}(-iax+1)c}{2} + \frac{i\,\text{d}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)/x,x)
```

```
[Out] 1/2*a^2*c*x^2*arctan(a*x)+c*arctan(a*x)*ln(a*x)+1/2*I*ln(a*x)*ln(1+I*a*x)*c
-1/2*I*ln(a*x)*ln(1-I*a*x)*c-1/2*I*dilog(1-I*a*x)*c+1/2*I*dilog(1+I*a*x)*c-
1/2*a*c*x+1/2*c*arctan(a*x)
```

maxima [A] time = 0.49, size = 66, normalized size = 1.06

$$-\frac{1}{2}acx-\frac{1}{4}\pi c\log\left(a^2x^2+1\right)+c\arctan\left(ax\right)\log\left(ax\right)+\frac{1}{2}\left(a^2cx^2+c\right)\arctan\left(ax\right)-\frac{1}{2}icLi_2\left(iax+1\right)+\frac{1}{2}icLi_2\left(-ia$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x,x, algorithm="maxima")
```

```
[Out] -1/2*a*c*x - 1/4*pi*c*log(a^2*x^2 + 1) + c*arctan(a*x)*log(a*x) + 1/2*(a^2*
c*x^2 + c)*arctan(a*x) - 1/2*I*c*dilog(I*a*x + 1) + 1/2*I*c*dilog(-I*a*x +
1)
```

mupad [B] time = 0.55, size = 57, normalized size = 0.92

$$\begin{cases} 0 & \text{if } a=0 \\ a^2\,c\,\mathrm{atan}\left(a\,x\right)\,\left(\frac{1}{2\,a^2}+\frac{x^2}{2}\right)-\frac{a\,c\,x}{2}-\frac{c\,\left(\mathrm{Li_2}\left(1-a\,x\,1{}\mathrm{i}\right)-\mathrm{Li_2}\left(1+a\,x\,1{}\mathrm{i}\right)\right)\,1{}\mathrm{i}}{2} & \text{if } a\neq 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2))/x,x)
```

```
[Out] piecewise(a == 0, 0, a ~= 0, - (c*(dilog(- a*x*1i + 1) - dilog(a*x*1i + 1))
*1i)/2 - (a*c*x)/2 + a^2*c*atan(a*x)*(1/(2*a^2) + x^2/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int\frac{\mathrm{atan}\left(ax\right)}{x}\,dx+\int a^2x\,\mathrm{atan}\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)/x,x)
```

```
[Out] c*(Integral(atan(a*x)/x, x) + Integral(a**2*x*atan(a*x), x))
```

3.154 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)}{x^2}\,dx$

Optimal. Leaf size=40

$$-ac\log\left(a^2x^2+1\right)+a^2cx\tan^{-1}(ax)+ac\log(x)-\frac{c\tan^{-1}(ax)}{x}$$

[Out] -c*arctan(a*x)/x+a^2*c*x*arctan(a*x)+a*c*ln(x)-a*c*ln(a^2*x^2+1)

Rubi [A] time = 0.05, antiderivative size = 40, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4950, 4852, 266, 36, 29, 31, 4846, 260}

$$-ac\log\left(a^2x^2+1\right)+a^2cx\tan^{-1}(ax)+ac\log(x)-\frac{c\tan^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

[In] Int[((c + a^2*c*x^2)*ArcTan[a*x])/x^2,x]

[Out] -((c*ArcTan[a*x])/x) + a^2*c*x*ArcTan[a*x] + a*c*Log[x] - a*c*Log[1 + a^2*x^2]

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
```

```
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)}{x^2}\,dx &= c\int \frac{\tan^{-1}(ax)}{x^2}\,dx+\left(a^2c\right)\int \tan^{-1}(ax)\,dx\\
&= -\frac{c\tan^{-1}(ax)}{x}+a^2cx\tan^{-1}(ax)+(ac)\int \frac{1}{x\left(1+a^2x^2\right)}\,dx-\left(a^3c\right)\int \frac{x}{1+a^2x^2}\,dx\\
&= -\frac{c\tan^{-1}(ax)}{x}+a^2cx\tan^{-1}(ax)-\frac{1}{2}ac\log\left(1+a^2x^2\right)+\frac{1}{2}(ac)\,\text{Subst}\left(\int \frac{1}{x\left(1+a\right.}\right.\\
&= -\frac{c\tan^{-1}(ax)}{x}+a^2cx\tan^{-1}(ax)-\frac{1}{2}ac\log\left(1+a^2x^2\right)+\frac{1}{2}(ac)\,\text{Subst}\left(\int \frac{1}{x}\,dx,x,\right.\\
&= -\frac{c\tan^{-1}(ax)}{x}+a^2cx\tan^{-1}(ax)+ac\log(x)-ac\log\left(1+a^2x^2\right)
\end{aligned}
$$

Mathematica [A] time = 0.00, size = 40, normalized size = 1.00

$$-ac\log\left(a^2x^2+1\right)+a^2cx\tan^{-1}(ax)+ac\log(x)-\frac{c\tan^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x])/x^2,x]
```

```
[Out] -((c*ArcTan[a*x])/x) + a^2*c*x*ArcTan[a*x] + a*c*Log[x] - a*c*Log[1 + a^2*x
^2]
```

fricas [A] time = 0.48, size = 45, normalized size = 1.12

$$-\frac{acx\log\left(a^2x^2+1\right)-acx\log(x)-\left(a^2cx^2-c\right)\arctan(ax)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^2,x, algorithm="fricas")
```

```
[Out] -(a*c*x*log(a^2*x^2 + 1) - a*c*x*log(x) - (a^2*c*x^2 - c)*arctan(a*x))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 43, normalized size = 1.08

$$a^2cx\arctan(ax) - \frac{c\arctan(ax)}{x} - ac\ln\left(a^2x^2+1\right) + ac\ln(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)/x^2,x)
```

```
[Out] a^2*c*x*arctan(a*x)-c*arctan(a*x)/x-a*c*ln(a^2*x^2+1)+a*c*ln(a*x)
```

maxima [A] time = 0.33, size = 40, normalized size = 1.00

$$-\left(c\log\left(a^2x^2+1\right) - c\log(x)\right)a + \left(a^2cx - \frac{c}{x}\right)\arctan(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^2,x, algorithm="maxima")
```

```
[Out] -(c*log(a^2*x^2 + 1) - c*log(x))*a + (a^2*c*x - c/x)*arctan(a*x)
```

mupad [B] time = 0.16, size = 42, normalized size = 1.05

$$a^2\,c\,x\,\mathrm{atan}(a\,x) - \frac{c\,\mathrm{atan}(a\,x)}{x} - c\,\left(a\,\ln\left(a^2\,x^2+1\right) - a\,\ln(x)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2))/x^2,x)
```

```
[Out] a^2*c*x*atan(a*x) - (c*atan(a*x))/x - c*(a*log(a^2*x^2 + 1) - a*log(x))
```

sympy [A] time = 0.75, size = 41, normalized size = 1.02

$$\begin{cases} a^2cx\,\mathrm{atan}(ax) + ac\log(x) - ac\log\left(x^2+\frac{1}{a^2}\right) - \frac{c\,\mathrm{atan}(ax)}{x} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)/x**2,x)
```

```
[Out] Piecewise((a**2*c*x*atan(a*x) + a*c*log(x) - a*c*log(x**2 + a**(-2)) - c*at
an(a*x)/x, Ne(a, 0)), (0, True))
```

3.155 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)}{x^3}\,dx$

Optimal. Leaf size=70

$$\frac{1}{2}ia^2c\text{Li}_2(-iax)-\frac{1}{2}ia^2c\text{Li}_2(iax)-\frac{1}{2}a^2c\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)}{2x^2}-\frac{ac}{2x}$$

```
[Out] -1/2*a*c/x-1/2*a^2*c*arctan(a*x)-1/2*c*arctan(a*x)/x^2+1/2*I*a^2*c*polylog(
2,-I*a*x)-1/2*I*a^2*c*polylog(2,I*a*x)
```

Rubi [A] time = 0.07, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4950, 4852, 325, 203, 4848, 2391}

$$\frac{1}{2}ia^2c\text{PolyLog}(2,-iax)-\frac{1}{2}ia^2c\text{PolyLog}(2,iax)-\frac{1}{2}a^2c\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)}{2x^2}-\frac{ac}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x])/x^3,x]
```

```
[Out] -(a*c)/(2*x) - (a^2*c*ArcTan[a*x])/2 - (c*ArcTan[a*x])/(2*x^2) + (I/2)*a^2*
c*PolyLog[2, (-I)*a*x] - (I/2)*a^2*c*PolyLog[2, I*a*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
```

```
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\begin{aligned}\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)}{x^3}\,dx &= c\int \frac{\tan^{-1}(ax)}{x^3}\,dx+\left(a^2c\right)\int \frac{\tan^{-1}(ax)}{x}\,dx\\ &= -\frac{c\tan^{-1}(ax)}{2x^2}+\frac{1}{2}(ac)\int \frac{1}{x^2\left(1+a^2x^2\right)}\,dx+\frac{1}{2}\left(ia^2c\right)\int \frac{\log(1-iax)}{x}\,dx-\frac{1}{2}\left(ia^2c\right)\\ &= -\frac{ac}{2x}-\frac{c\tan^{-1}(ax)}{2x^2}+\frac{1}{2}ia^2c\text{Li}_2(-iax)-\frac{1}{2}ia^2c\text{Li}_2(iax)-\frac{1}{2}\left(a^3c\right)\int \frac{1}{1+a^2x^2}\,dx\\ &= -\frac{ac}{2x}-\frac{1}{2}a^2c\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)}{2x^2}+\frac{1}{2}ia^2c\text{Li}_2(-iax)-\frac{1}{2}ia^2c\text{Li}_2(iax)\end{aligned}$$

Mathematica [C] time = 0.01, size = 74, normalized size = 1.06

$$-\frac{ac\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-a^2x^2\right)}{2x}+\frac{1}{2}ia^2c\text{Li}_2(-iax)-\frac{1}{2}ia^2c\text{Li}_2(iax)-\frac{c\tan^{-1}(ax)}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x])/x^3,x]
```

```
[Out] -1/2*(c*ArcTan[a*x])/x^2 - (a*c*Hypergeometric2F1[-1/2, 1, 1/2, -(a^2*x^2)]
)/(2*x) + (I/2)*a^2*c*PolyLog[2, (-I)*a*x] - (I/2)*a^2*c*PolyLog[2, I*a*x]
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)\arctan\left(ax\right)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 110, normalized size = 1.57

$$a^2c\arctan\left(ax\right)\ln\left(ax\right)-\frac{c\arctan\left(ax\right)}{2x^2}-\frac{ac}{2x}-\frac{a^2c\arctan\left(ax\right)}{2}+\frac{ia^2c\ln\left(ax\right)\ln\left(iax+1\right)}{2}-\frac{ia^2c\ln\left(ax\right)\ln\left(-iax+1\right)}{2}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)/x^3,x)
```

```
[Out] a^2*c*arctan(a*x)*ln(a*x)-1/2*c*arctan(a*x)/x^2-1/2*a*c/x-1/2*a^2*c*arctan(
a*x)+1/2*I*a^2*c*ln(a*x)*ln(1+I*a*x)-1/2*I*a^2*c*ln(a*x)*ln(1-I*a*x)+1/2*I*
a^2*c*dilog(1+I*a*x)-1/2*I*a^2*c*dilog(1-I*a*x)
```

maxima [A] time = 0.50, size = 95, normalized size = 1.36

$$-\frac{\pi a^2cx^2\log\left(a^2x^2+1\right)-4\,a^2cx^2\arctan\left(ax\right)\log\left(ax\right)+2i\,a^2cx^2\mathrm{Li}_2\left(i\,ax+1\right)-2i\,a^2cx^2\mathrm{Li}_2\left(-i\,ax+1\right)+2\,acx}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^3,x, algorithm="maxima")
```

```
[Out] -1/4*(pi*a^2*c*x^2*log(a^2*x^2 + 1) - 4*a^2*c*x^2*arctan(a*x)*log(a*x) + 2*
I*a^2*c*x^2*dilog(I*a*x + 1) - 2*I*a^2*c*x^2*dilog(-I*a*x + 1) + 2*a*c*x +
2*(a^2*c*x^2 + c)*arctan(a*x))/x^2
```

mupad [B] time = 0.56, size = 71, normalized size = 1.01

$$\begin{cases} 0 & \text{if } a=0 \\ -\frac{c\,\mathrm{atan}(a\,x)}{2\,x^2}-\frac{c\left(a^3\,\mathrm{atan}(a\,x)+\frac{a^2}{x}\right)}{2\,a}-\frac{a^2\,c\,\mathrm{Li}_2(1-a\,x\,1\mathrm{i})\,1\mathrm{i}}{2}+\frac{a^2\,c\,\mathrm{Li}_2(1+a\,x\,1\mathrm{i})\,1\mathrm{i}}{2} & \text{if } a\neq 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2))/x^3,x)
```

```
[Out] piecewise(a == 0, 0, a ~= 0, - (c*atan(a*x))/(2*x^2) - (a^2*c*dilog(- a*x*1
i + 1)*1i)/2 + (a^2*c*dilog(a*x*1i + 1)*1i)/2 - (c*(a^3*atan(a*x) + a^2/x))
/(2*a))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int\frac{\mathrm{atan}\left(ax\right)}{x^3}\,dx+\int\frac{a^2\,\mathrm{atan}\left(ax\right)}{x}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)/x**3,x)
```

```
[Out] c*(Integral(atan(a*x)/x**3, x) + Integral(a**2*atan(a*x)/x, x))
```

3.156 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)}{x^4}\,dx$

Optimal. Leaf size=63

$$\frac{2}{3}a^3c\log(x) - \frac{a^2c\tan^{-1}(ax)}{x} - \frac{1}{3}a^3c\log\left(a^2x^2+1\right) - \frac{c\tan^{-1}(ax)}{3x^3} - \frac{ac}{6x^2}$$

```
[Out] -1/6*a*c/x^2-1/3*c*arctan(a*x)/x^3-a^2*c*arctan(a*x)/x+2/3*a^3*c*ln(x)-1/3*
a^3*c*ln(a^2*x^2+1)
```

Rubi [A] time = 0.08, antiderivative size = 63, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.389, Rules used = {4950, 4852, 266, 44, 36, 29, 31}

$$-\frac{1}{3}a^3c\log\left(a^2x^2+1\right) + \frac{2}{3}a^3c\log(x) - \frac{a^2c\tan^{-1}(ax)}{x} - \frac{ac}{6x^2} - \frac{c\tan^{-1}(ax)}{3x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x])/x^4,x]
```

```
[Out] -(a*c)/(6*x^2) - (c*ArcTan[a*x])/(3*x^3) - (a^2*c*ArcTan[a*x])/x + (2*a^3*c
*Log[x])/3 - (a^3*c*Log[1 + a^2*x^2])/3
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)}{x^4}\,dx &= c\int \frac{\tan^{-1}(ax)}{x^4}\,dx+\left(a^2c\right)\int \frac{\tan^{-1}(ax)}{x^2}\,dx\\
&= -\frac{c\tan^{-1}(ax)}{3x^3}-\frac{a^2c\tan^{-1}(ax)}{x}+\frac{1}{3}(ac)\int \frac{1}{x^3\left(1+a^2x^2\right)}\,dx+\left(a^3c\right)\int \frac{1}{x\left(1+a^2x\right.}\\
&= -\frac{c\tan^{-1}(ax)}{3x^3}-\frac{a^2c\tan^{-1}(ax)}{x}+\frac{1}{6}(ac)\,\mathrm{Subst}\left(\int \frac{1}{x^2\left(1+a^2x\right)}\,dx,x,x^2\right)+\frac{1}{2}\left(a^3\right.\\
&= -\frac{c\tan^{-1}(ax)}{3x^3}-\frac{a^2c\tan^{-1}(ax)}{x}+\frac{1}{6}(ac)\,\mathrm{Subst}\left(\int \left(\frac{1}{x^2}-\frac{a^2}{x}+\frac{a^4}{1+a^2x}\right)dx,x,x^2\right.\\
&= -\frac{ac}{6x^2}-\frac{c\tan^{-1}(ax)}{3x^3}-\frac{a^2c\tan^{-1}(ax)}{x}+\frac{2}{3}a^3c\log(x)-\frac{1}{3}a^3c\log\left(1+a^2x^2\right)
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 58, normalized size = 0.92

$$
\frac{c\left(ax\left(4a^2x^2\log(x)-2a^2x^2\log\left(a^2x^2+1\right)-1\right)-2\left(3a^2x^2+1\right)\tan^{-1}(ax)\right)}{6x^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x])/x^4,x]
```

```
[Out] (c*(-2*(1 + 3*a^2*x^2)*ArcTan[a*x] + a*x*(-1 + 4*a^2*x^2*Log[x] - 2*a^2*x^2
*Log[1 + a^2*x^2])))/(6*x^3)
```

fricas [A] time = 0.50, size = 57, normalized size = 0.90

$$
-\frac{2\,a^3cx^3\log\left(a^2x^2+1\right)-4\,a^3cx^3\log(x)+acx+2\left(3\,a^2cx^2+c\right)\arctan\left(ax\right)}{6\,x^3}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^4,x, algorithm="fricas")
```

```
[Out] -1/6*(2*a^3*c*x^3*log(a^2*x^2 + 1) - 4*a^3*c*x^3*log(x) + a*c*x + 2*(3*a^2*
c*x^2 + c)*arctan(a*x))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$
sage_0x
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 58, normalized size = 0.92

$$-\frac{c\arctan(ax)}{3x^3}-\frac{a^2c\arctan(ax)}{x}-\frac{ac}{6x^2}+\frac{2a^3c\ln(ax)}{3}-\frac{a^3c\ln\left(a^2x^2+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)/x^4,x)
```

```
[Out] -1/3*c*arctan(a*x)/x^3-a^2*c*arctan(a*x)/x-1/6*a*c/x^2+2/3*a^3*c*ln(a*x)-1/
3*a^3*c*ln(a^2*x^2+1)
```

maxima [A] time = 0.32, size = 56, normalized size = 0.89

$$-\frac{1}{6}\left(2\,a^2c\log\left(a^2x^2+1\right)-2\,a^2c\log\left(x^2\right)+\frac{c}{x^2}\right)a-\frac{\left(3\,a^2cx^2+c\right)\arctan(ax)}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*(2*a^2*c*log(a^2*x^2 + 1) - 2*a^2*c*log(x^2) + c/x^2)*a - 1/3*(3*a^2*c
*x^2 + c)*arctan(a*x)/x^3
```

mupad [B] time = 0.15, size = 57, normalized size = 0.90

$$\frac{c\,\left(4\,a^3\,\ln(x)-2\,a^3\,\ln\left(a^2\,x^2+1\right)\right)}{6}-\frac{\frac{c\,\mathrm{atan}(a\,x)}{3}+\frac{a\,c\,x}{6}+a^2\,c\,x^2\,\mathrm{atan}\left(a\,x\right)}{x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2))/x^4,x)
```

```
[Out] (c*(4*a^3*log(x) - 2*a^3*log(a^2*x^2 + 1)))/6 - ((c*atan(a*x))/3 + (a*c*x)/
6 + a^2*c*x^2*atan(a*x))/x^3
```

sympy [A] time = 1.11, size = 61, normalized size = 0.97

$$\begin{cases} \frac{2a^3c\log(x)}{3}-\frac{a^3c\log\left(x^2+\frac{1}{a^2}\right)}{3}-\frac{a^2c\,\mathrm{atan}(ax)}{x}-\frac{ac}{6x^2}-\frac{c\,\mathrm{atan}(ax)}{3x^3} & \text{for } a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)/x**4,x)
```

```
[Out] Piecewise((2*a**3*c*log(x)/3 - a**3*c*log(x**2 + a**(-2))/3 - a**2*c*atan(a
*x)/x - a*c/(6*x**2) - c*atan(a*x)/(3*x**3), Ne(a, 0)), (0, True))
```

3.157 $\int x^3 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)\,dx$

Optimal. Leaf size=111

$$\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)-\frac{c^2\tan^{-1}(ax)}{24a^4}-\frac{1}{56}a^3c^2x^7+\frac{c^2x}{24a^3}+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)-\frac{1}{24}ac^2x^5+\frac{1}{4}c^2x^4\tan^{-1}(ax)-\frac{c^2x^3}{72a}$$

```
[Out] 1/24*c^2*x/a^3-1/72*c^2*x^3/a-1/24*a*c^2*x^5-1/56*a^3*c^2*x^7-1/24*c^2*arct
an(a*x)/a^4+1/4*c^2*x^4*arctan(a*x)+1/3*a^2*c^2*x^6*arctan(a*x)+1/8*a^4*c^2
*x^8*arctan(a*x)
```

Rubi [A] time = 0.16, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4948, 4852, 302, 203}

$$-\frac{1}{56}a^3c^2x^7+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)+\frac{c^2x}{24a^3}-\frac{c^2\tan^{-1}(ax)}{24a^4}-\frac{1}{24}ac^2x^5-\frac{c^2x^3}{72a}+\frac{1}{4}c^2x^4\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] (c^2*x)/(24*a^3) - (c^2*x^3)/(72*a) - (a*c^2*x^5)/24 - (a^3*c^2*x^7)/56 - (
c^2*ArcTan[a*x])/(24*a^4) + (c^2*x^4*ArcTan[a*x])/4 + (a^2*c^2*x^6*ArcTan[a
*x])/3 + (a^4*c^2*x^8*ArcTan[a*x])/8
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^3 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)\,dx = \int \left(c^2x^3\tan^{-1}(ax)+2a^2c^2x^5\tan^{-1}(ax)+a^4c^2x^7\tan^{-1}(ax)\right)dx$$
$$= c^2\int x^3\tan^{-1}(ax)\,dx+\left(2a^2c^2\right)\int x^5\tan^{-1}(ax)\,dx+\left(a^4c^2\right)\int x^7\tan^{-1}(ax)\,dx$$
$$= \frac{1}{4}c^2x^4\tan^{-1}(ax)+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)-\frac{1}{4}\left(ac^2\right)\int \frac{x^4}{1+a^2x$$
$$= \frac{1}{4}c^2x^4\tan^{-1}(ax)+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)-\frac{1}{4}\left(ac^2\right)\int\left(-\frac{1}{a^4}+$$
$$= \frac{c^2x}{24a^3}-\frac{c^2x^3}{72a}-\frac{1}{24}ac^2x^5-\frac{1}{56}a^3c^2x^7+\frac{1}{4}c^2x^4\tan^{-1}(ax)+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)+$$
$$= \frac{c^2x}{24a^3}-\frac{c^2x^3}{72a}-\frac{1}{24}ac^2x^5-\frac{1}{56}a^3c^2x^7-\frac{c^2\tan^{-1}(ax)}{24a^4}+\frac{1}{4}c^2x^4\tan^{-1}(ax)+\frac{1}{3}a^2c^2$$

Mathematica [A] time = 0.09, size = 111, normalized size = 1.00

$$\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)-\frac{c^2\tan^{-1}(ax)}{24a^4}-\frac{1}{56}a^3c^2x^7+\frac{c^2x}{24a^3}+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)-\frac{1}{24}ac^2x^5+\frac{1}{4}c^2x^4\tan^{-1}(ax)-\frac{c^2x^3}{72a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] (c^2*x)/(24*a^3) - (c^2*x^3)/(72*a) - (a*c^2*x^5)/24 - (a^3*c^2*x^7)/56 - (
c^2*ArcTan[a*x])/(24*a^4) + (c^2*x^4*ArcTan[a*x])/4 + (a^2*c^2*x^6*ArcTan[a
*x])/3 + (a^4*c^2*x^8*ArcTan[a*x])/8
```

fricas [A] time = 0.47, size = 91, normalized size = 0.82

$$-\frac{9\,a^7c^2x^7+21\,a^5c^2x^5+7\,a^3c^2x^3-21\,ac^2x-21\left(3\,a^8c^2x^8+8\,a^6c^2x^6+6\,a^4c^2x^4-c^2\right)\arctan(ax)}{504\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/504*(9*a^7*c^2*x^7 + 21*a^5*c^2*x^5 + 7*a^3*c^2*x^3 - 21*a*c^2*x - 21*(3
*a^8*c^2*x^8 + 8*a^6*c^2*x^6 + 6*a^4*c^2*x^4 - c^2)*arctan(a*x))/a^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 96, normalized size = 0.86

$$\frac{c^2x}{24a^3}-\frac{c^2x^3}{72a}-\frac{a\,c^2x^5}{24}-\frac{a^3c^2x^7}{56}-\frac{c^2\arctan(ax)}{24a^4}+\frac{c^2x^4\arctan(ax)}{4}+\frac{a^2c^2x^6\arctan(ax)}{3}+\frac{a^4c^2x^8\arctan(ax)}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^2*arctan(a*x),x)
```

```
[Out] 1/24*c^2*x/a^3-1/72*c^2*x^3/a-1/24*a*c^2*x^5-1/56*a^3*c^2*x^7-1/24*c^2*arct
an(a*x)/a^4+1/4*c^2*x^4*arctan(a*x)+1/3*a^2*c^2*x^6*arctan(a*x)+1/8*a^4*c^2
*x^8*arctan(a*x)
```

maxima [A] time = 0.44, size = 98, normalized size = 0.88

$$-\frac{1}{504}\,a\left(\frac{21\,c^2\arctan\left(ax\right)}{a^5}+\frac{9\,a^6c^2x^7+21\,a^4c^2x^5+7\,a^2c^2x^3-21\,c^2x}{a^4}\right)+\frac{1}{24}\left(3\,a^4c^2x^8+8\,a^2c^2x^6+6\,c^2x^4\right)\mathrm{arcta}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/504*a*(21*c^2*arctan(a*x)/a^5 + (9*a^6*c^2*x^7 + 21*a^4*c^2*x^5 + 7*a^2*
c^2*x^3 - 21*c^2*x)/a^4) + 1/24*(3*a^4*c^2*x^8 + 8*a^2*c^2*x^6 + 6*c^2*x^4)
*arctan(a*x)
```

mupad [B] time = 0.42, size = 89, normalized size = 0.80

$$\mathrm{atan}\left(a\,x\right)\,\left(\frac{a^4\,c^2\,x^8}{8}+\frac{a^2\,c^2\,x^6}{3}+\frac{c^2\,x^4}{4}\right)+\frac{c^2\,x}{24\,a^3}-\frac{a\,c^2\,x^5}{24}-\frac{c^2\,\mathrm{atan}\left(a\,x\right)}{24\,a^4}-\frac{c^2\,x^3}{72\,a}-\frac{a^3\,c^2\,x^7}{56}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)*(c + a^2*c*x^2)^2,x)
```

```
[Out] atan(a*x)*((c^2*x^4)/4 + (a^2*c^2*x^6)/3 + (a^4*c^2*x^8)/8) + (c^2*x)/(24*a
^3) - (a*c^2*x^5)/24 - (c^2*atan(a*x))/(24*a^4) - (c^2*x^3)/(72*a) - (a^3*c
^2*x^7)/56
```

sympy [A] time = 2.50, size = 104, normalized size = 0.94

$$\begin{cases} \frac{a^{4} c^{2} x^{8} \operatorname{atan}{\left(a x \right)}}{8} - \frac{a^{3} c^{2} x^{7}}{56} + \frac{a^{2} c^{2} x^{6} \operatorname{atan}{\left(a x \right)}}{3} - \frac{a c^{2} x^{5}}{24} + \frac{c^{2} x^{4} \operatorname{atan}{\left(a x \right)}}{4} - \frac{c^{2} x^{3}}{72 a} + \frac{c^{2} x}{24 a^{3}} - \frac{c^{2} \operatorname{atan}{\left(a x \right)}}{24 a^{4}} & \text{for}\: a \neq 0 \\0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**2*atan(a*x),x)
```

```
[Out] Piecewise((a**4*c**2*x**8*atan(a*x)/8 - a**3*c**2*x**7/56 + a**2*c**2*x**6*
atan(a*x)/3 - a*c**2*x**5/24 + c**2*x**4*atan(a*x)/4 - c**2*x**3/(72*a) + c
**2*x/(24*a**3) - c**2*atan(a*x)/(24*a**4), Ne(a, 0)), (0, True))
```

3.158 $\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x) \, dx$

Optimal. Leaf size=106

$$\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)-\frac{1}{42}a^3c^2x^6+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)+\frac{4c^2\log\left(a^2x^2+1\right)}{105a^3}-\frac{9}{140}ac^2x^4+\frac{1}{3}c^2x^3\tan^{-1}(ax)-\frac{4c^2x^2}{105a}$$

```
[Out] -4/105*c^2*x^2/a-9/140*a*c^2*x^4-1/42*a^3*c^2*x^6+1/3*c^2*x^3*arctan(a*x)+2
/5*a^2*c^2*x^5*arctan(a*x)+1/7*a^4*c^2*x^7*arctan(a*x)+4/105*c^2*ln(a^2*x^2
+1)/a^3
```

Rubi [A] time = 0.17, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4948, 4852, 266, 43}

$$-\frac{1}{42}a^3c^2x^6+\frac{4c^2\log\left(a^2x^2+1\right)}{105a^3}+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)-\frac{9}{140}ac^2x^4-\frac{4c^2x^2}{105a}+\frac{1}{3}c^2x^3\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] (-4*c^2*x^2)/(105*a) - (9*a*c^2*x^4)/140 - (a^3*c^2*x^6)/42 + (c^2*x^3*ArcT
an[a*x])/3 + (2*a^2*c^2*x^5*ArcTan[a*x])/5 + (a^4*c^2*x^7*ArcTan[a*x])/7 +
(4*c^2*Log[1 + a^2*x^2])/(105*a^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^2 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)\,dx = \int \left(c^2x^2\tan^{-1}(ax)+2a^2c^2x^4\tan^{-1}(ax)+a^4c^2x^6\tan^{-1}(ax)\right)dx$$
$$= c^2\int x^2\tan^{-1}(ax)\,dx+\left(2a^2c^2\right)\int x^4\tan^{-1}(ax)\,dx+\left(a^4c^2\right)\int x^6\tan^{-1}(ax)\,d$$
$$= \frac{1}{3}c^2x^3\tan^{-1}(ax)+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)-\frac{1}{3}\left(ac^2\right)\int \frac{x}{1+}$$
$$= \frac{1}{3}c^2x^3\tan^{-1}(ax)+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)-\frac{1}{6}\left(ac^2\right)\text{Subst}$$
$$= \frac{1}{3}c^2x^3\tan^{-1}(ax)+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)-\frac{1}{6}\left(ac^2\right)\text{Subst}$$
$$= -\frac{4c^2x^2}{105a}-\frac{9}{140}ac^2x^4-\frac{1}{42}a^3c^2x^6+\frac{1}{3}c^2x^3\tan^{-1}(ax)+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)+\frac{1}{7}$$

Mathematica [A] time = 0.06, size = 106, normalized size = 1.00

$$\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)-\frac{1}{42}a^3c^2x^6+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)+\frac{4c^2\log\left(a^2x^2+1\right)}{105a^3}-\frac{9}{140}ac^2x^4+\frac{1}{3}c^2x^3\tan^{-1}(ax)-\frac{4c^2x^2}{105a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] (-4*c^2*x^2)/(105*a) - (9*a*c^2*x^4)/140 - (a^3*c^2*x^6)/42 + (c^2*x^3*ArcT
an[a*x])/3 + (2*a^2*c^2*x^5*ArcTan[a*x])/5 + (a^4*c^2*x^7*ArcTan[a*x])/7 +
(4*c^2*Log[1 + a^2*x^2])/(105*a^3)
```

fricas [A] time = 0.44, size = 94, normalized size = 0.89

$$-\frac{10\,a^6c^2x^6+27\,a^4c^2x^4+16\,a^2c^2x^2-16\,c^2\log\left(a^2x^2+1\right)-4\left(15\,a^7c^2x^7+42\,a^5c^2x^5+35\,a^3c^2x^3\right)\arctan\left(ax\right)}{420\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/420*(10*a^6*c^2*x^6 + 27*a^4*c^2*x^4 + 16*a^2*c^2*x^2 - 16*c^2*log(a^2*x
^2 + 1) - 4*(15*a^7*c^2*x^7 + 42*a^5*c^2*x^5 + 35*a^3*c^2*x^3)*arctan(a*x))
/a^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 93, normalized size = 0.88

$$-\frac{4c^2x^2}{105a}-\frac{9a\,c^2x^4}{140}-\frac{a^3c^2x^6}{42}+\frac{c^2x^3\arctan\left(ax\right)}{3}+\frac{2a^2c^2x^5\arctan\left(ax\right)}{5}+\frac{a^4c^2x^7\arctan\left(ax\right)}{7}+\frac{4c^2\ln\left(a^2x^2+1\right)}{105a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^2*arctan(a*x),x)
```

```
[Out] -4/105*c^2*x^2/a-9/140*a*c^2*x^4-1/42*a^3*c^2*x^6+1/3*c^2*x^3*arctan(a*x)+2
/5*a^2*c^2*x^5*arctan(a*x)+1/7*a^4*c^2*x^7*arctan(a*x)+4/105*c^2*ln(a^2*x^2
+1)/a^3
```

maxima [A] time = 0.33, size = 95, normalized size = 0.90

$$-\frac{1}{420}a\left(\frac{10a^4c^2x^6+27a^2c^2x^4+16c^2x^2}{a^2}-\frac{16c^2\log\left(a^2x^2+1\right)}{a^4}\right)+\frac{1}{105}\left(15a^4c^2x^7+42a^2c^2x^5+35c^2x^3\right)\arctan\left(a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/420*a*((10*a^4*c^2*x^6 + 27*a^2*c^2*x^4 + 16*c^2*x^2)/a^2 - 16*c^2*log(a
^2*x^2 + 1)/a^4) + 1/105*(15*a^4*c^2*x^7 + 42*a^2*c^2*x^5 + 35*c^2*x^3)*arc
tan(a*x)
```

mupad [B] time = 0.54, size = 81, normalized size = 0.76

$$\frac{c^2\left(16\ln\left(a^2x^2+1\right)-16a^2x^2-27a^4x^4-10a^6x^6+140a^3x^3\operatorname{atan}(ax)+168a^5x^5\operatorname{atan}(ax)+60a^7x^7\operatorname{atan}(a\right.}{420a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)*(c + a^2*c*x^2)^2,x)
```

```
[Out] (c^2*(16*log(a^2*x^2 + 1) - 16*a^2*x^2 - 27*a^4*x^4 - 10*a^6*x^6 + 140*a^3*
x^3*atan(a*x) + 168*a^5*x^5*atan(a*x) + 60*a^7*x^7*atan(a*x)))/(420*a^3)
```

sympy [A] time = 1.83, size = 105, normalized size = 0.99

$$\begin{cases}\frac{a^4c^2x^7\operatorname{atan}(ax)}{7}-\frac{a^3c^2x^6}{42}+\frac{2a^2c^2x^5\operatorname{atan}(ax)}{5}-\frac{9ac^2x^4}{140}+\frac{c^2x^3\operatorname{atan}(ax)}{3}-\frac{4c^2x^2}{105a}+\frac{4c^2\log\left(x^2+\frac{1}{a^2}\right)}{105a^3} & \text{for } a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**2*atan(a*x),x)
```

```
[Out] Piecewise((a**4*c**2*x**7*atan(a*x)/7 - a**3*c**2*x**6/42 + 2*a**2*c**2*x**
5*atan(a*x)/5 - 9*a*c**2*x**4/140 + c**2*x**3*atan(a*x)/3 - 4*c**2*x**2/(10
5*a) + 4*c**2*log(x**2 + a**(-2))/(105*a**3), Ne(a, 0)), (0, True))
```

3.159 $\int x \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)\, dx$

Optimal. Leaf size=61

$$-\frac{1}{30} a^3 c^2 x^5+\frac{c^2 \left(a^2 x^2+1\right)^3 \tan^{-1}(ax)}{6 a^2}-\frac{1}{9} a c^2 x^3-\frac{c^2 x}{6 a}$$

```
[Out] -1/6*c^2*x/a-1/9*a*c^2*x^3-1/30*a^3*c^2*x^5+1/6*c^2*(a^2*x^2+1)^3*arctan(a*
x)/a^2
```

Rubi [A] time = 0.04, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4930, 194}

$$-\frac{1}{30} a^3 c^2 x^5+\frac{c^2 \left(a^2 x^2+1\right)^3 \tan^{-1}(ax)}{6 a^2}-\frac{1}{9} a c^2 x^3-\frac{c^2 x}{6 a}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] -(c^2*x)/(6*a) - (a*c^2*x^3)/9 - (a^3*c^2*x^5)/30 + (c^2*(1 + a^2*x^2)^3*Ar
cTan[a*x])/(6*a^2)
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int x \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)\, dx &= \frac{c^2 \left(1+a^2 x^2\right)^3 \tan^{-1}(ax)}{6 a^2}-\frac{\int \left(c+a^2 c x^2\right)^2 \, dx}{6 a}\\
&= \frac{c^2 \left(1+a^2 x^2\right)^3 \tan^{-1}(ax)}{6 a^2}-\frac{\int \left(c^2+2 a^2 c^2 x^2+a^4 c^2 x^4\right) \, dx}{6 a}\\
&= -\frac{c^2 x}{6 a}-\frac{1}{9} a c^2 x^3-\frac{1}{30} a^3 c^2 x^5+\frac{c^2 \left(1+a^2 x^2\right)^3 \tan^{-1}(ax)}{6 a^2}
\end{aligned}$$

Mathematica [A] time = 0.05, size = 98, normalized size = 1.61

$$\frac{1}{6} a^4 c^2 x^6 \tan^{-1}(ax)-\frac{1}{30} a^3 c^2 x^5+\frac{1}{2} a^2 c^2 x^4 \tan^{-1}(ax)+\frac{c^2 \tan^{-1}(ax)}{6 a^2}-\frac{1}{9} a c^2 x^3+\frac{1}{2} c^2 x^2 \tan^{-1}(ax)-\frac{c^2 x}{6 a}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] -1/6*(c^2*x)/a - (a*c^2*x^3)/9 - (a^3*c^2*x^5)/30 + (c^2*ArcTan[a*x])/(6*a^
2) + (c^2*x^2*ArcTan[a*x])/2 + (a^2*c^2*x^4*ArcTan[a*x])/2 + (a^4*c^2*x^6*A
rcTan[a*x])/6
```

fricas [A] time = 0.47, size = 77, normalized size = 1.26

$$-\frac{3\,a^5c^2x^5+10\,a^3c^2x^3+15\,ac^2x-15\left(a^6c^2x^6+3\,a^4c^2x^4+3\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)}{90\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/90*(3*a^5*c^2*x^5 + 10*a^3*c^2*x^3 + 15*a*c^2*x - 15*(a^6*c^2*x^6 + 3*a^
4*c^2*x^4 + 3*a^2*c^2*x^2 + c^2)*arctan(a*x))/a^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 85, normalized size = 1.39

$$\frac{a^4c^2\arctan\left(ax\right)x^6}{6}+\frac{a^2c^2\arctan\left(ax\right)x^4}{2}+\frac{c^2\arctan\left(ax\right)x^2}{2}-\frac{a^3c^2x^5}{30}-\frac{a\,c^2x^3}{9}-\frac{c^2x}{6a}+\frac{c^2\arctan\left(ax\right)}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2*arctan(a*x),x)
```

```
[Out] 1/6*a^4*c^2*arctan(a*x)*x^6+1/2*a^2*c^2*arctan(a*x)*x^4+1/2*c^2*arctan(a*x)
*x^2-1/30*a^3*c^2*x^5-1/9*a*c^2*x^3-1/6*c^2*x/a+1/6/a^2*c^2*arctan(a*x)
```

maxima [A] time = 0.32, size = 62, normalized size = 1.02

$$\frac{\left(a^2cx^2+c\right)^3\arctan\left(ax\right)}{6\,a^2c}-\frac{3\,a^4c^3x^5+10\,a^2c^3x^3+15\,c^3x}{90\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="maxima")
```

```
[Out] 1/6*(a^2*c*x^2 + c)^3*arctan(a*x)/(a^2*c) - 1/90*(3*a^4*c^3*x^5 + 10*a^2*c^
3*x^3 + 15*c^3*x)/(a*c)
```

mupad [B] time = 0.55, size = 71, normalized size = 1.16

$$\frac{c^2\,\left(15\,\mathrm{atan}\left(a\,x\right)-15\,a\,x-10\,a^3\,x^3-3\,a^5\,x^5+45\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)+45\,a^4\,x^4\,\mathrm{atan}\left(a\,x\right)+15\,a^6\,x^6\,\mathrm{atan}\left(a\,x\right)\right)}{90\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)*(c + a^2*c*x^2)^2,x)
```

```
[Out] (c^2*(15*atan(a*x) - 15*a*x - 10*a^3*x^3 - 3*a^5*x^5 + 45*a^2*x^2*atan(a*x)
 + 45*a^4*x^4*atan(a*x) + 15*a^6*x^6*atan(a*x)))/(90*a^2)
```

sympy [A] time = 1.51, size = 92, normalized size = 1.51

$$\begin{cases} \frac{a^4c^2x^6\operatorname{atan}(ax)}{6} - \frac{a^3c^2x^5}{30} + \frac{a^2c^2x^4\operatorname{atan}(ax)}{2} - \frac{ac^2x^3}{9} + \frac{c^2x^2\operatorname{atan}(ax)}{2} - \frac{c^2x}{6a} + \frac{c^2\operatorname{atan}(ax)}{6a^2} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2*atan(a*x),x)
```

```
[Out] Piecewise((a**4*c**2*x**6*atan(a*x)/6 - a**3*c**2*x**5/30 + a**2*c**2*x**4*
atan(a*x)/2 - a*c**2*x**3/9 + c**2*x**2*atan(a*x)/2 - c**2*x/(6*a) + c**2*a
tan(a*x)/(6*a**2), Ne(a, 0)), (0, True))
```

3.160 $\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)\,dx$

Optimal. Leaf size=117

$$-\frac{c^2\left(a^2x^2+1\right)^2}{20a}-\frac{2c^2\left(a^2x^2+1\right)}{15a}-\frac{4c^2\log\left(a^2x^2+1\right)}{15a}+\frac{1}{5}c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)+\frac{4}{15}c^2x\left(a^2x^2+1\right)\tan^{-1}(ax)+\frac{8}{15}$$

```
[Out] -2/15*c^2*(a^2*x^2+1)/a-1/20*c^2*(a^2*x^2+1)^2/a+8/15*c^2*x*arctan(a*x)+4/1
5*c^2*x*(a^2*x^2+1)*arctan(a*x)+1/5*c^2*x*(a^2*x^2+1)^2*arctan(a*x)-4/15*c^
2*ln(a^2*x^2+1)/a
```

Rubi [A] time = 0.05, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {4878, 4846, 260}

$$-\frac{c^2\left(a^2x^2+1\right)^2}{20a}-\frac{2c^2\left(a^2x^2+1\right)}{15a}-\frac{4c^2\log\left(a^2x^2+1\right)}{15a}+\frac{1}{5}c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)+\frac{4}{15}c^2x\left(a^2x^2+1\right)\tan^{-1}(ax)+\frac{8}{15}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] (-2*c^2*(1 + a^2*x^2))/(15*a) - (c^2*(1 + a^2*x^2)^2)/(20*a) + (8*c^2*x*Arc
Tan[a*x])/15 + (4*c^2*x*(1 + a^2*x^2)*ArcTan[a*x])/15 + (c^2*x*(1 + a^2*x^2
)^2*ArcTan[a*x])/5 - (4*c^2*Log[1 + a^2*x^2])/(15*a)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^2\tan^{-1}(ax)\,dx &= -\frac{c^2\left(1+a^2x^2\right)^2}{20a}+\frac{1}{5}c^2x\left(1+a^2x^2\right)^2\tan^{-1}(ax)+\frac{1}{5}(4c)\int\left(c+a^2cx^2\right)\tan^{-1}(ax)\,dx\\ &= -\frac{2c^2\left(1+a^2x^2\right)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2}{20a}+\frac{4}{15}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax)+\frac{1}{5}c^2x\left(1+a^2x^2\right)^2\\ &= -\frac{2c^2\left(1+a^2x^2\right)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2}{20a}+\frac{8}{15}c^2x\tan^{-1}(ax)+\frac{4}{15}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax)\\ &= -\frac{2c^2\left(1+a^2x^2\right)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2}{20a}+\frac{8}{15}c^2x\tan^{-1}(ax)+\frac{4}{15}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax)\end{aligned}$$

Mathematica [A] time = 0.06, size = 65, normalized size = 0.56

$$\frac{c^2\left(-3a^4x^4-14a^2x^2-16\log\left(a^2x^2+1\right)+4ax\left(3a^4x^4+10a^2x^2+15\right)\tan^{-1}(ax)\right)}{60a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] (c^2*(-14*a^2*x^2 - 3*a^4*x^4 + 4*a*x*(15 + 10*a^2*x^2 + 3*a^4*x^4)*ArcTan[
a*x] - 16*Log[1 + a^2*x^2]))/(60*a)
```

fricas [A] time = 0.48, size = 79, normalized size = 0.68

$$-\frac{3\,a^4c^2x^4+14\,a^2c^2x^2+16\,c^2\log\left(a^2x^2+1\right)-4\left(3\,a^5c^2x^5+10\,a^3c^2x^3+15\,ac^2x\right)\arctan\left(ax\right)}{60\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/60*(3*a^4*c^2*x^4 + 14*a^2*c^2*x^2 + 16*c^2*log(a^2*x^2 + 1) - 4*(3*a^5*
c^2*x^5 + 10*a^3*c^2*x^3 + 15*a*c^2*x)*arctan(a*x))/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 79, normalized size = 0.68

$$\frac{a^4c^2\arctan\left(ax\right)x^5}{5}+\frac{2a^2c^2\arctan\left(ax\right)x^3}{3}+c^2x\arctan\left(ax\right)-\frac{a^3c^2x^4}{20}-\frac{7c^2x^2a}{30}-\frac{4c^2\ln\left(a^2x^2+1\right)}{15a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x),x)
```

```
[Out] 1/5*a^4*c^2*arctan(a*x)*x^5+2/3*a^2*c^2*arctan(a*x)*x^3+c^2*x*arctan(a*x)-1
/20*a^3*c^2*x^4-7/30*c^2*x^2*a-4/15*c^2*ln(a^2*x^2+1)/a
```

maxima [A] time = 0.32, size = 77, normalized size = 0.66

$$-\frac{1}{60}\left(3\,a^2c^2x^4+14\,c^2x^2+\frac{16\,c^2\log\left(a^2x^2+1\right)}{a^2}\right)a+\frac{1}{15}\left(3\,a^4c^2x^5+10\,a^2c^2x^3+15\,c^2x\right)\arctan\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/60*(3*a^2*c^2*x^4 + 14*c^2*x^2 + 16*c^2*log(a^2*x^2 + 1)/a^2)*a + 1/15*(
3*a^4*c^2*x^5 + 10*a^2*c^2*x^3 + 15*c^2*x)*arctan(a*x)
```

mupad [B] time = 0.20, size = 69, normalized size = 0.59

$$-\frac{c^2\,\left(16\,\ln\left(a^2\,x^2+1\right)+14\,a^2\,x^2+3\,a^4\,x^4-40\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right)-12\,a^5\,x^5\,\mathrm{atan}\left(a\,x\right)-60\,a\,x\,\mathrm{atan}\left(a\,x\right)\right)}{60\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)*(c + a^2*c*x^2)^2,x)
```

```
[Out] -(c^2*(16*log(a^2*x^2 + 1) + 14*a^2*x^2 + 3*a^4*x^4 - 40*a^3*x^3*atan(a*x)
- 12*a^5*x^5*atan(a*x) - 60*a*x*atan(a*x)))/(60*a)
```

sympy [A] time = 1.14, size = 88, normalized size = 0.75

$$\begin{cases} \frac{a^4c^2x^5 \operatorname{atan}(ax)}{5} - \frac{a^3c^2x^4}{20} + \frac{2a^2c^2x^3 \operatorname{atan}(ax)}{3} - \frac{7ac^2x^2}{30} + c^2x \operatorname{atan}(ax) - \frac{4c^2 \log\left(x^2+\frac{1}{a^2}\right)}{15a} & \text{for } a \neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x),x)
```

```
[Out] Piecewise((a**4*c**2*x**5*atan(a*x)/5 - a**3*c**2*x**4/20 + 2*a**2*c**2*x**
3*atan(a*x)/3 - 7*a*c**2*x**2/30 + c**2*x*atan(a*x) - 4*c**2*log(x**2 + a**
(-2))/(15*a), Ne(a, 0)), (0, True))
```

3.161 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)}{x} dx$

Optimal. Leaf size=99

$$\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)-\frac{1}{12}a^3c^2x^3+a^2c^2x^2\tan^{-1}(ax)+\frac{1}{2}ic^2\text{Li}_2(-iax)-\frac{1}{2}ic^2\text{Li}_2(iax)-\frac{3}{4}ac^2x+\frac{3}{4}c^2\tan^{-1}(ax)$$

```
[Out] -3/4*a*c^2*x-1/12*a^3*c^2*x^3+3/4*c^2*arctan(a*x)+a^2*c^2*x^2*arctan(a*x)+1
/4*a^4*c^2*x^4*arctan(a*x)+1/2*I*c^2*polylog(2,-I*a*x)-1/2*I*c^2*polylog(2,
I*a*x)
```

Rubi [A] time = 0.12, antiderivative size = 99, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4948, 4848, 2391, 4852, 321, 203, 302}

$$\frac{1}{2}ic^2\text{PolyLog}(2,-iax)-\frac{1}{2}ic^2\text{PolyLog}(2,iax)-\frac{1}{12}a^3c^2x^3+\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)+a^2c^2x^2\tan^{-1}(ax)-\frac{3}{4}ac^2x+\frac{3}{4}c^2\tan$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x])/x,x]
```

```
[Out] (-3*a*c^2*x)/4 - (a^3*c^2*x^3)/12 + (3*c^2*ArcTan[a*x])/4 + a^2*c^2*x^2*Arc
Tan[a*x] + (a^4*c^2*x^4*ArcTan[a*x])/4 + (I/2)*c^2*PolyLog[2, (-I)*a*x] - (
I/2)*c^2*PolyLog[2, I*a*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
```

```
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)}{x}\,dx &= \int \left(\frac{c^2\tan^{-1}(ax)}{x}+2a^2c^2x\tan^{-1}(ax)+a^4c^2x^3\tan^{-1}(ax)\right)dx\\
&= c^2\int \frac{\tan^{-1}(ax)}{x}\,dx+\left(2a^2c^2\right)\int x\tan^{-1}(ax)\,dx+\left(a^4c^2\right)\int x^3\tan^{-1}(ax)\,dx\\
&= a^2c^2x^2\tan^{-1}(ax)+\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)+\frac{1}{2}\left(ic^2\right)\int \frac{\log(1-iax)}{x}\,dx-\frac{1}{2}\left(ic^2\right)\int \frac{\text{lo}
\end{aligned}
$$

$$
\begin{aligned}
&= -ac^2x+a^2c^2x^2\tan^{-1}(ax)+\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)+\frac{1}{2}ic^2\text{Li}_2(-iax)-\frac{1}{2}ic^2\text{Li}_2(iax)+\\
&= -\frac{3}{4}ac^2x-\frac{1}{12}a^3c^2x^3+c^2\tan^{-1}(ax)+a^2c^2x^2\tan^{-1}(ax)+\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)+\frac{1}{2}ic\\
&= -\frac{3}{4}ac^2x-\frac{1}{12}a^3c^2x^3+\frac{3}{4}c^2\tan^{-1}(ax)+a^2c^2x^2\tan^{-1}(ax)+\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)+\frac{1}{2}
\end{aligned}
$$

Mathematica [A] time = 0.04, size = 99, normalized size = 1.00

$$\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)-\frac{1}{12}a^3c^2x^3+a^2c^2x^2\tan^{-1}(ax)+\frac{1}{2}ic^2\text{Li}_2(-iax)-\frac{1}{2}ic^2\text{Li}_2(iax)-\frac{3}{4}ac^2x+\frac{3}{4}c^2\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x])/x,x]
```

```
[Out] (-3*a*c^2*x)/4 - (a^3*c^2*x^3)/12 + (3*c^2*ArcTan[a*x])/4 + a^2*c^2*x^2*Arc
Tan[a*x] + (a^4*c^2*x^4*ArcTan[a*x])/4 + (I/2)*c^2*PolyLog[2, (-I)*a*x] - (
I/2)*c^2*PolyLog[2, I*a*x]
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 134, normalized size = 1.35

$$\frac{a^4c^2x^4\arctan(ax)}{4}+a^2c^2x^2\arctan(ax)+c^2\arctan(ax)\ln(ax)-\frac{a^3c^2x^3}{12}-\frac{3a\,c^2x}{4}+\frac{3c^2\arctan(ax)}{4}+\frac{ic^2\ln(ax)\ln}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)/x,x)
```

```
[Out] 1/4*a^4*c^2*x^4*arctan(a*x)+a^2*c^2*x^2*arctan(a*x)+c^2*arctan(a*x)*ln(a*x)
-1/12*a^3*c^2*x^3-3/4*a*c^2*x+3/4*c^2*arctan(a*x)+1/2*I*c^2*ln(a*x)*ln(1+I*
a*x)-1/2*I*c^2*ln(a*x)*ln(1-I*a*x)+1/2*I*c^2*dilog(1+I*a*x)-1/2*I*c^2*dilog
(1-I*a*x)
```

maxima [A] time = 0.51, size = 104, normalized size = 1.05

$$-\frac{1}{12}a^3c^2x^3-\frac{3}{4}ac^2x-\frac{1}{4}\pi c^2\log\left(a^2x^2+1\right)+c^2\arctan(ax)\log(ax)-\frac{1}{2}ic^2\mathrm{Li}_2(iax+1)+\frac{1}{2}ic^2\mathrm{Li}_2(-iax+1)+\frac{1}{4}\Big($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x,x, algorithm="maxima")
```

```
[Out] -1/12*a^3*c^2*x^3 - 3/4*a*c^2*x - 1/4*pi*c^2*log(a^2*x^2 + 1) + c^2*arctan(
a*x)*log(a*x) - 1/2*I*c^2*dilog(I*a*x + 1) + 1/2*I*c^2*dilog(-I*a*x + 1) +
1/4*(a^4*c^2*x^4 + 4*a^2*c^2*x^2 + 3*c^2)*arctan(a*x)
```

mupad [B] time = 0.61, size = 105, normalized size = 1.06

$$\begin{cases} 0 \\ 2\,a^2\,c^2\,\mathrm{atan}(a\,x)\left(\frac{1}{2\,a^2}+\frac{x^2}{2}\right)-a\,c^2\,x-\frac{c^2\left(3\,\mathrm{atan}(a\,x)-3\,a\,x+a^3\,x^3\right)}{12}+\frac{a^4\,c^2\,x^4\,\mathrm{atan}(a\,x)}{4}-\frac{c^2\,\mathrm{Li}_2(1-a\,x\,1\mathrm{i})\,1\mathrm{i}}{2}+\frac{c^2\,\mathrm{Li}_2(1+a\,x\,1\mathrm{i})\,1}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^2)/x,x)
```

```
[Out] piecewise(a == 0, 0, a ~= 0, - (c^2*dilog(- a*x*1i + 1)*1i)/2 + (c^2*dilog(
a*x*1i + 1)*1i)/2 - (c^2*(3*atan(a*x) - 3*a*x + a^3*x^3))/12 - a*c^2*x + 2*
a^2*c^2*atan(a*x)*(1/(2*a^2) + x^2/2) + (a^4*c^2*x^4*atan(a*x))/4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int\frac{\mathrm{atan}(ax)}{x}\,dx+\int 2a^2x\,\mathrm{atan}(ax)\,dx+\int a^4x^3\,\mathrm{atan}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)/x,x)
```

```
[Out] c**2*(Integral(atan(a*x)/x, x) + Integral(2*a**2*x*atan(a*x), x) + Integral
(a**4*x**3*atan(a*x), x))
```

3.162 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)}{x^2} \, dx$

Optimal. Leaf size=81

$$\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)-\frac{1}{6}a^3c^2x^2-\frac{4}{3}ac^2\log\left(a^2x^2+1\right)+2a^2c^2x\tan^{-1}(ax)+ac^2\log(x)-\frac{c^2\tan^{-1}(ax)}{x}$$

```
[Out] -1/6*a^3*c^2*x^2-c^2*arctan(a*x)/x+2*a^2*c^2*x*arctan(a*x)+1/3*a^4*c^2*x^3*
arctan(a*x)+a*c^2*ln(x)-4/3*a*c^2*ln(a^2*x^2+1)
```

Rubi [A] time = 0.12, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {4948, 4846, 260, 4852, 266, 36, 29, 31, 43}

$$-\frac{1}{6}a^3c^2x^2-\frac{4}{3}ac^2\log\left(a^2x^2+1\right)+\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)+2a^2c^2x\tan^{-1}(ax)+ac^2\log(x)-\frac{c^2\tan^{-1}(ax)}{x}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x])/x^2,x]
```

```
[Out] -(a^3*c^2*x^2)/6 - (c^2*ArcTan[a*x])/x + 2*a^2*c^2*x*ArcTan[a*x] + (a^4*c^2
*x^3*ArcTan[a*x])/3 + a*c^2*Log[x] - (4*a*c^2*Log[1 + a^2*x^2])/3
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}{x^2}\,dx &= \int \left(2a^2c^2\tan^{-1}(ax)+\frac{c^2\tan^{-1}(ax)}{x^2}+a^4c^2x^2\tan^{-1}(ax)\right)dx\\
&= c^2\int \frac{\tan^{-1}(ax)}{x^2}\,dx+\left(2a^2c^2\right)\int \tan^{-1}(ax)\,dx+\left(a^4c^2\right)\int x^2\tan^{-1}(ax)\,dx\\
&= -\frac{c^2\tan^{-1}(ax)}{x}+2a^2c^2x\tan^{-1}(ax)+\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)+\left(ac^2\right)\int \frac{1}{x\left(1+a^2x^2\right)}\\
&= -\frac{c^2\tan^{-1}(ax)}{x}+2a^2c^2x\tan^{-1}(ax)+\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)-ac^2\log\left(1+a^2x^2\right)+\\
&= -\frac{c^2\tan^{-1}(ax)}{x}+2a^2c^2x\tan^{-1}(ax)+\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)-ac^2\log\left(1+a^2x^2\right)+\\
&= -\frac{1}{6}a^3c^2x^2-\frac{c^2\tan^{-1}(ax)}{x}+2a^2c^2x\tan^{-1}(ax)+\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)+ac^2\log(x
\end{aligned}$$

Mathematica [A] time = 0.05, size = 62, normalized size = 0.77

$$\frac{c^2\left(2\left(a^4x^4+6a^2x^2-3\right)\tan^{-1}(ax)-ax\left(a^2x^2+8\log\left(a^2x^2+1\right)-6\log(x)\right)\right)}{6x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x])/x^2,x]
```

```
[Out] (c^2*(2*(-3 + 6*a^2*x^2 + a^4*x^4)*ArcTan[a*x] - a*x*(a^2*x^2 - 6*Log[x] +
8*Log[1 + a^2*x^2])))/(6*x)
```

fricas [A] time = 0.68, size = 75, normalized size = 0.93

$$-\frac{a^3c^2x^3+8\,ac^2x\log\left(a^2x^2+1\right)-6\,ac^2x\log(x)-2\left(a^4c^2x^4+6\,a^2c^2x^2-3\,c^2\right)\arctan(ax)}{6\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^2,x, algorithm="fricas")
```

```
[Out] -1/6*(a^3*c^2*x^3 + 8*a*c^2*x*log(a^2*x^2 + 1) - 6*a*c^2*x*log(x) - 2*(a^4*
c^2*x^4 + 6*a^2*c^2*x^2 - 3*c^2)*arctan(a*x))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 78, normalized size = 0.96

$$\frac{a^4c^2x^3\arctan(ax)}{3}+2a^2c^2x\arctan(ax)-\frac{c^2\arctan(ax)}{x}-\frac{a^3c^2x^2}{6}+a\,c^2\ln(ax)-\frac{4a\,c^2\ln\left(a^2x^2+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)/x^2,x)
```

```
[Out] 1/3*a^4*c^2*x^3*arctan(a*x)+2*a^2*c^2*x*arctan(a*x)-c^2*arctan(a*x)/x-1/6*a
^3*c^2*x^2+a*c^2*ln(a*x)-4/3*a*c^2*ln(a^2*x^2+1)
```

maxima [A] time = 0.32, size = 71, normalized size = 0.88

$$-\frac{1}{6}\left(a^2c^2x^2+8\,c^2\log\left(a^2x^2+1\right)-6\,c^2\log(x)\right)a+\frac{1}{3}\left(a^4c^2x^3+6\,a^2c^2x-\frac{3\,c^2}{x}\right)\arctan(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^2,x, algorithm="maxima")
```

```
[Out] -1/6*(a^2*c^2*x^2 + 8*c^2*log(a^2*x^2 + 1) - 6*c^2*log(x))*a + 1/3*(a^4*c^2
*x^3 + 6*a^2*c^2*x - 3*c^2/x)*arctan(a*x)
```

mupad [B] time = 0.21, size = 76, normalized size = 0.94

$$\frac{a^4\,c^2\,x^3\,\mathrm{atan}\left(a\,x\right)}{3}-\frac{c^2\,\mathrm{atan}\left(a\,x\right)}{x}-\frac{a^3\,c^2\,x^2}{6}-\frac{c^2\,\left(8\,a\,\ln\left(a^2\,x^2+1\right)-6\,a\,\ln(x)\right)}{6}+2\,a^2\,c^2\,x\,\mathrm{atan}\left(a\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^2)/x^2,x)
```

```
[Out] (a^4*c^2*x^3*atan(a*x))/3 - (c^2*atan(a*x))/x - (a^3*c^2*x^2)/6 - (c^2*(8*a
*log(a^2*x^2 + 1) - 6*a*log(x)))/6 + 2*a^2*c^2*x*atan(a*x)
```

sympy [A] time = 1.39, size = 82, normalized size = 1.01

$$\begin{cases} \frac{a^4c^2x^3\,\mathrm{atan}\,(ax)}{3}-\frac{a^3c^2x^2}{6}+2a^2c^2x\,\mathrm{atan}\,(ax)+ac^2\log(x)-\frac{4ac^2\log\left(x^2+\frac{1}{a^2}\right)}{3}-\frac{c^2\,\mathrm{atan}\,(ax)}{x} & \text{for}\ a\neq 0\\ 0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)/x**2,x)
```

```
[Out] Piecewise((a**4*c**2*x**3*atan(a*x)/3 - a**3*c**2*x**2/6 + 2*a**2*c**2*x*at
an(a*x) + a*c**2*log(x) - 4*a*c**2*log(x**2 + a**(-2))/3 - c**2*atan(a*x)/x
, Ne(a, 0)), (0, True))
```

3.163 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)}{x^3} dx$

Optimal. Leaf size=90

$$\frac{1}{2}a^4c^2x^2\tan^{-1}(ax) - \frac{1}{2}a^3c^2x + ia^2c^2\text{Li}_2(-iax) - ia^2c^2\text{Li}_2(iax) - \frac{c^2\tan^{-1}(ax)}{2x^2} - \frac{ac^2}{2x}$$

```
[Out] -1/2*a*c^2/x-1/2*a^3*c^2*x-1/2*c^2*arctan(a*x)/x^2+1/2*a^4*c^2*x^2*arctan(a
*x)+I*a^2*c^2*polylog(2,-I*a*x)-I*a^2*c^2*polylog(2,I*a*x)
```

Rubi [A] time = 0.12, antiderivative size = 90, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4948, 4852, 325, 203, 4848, 2391, 321}

$$ia^2c^2\text{PolyLog}(2,-iax) - ia^2c^2\text{PolyLog}(2,iax) + \frac{1}{2}a^4c^2x^2\tan^{-1}(ax) - \frac{1}{2}a^3c^2x - \frac{c^2\tan^{-1}(ax)}{2x^2} - \frac{ac^2}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x])/x^3,x]
```

```
[Out] -(a*c^2)/(2*x) - (a^3*c^2*x)/2 - (c^2*ArcTan[a*x])/(2*x^2) + (a^4*c^2*x^2*A
rcTan[a*x])/2 + I*a^2*c^2*PolyLog[2, (-I)*a*x] - I*a^2*c^2*PolyLog[2, I*a*x
]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}\int \frac{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}{x^3}\,dx &= \int \left(\frac{c^2\tan^{-1}(ax)}{x^3}+\frac{2a^2c^2\tan^{-1}(ax)}{x}+a^4c^2x\tan^{-1}(ax)\right)dx\\ &= c^2\int \frac{\tan^{-1}(ax)}{x^3}\,dx+\left(2a^2c^2\right)\int \frac{\tan^{-1}(ax)}{x}\,dx+\left(a^4c^2\right)\int x\tan^{-1}(ax)\,dx\\ &= -\frac{c^2\tan^{-1}(ax)}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)+\frac{1}{2}\left(ac^2\right)\int \frac{1}{x^2\left(1+a^2x^2\right)}\,dx+\left(ia^2c^2\right)\int \frac{\log}{}\\ &= -\frac{ac^2}{2x}-\frac{1}{2}a^3c^2x-\frac{c^2\tan^{-1}(ax)}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)+ia^2c^2\mathrm{Li}_2(-iax)-ia^2c^2\mathrm{Li}_2(i\end{aligned}$$

Mathematica [C] time = 0.05, size = 103, normalized size = 1.14

$$\frac{c^2\left(a^4x^4\tan^{-1}(ax)-a^3x^3-ax\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-a^2x^2\right)+2ia^2x^2\mathrm{Li}_2(-iax)-2ia^2x^2\mathrm{Li}_2(iax)+a^2x^2\tan^{-1}(ax)-\tan^{-1}\right.}{2x^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x])/x^3,x]
```

```
[Out] (c^2*(-(a^3*x^3) - ArcTan[a*x] + a^2*x^2*ArcTan[a*x] + a^4*x^4*ArcTan[a*x]
- a*x*Hypergeometric2F1[-1/2, 1, 1/2, -(a^2*x^2)] + (2*I)*a^2*x^2*PolyLog[2
, (-I)*a*x] - (2*I)*a^2*x^2*PolyLog[2, I*a*x]))/(2*x^2)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 139, normalized size = 1.54

$$\frac{a^4c^2x^2\arctan(ax)}{2}+2a^2c^2\arctan(ax)\ln(ax)-\frac{c^2\arctan(ax)}{2x^2}-\frac{a^3c^2x}{2}-\frac{ac^2}{2x}+ia^2c^2\ln(ax)\ln(iax+1)-ia^2c^2\ln($$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)/x^3,x)
```

```
[Out] 1/2*a^4*c^2*x^2*arctan(a*x)+2*a^2*c^2*arctan(a*x)*ln(a*x)-1/2*c^2*arctan(a*
x)/x^2-1/2*a^3*c^2*x-1/2*a*c^2/x+I*a^2*c^2*ln(a*x)*ln(1+I*a*x)-I*a^2*c^2*ln
(a*x)*ln(1-I*a*x)+I*a^2*c^2*dilog(1+I*a*x)-I*a^2*c^2*dilog(1-I*a*x)
```

maxima [A] time = 0.49, size = 120, normalized size = 1.33

$$-\frac{a^3c^2x^3+\pi a^2c^2x^2\log\left(a^2x^2+1\right)-4a^2c^2x^2\arctan(ax)\log(ax)+2ia^2c^2x^2\mathrm{Li}_2(iax+1)-2ia^2c^2x^2\mathrm{Li}_2(-iax}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^3*c^2*x^3 + pi*a^2*c^2*x^2*log(a^2*x^2 + 1) - 4*a^2*c^2*x^2*arctan(
a*x)*log(a*x) + 2*I*a^2*c^2*x^2*dilog(I*a*x + 1) - 2*I*a^2*c^2*x^2*dilog(-I
*a*x + 1) + a*c^2*x - (a^4*c^2*x^4 - c^2)*arctan(a*x))/x^2
```

mupad [B] time = 0.50, size = 110, normalized size = 1.22

$$\begin{cases} 0 \\ a^4\,c^2\,\mathrm{atan}\left(a\,x\right)\,\left(\frac{1}{2\,a^2}+\frac{x^2}{2}\right)-\frac{c^2\,\mathrm{atan}(a\,x)}{2\,x^2}-\frac{c^2\,\left(a^3\,\mathrm{atan}(a\,x)+\frac{a^2}{x}\right)}{2\,a}-\frac{a^3\,c^2\,x}{2}-a^2\,c^2\,\mathrm{Li}_2\left(1-a\,x\,1\mathrm{i}\right)\,1\mathrm{i}+a^2\,c^2\,\mathrm{Li}_2\left(1+a\,x\right. \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^2)/x^3,x)
```

```
[Out] piecewise(a == 0, 0, a ~= 0, - (a^3*c^2*x)/2 - (c^2*atan(a*x))/(2*x^2) - a^
2*c^2*dilog(- a*x*1i + 1)*1i + a^2*c^2*dilog(a*x*1i + 1)*1i - (c^2*(a^3*ata
n(a*x) + a^2/x))/(2*a) + a^4*c^2*atan(a*x)*(1/(2*a^2) + x^2/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int\frac{\mathrm{atan}(ax)}{x^3}\,dx+\int\frac{2a^2\,\mathrm{atan}(ax)}{x}\,dx+\int a^4x\,\mathrm{atan}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)/x**3,x)
```

```
[Out] c**2*(Integral(atan(a*x)/x**3, x) + Integral(2*a**2*atan(a*x)/x, x) + Integ
ral(a**4*x*atan(a*x), x))
```

3.164 $\int \frac{\left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)}{x^4} \, dx$

Optimal. Leaf size=85

$$a^4 c^2 x \tan^{-1}(a x)+\frac{5}{3} a^3 c^2 \log (x)-\frac{2 a^2 c^2 \tan^{-1}(a x)}{x}-\frac{4}{3} a^3 c^2 \log \left(a^2 x^2+1\right)-\frac{c^2 \tan^{-1}(a x)}{3 x^3}-\frac{a c^2}{6 x^2}$$

```
[Out] -1/6*a*c^2/x^2-1/3*c^2*arctan(a*x)/x^3-2*a^2*c^2*arctan(a*x)/x+a^4*c^2*x*ar
ctan(a*x)+5/3*a^3*c^2*ln(x)-4/3*a^3*c^2*ln(a^2*x^2+1)
```

Rubi [A] time = 0.12, antiderivative size = 85, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {4948, 4846, 260, 4852, 266, 44, 36, 29, 31}

$$-\frac{4}{3} a^3 c^2 \log \left(a^2 x^2+1\right)+\frac{5}{3} a^3 c^2 \log (x)+a^4 c^2 x \tan^{-1}(a x)-\frac{2 a^2 c^2 \tan^{-1}(a x)}{x}-\frac{a c^2}{6 x^2}-\frac{c^2 \tan^{-1}(a x)}{3 x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x])/x^4,x]
```

```
[Out] -(a*c^2)/(6*x^2) - (c^2*ArcTan[a*x])/(3*x^3) - (2*a^2*c^2*ArcTan[a*x])/x +
a^4*c^2*x*ArcTan[a*x] + (5*a^3*c^2*Log[x])/3 - (4*a^3*c^2*Log[1 + a^2*x^2])
/3
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}{x^4}\,dx &= \int \left(a^4c^2\tan^{-1}(ax)+\frac{c^2\tan^{-1}(ax)}{x^4}+\frac{2a^2c^2\tan^{-1}(ax)}{x^2}\right)dx\\
&= c^2\int \frac{\tan^{-1}(ax)}{x^4}\,dx+\left(2a^2c^2\right)\int \frac{\tan^{-1}(ax)}{x^2}\,dx+\left(a^4c^2\right)\int \tan^{-1}(ax)\,dx\\
&= -\frac{c^2\tan^{-1}(ax)}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)}{x}+a^4c^2x\tan^{-1}(ax)+\frac{1}{3}\left(ac^2\right)\int \frac{1}{x^3\left(1+a^2x^2\right)}\\
&= -\frac{c^2\tan^{-1}(ax)}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)}{x}+a^4c^2x\tan^{-1}(ax)-\frac{1}{2}a^3c^2\log\left(1+a^2x^2\right)+\\
&= -\frac{c^2\tan^{-1}(ax)}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)}{x}+a^4c^2x\tan^{-1}(ax)-\frac{1}{2}a^3c^2\log\left(1+a^2x^2\right)+\\
&= -\frac{ac^2}{6x^2}-\frac{c^2\tan^{-1}(ax)}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)}{x}+a^4c^2x\tan^{-1}(ax)+\frac{5}{3}a^3c^2\log(x)-\frac{4}{3}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 68, normalized size = 0.80

$$\frac{c^2\left(ax\left(10a^2x^2\log(x)-8a^2x^2\log\left(a^2x^2+1\right)-1\right)+2\left(3a^4x^4-6a^2x^2-1\right)\tan^{-1}(ax)\right)}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x])/x^4,x]
```

```
[Out] (c^2*(2*(-1 - 6*a^2*x^2 + 3*a^4*x^4)*ArcTan[a*x] + a*x*(-1 + 10*a^2*x^2*Log
[x] - 8*a^2*x^2*Log[1 + a^2*x^2])))/(6*x^3)
```

fricas [A] time = 0.63, size = 80, normalized size = 0.94

$$-\frac{8\,a^3c^2x^3\log\left(a^2x^2+1\right)-10\,a^3c^2x^3\log(x)+ac^2x-2\left(3\,a^4c^2x^4-6\,a^2c^2x^2-c^2\right)\arctan\left(ax\right)}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^4,x, algorithm="fricas")
```

```
[Out] -1/6*(8*a^3*c^2*x^3*log(a^2*x^2 + 1) - 10*a^3*c^2*x^3*log(x) + a*c^2*x - 2*
(3*a^4*c^2*x^4 - 6*a^2*c^2*x^2 - c^2)*arctan(a*x))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 80, normalized size = 0.94

$$a^4c^2x\arctan(ax)-\frac{c^2\arctan(ax)}{3x^3}-\frac{2a^2c^2\arctan(ax)}{x}-\frac{a\,c^2}{6x^2}+\frac{5a^3c^2\ln(ax)}{3}-\frac{4a^3c^2\ln\left(a^2x^2+1\right)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)/x^4,x)
```

```
[Out] a^4*c^2*x*arctan(a*x)-1/3*c^2*arctan(a*x)/x^3-2*a^2*c^2*arctan(a*x)/x-1/6*a
*c^2/x^2+5/3*a^3*c^2*ln(a*x)-4/3*a^3*c^2*ln(a^2*x^2+1)
```

maxima [A] time = 0.33, size = 76, normalized size = 0.89

$$-\frac{1}{6}\left(8\,a^2c^2\log\left(a^2x^2+1\right)-10\,a^2c^2\log(x)+\frac{c^2}{x^2}\right)a+\frac{1}{3}\left(3\,a^4c^2x-\frac{6\,a^2c^2x^2+c^2}{x^3}\right)\arctan(ax)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*(8*a^2*c^2*log(a^2*x^2 + 1) - 10*a^2*c^2*log(x) + c^2/x^2)*a + 1/3*(3*
a^4*c^2*x - (6*a^2*c^2*x^2 + c^2)/x^3)*arctan(a*x)
```

mupad [B] time = 0.47, size = 78, normalized size = 0.92

$$\frac{c^2\,\left(10\,a^3\,\ln(x)-8\,a^3\,\ln\left(a^2\,x^2+1\right)\right)}{6}-\frac{\frac{c^2\,\mathrm{atan}(a\,x)}{3}+\frac{a\,c^2\,x}{6}+2\,a^2\,c^2\,x^2\,\mathrm{atan}\left(a\,x\right)}{x^3}+a^4\,c^2\,x\,\mathrm{atan}\left(a\,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^2)/x^4,x)
```

```
[Out] (c^2*(10*a^3*log(x) - 8*a^3*log(a^2*x^2 + 1)))/6 - ((c^2*atan(a*x))/3 + (a*
c^2*x)/6 + 2*a^2*c^2*x^2*atan(a*x))/x^3 + a^4*c^2*x*atan(a*x)
```

sympy [A] time = 1.40, size = 87, normalized size = 1.02

$$\begin{cases} a^4c^2x\,\mathrm{atan}\,(ax)+\frac{5a^3c^2\log(x)}{3}-\frac{4a^3c^2\log\left(x^2+\frac{1}{a^2}\right)}{3}-\frac{2a^2c^2\,\mathrm{atan}\,(ax)}{x}-\frac{ac^2}{6x^2}-\frac{c^2\,\mathrm{atan}\,(ax)}{3x^3} & \text{for } a\neq 0 \\ 0 & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)/x**4,x)
```

```
[Out] Piecewise((a**4*c**2*x*atan(a*x) + 5*a**3*c**2*log(x)/3 - 4*a**3*c**2*log(x
**2 + a**(-2))/3 - 2*a**2*c**2*atan(a*x)/x - a*c**2/(6*x**2) - c**2*atan(a*
x)/(3*x**3), Ne(a, 0)), (0, True))
```

3.165 $\int x^3 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax) \, dx$

Optimal. Leaf size=141

$$\frac{1}{10}a^6c^3x^{10}\tan^{-1}(ax)-\frac{1}{90}a^5c^3x^9+\frac{3}{8}a^4c^3x^8\tan^{-1}(ax)-\frac{c^3\tan^{-1}(ax)}{40a^4}-\frac{11}{280}a^3c^3x^7+\frac{c^3x}{40a^3}+\frac{1}{2}a^2c^3x^6\tan^{-1}(ax)-\frac{9}{200}$$

```
[Out] 1/40*c^3*x/a^3-1/120*c^3*x^3/a-9/200*a*c^3*x^5-11/280*a^3*c^3*x^7-1/90*a^5*
c^3*x^9-1/40*c^3*arctan(a*x)/a^4+1/4*c^3*x^4*arctan(a*x)+1/2*a^2*c^3*x^6*ar
ctan(a*x)+3/8*a^4*c^3*x^8*arctan(a*x)+1/10*a^6*c^3*x^10*arctan(a*x)
```

Rubi [A] time = 0.21, antiderivative size = 141, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4948, 4852, 302, 203}

$$-\frac{1}{90}a^5c^3x^9-\frac{11}{280}a^3c^3x^7+\frac{1}{10}a^6c^3x^{10}\tan^{-1}(ax)+\frac{3}{8}a^4c^3x^8\tan^{-1}(ax)+\frac{1}{2}a^2c^3x^6\tan^{-1}(ax)+\frac{c^3x}{40a^3}-\frac{c^3\tan^{-1}(ax)}{40a^4}-\frac{9}{20}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] (c^3*x)/(40*a^3) - (c^3*x^3)/(120*a) - (9*a*c^3*x^5)/200 - (11*a^3*c^3*x^7)
/280 - (a^5*c^3*x^9)/90 - (c^3*ArcTan[a*x])/(40*a^4) + (c^3*x^4*ArcTan[a*x]
)/4 + (a^2*c^3*x^6*ArcTan[a*x])/2 + (3*a^4*c^3*x^8*ArcTan[a*x])/8 + (a^6*c^
3*x^10*ArcTan[a*x])/10
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^3 \left(c + a^2 c x^2\right)^3 \tan^{-1}(ax)\,dx = \int \left(c^3 x^3 \tan^{-1}(ax) + 3a^2c^3x^5 \tan^{-1}(ax) + 3a^4c^3x^7 \tan^{-1}(ax) + a^6c^3x^9 \tan^{-1}(ax)\right.$$
$$= c^3 \int x^3 \tan^{-1}(ax)\,dx + \left(3a^2c^3\right) \int x^5 \tan^{-1}(ax)\,dx + \left(3a^4c^3\right) \int x^7 \tan^{-1}(ax)\,dx$$
$$= \frac{1}{4}c^3x^4 \tan^{-1}(ax) + \frac{1}{2}a^2c^3x^6 \tan^{-1}(ax) + \frac{3}{8}a^4c^3x^8 \tan^{-1}(ax) + \frac{1}{10}a^6c^3x^{10} \tan^{-1}(a$$
$$= \frac{1}{4}c^3x^4 \tan^{-1}(ax) + \frac{1}{2}a^2c^3x^6 \tan^{-1}(ax) + \frac{3}{8}a^4c^3x^8 \tan^{-1}(ax) + \frac{1}{10}a^6c^3x^{10} \tan^{-1}(a$$
$$= \frac{c^3x}{40a^3} - \frac{c^3x^3}{120a} - \frac{9}{200}ac^3x^5 - \frac{11}{280}a^3c^3x^7 - \frac{1}{90}a^5c^3x^9 + \frac{1}{4}c^3x^4 \tan^{-1}(ax) + \frac{1}{2}a^2c^3$$
$$= \frac{c^3x}{40a^3} - \frac{c^3x^3}{120a} - \frac{9}{200}ac^3x^5 - \frac{11}{280}a^3c^3x^7 - \frac{1}{90}a^5c^3x^9 - \frac{c^3 \tan^{-1}(ax)}{40a^4} + \frac{1}{4}c^3x^4 \tan$$

Mathematica [A] time = 0.14, size = 141, normalized size = 1.00

$$\frac{1}{10}a^6c^3x^{10} \tan^{-1}(ax) - \frac{1}{90}a^5c^3x^9 + \frac{3}{8}a^4c^3x^8 \tan^{-1}(ax) - \frac{c^3 \tan^{-1}(ax)}{40a^4} - \frac{11}{280}a^3c^3x^7 + \frac{c^3x}{40a^3} + \frac{1}{2}a^2c^3x^6 \tan^{-1}(ax) - \frac{9}{200}ac$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] (c^3*x)/(40*a^3) - (c^3*x^3)/(120*a) - (9*a*c^3*x^5)/200 - (11*a^3*c^3*x^7)
/280 - (a^5*c^3*x^9)/90 - (c^3*ArcTan[a*x])/(40*a^4) + (c^3*x^4*ArcTan[a*x]
)/4 + (a^2*c^3*x^6*ArcTan[a*x])/2 + (3*a^4*c^3*x^8*ArcTan[a*x])/8 + (a^6*c^
3*x^10*ArcTan[a*x])/10
```

fricas [A] time = 0.57, size = 113, normalized size = 0.80

$$-\frac{140\,a^9c^3x^9 + 495\,a^7c^3x^7 + 567\,a^5c^3x^5 + 105\,a^3c^3x^3 - 315\,ac^3x - 315\left(4\,a^{10}c^3x^{10} + 15\,a^8c^3x^8 + 20\,a^6c^3x^6 + 10\,a^4\right.}{12600\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/12600*(140*a^9*c^3*x^9 + 495*a^7*c^3*x^7 + 567*a^5*c^3*x^5 + 105*a^3*c^3
*x^3 - 315*a*c^3*x - 315*(4*a^10*c^3*x^10 + 15*a^8*c^3*x^8 + 20*a^6*c^3*x^6
 + 10*a^4*c^3*x^4 - c^3)*arctan(a*x))/a^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.02, size = 122, normalized size = 0.87

$$\frac{c^3x}{40a^3} - \frac{c^3x^3}{120a} - \frac{9a\,c^3x^5}{200} - \frac{11a^3c^3x^7}{280} - \frac{a^5c^3x^9}{90} - \frac{c^3 \arctan(ax)}{40a^4} + \frac{c^3x^4 \arctan(ax)}{4} + \frac{a^2c^3x^6 \arctan(ax)}{2} + \frac{3a^4c^3x^8 \arctan(}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^3*arctan(a*x),x)
```

```
[Out] 1/40*c^3*x/a^3-1/120*c^3*x^3/a-9/200*a*c^3*x^5-11/280*a^3*c^3*x^7-1/90*a^5*
c^3*x^9-1/40*c^3*arctan(a*x)/a^4+1/4*c^3*x^4*arctan(a*x)+1/2*a^2*c^3*x^6*ar
ctan(a*x)+3/8*a^4*c^3*x^8*arctan(a*x)+1/10*a^6*c^3*x^10*arctan(a*x)
```

maxima [A] time = 0.42, size = 120, normalized size = 0.85

$$-\frac{1}{12600}\,a\left(\frac{315\,c^3\arctan\left(ax\right)}{a^5}+\frac{140\,a^8c^3x^9+495\,a^6c^3x^7+567\,a^4c^3x^5+105\,a^2c^3x^3-315\,c^3x}{a^4}\right)+\frac{1}{40}\left(4\,a^6c^3x^{10}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/12600*a*(315*c^3*arctan(a*x)/a^5 + (140*a^8*c^3*x^9 + 495*a^6*c^3*x^7 +
567*a^4*c^3*x^5 + 105*a^2*c^3*x^3 - 315*c^3*x)/a^4) + 1/40*(4*a^6*c^3*x^10
+ 15*a^4*c^3*x^8 + 20*a^2*c^3*x^6 + 10*c^3*x^4)*arctan(a*x)
```

mupad [B] time = 0.44, size = 111, normalized size = 0.79

$$\mathrm{atan}\left(a\,x\right)\,\left(\frac{a^6\,c^3\,x^{10}}{10}+\frac{3\,a^4\,c^3\,x^8}{8}+\frac{a^2\,c^3\,x^6}{2}+\frac{c^3\,x^4}{4}\right)+\frac{c^3\,x}{40\,a^3}-\frac{9\,a\,c^3\,x^5}{200}-\frac{c^3\,\mathrm{atan}\left(a\,x\right)}{40\,a^4}-\frac{c^3\,x^3}{120\,a}-\frac{11\,a^3\,c^3\,x^7}{280}-\frac{a^5\,c^3}{90}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)*(c + a^2*c*x^2)^3,x)
```

```
[Out] atan(a*x)*((c^3*x^4)/4 + (a^2*c^3*x^6)/2 + (3*a^4*c^3*x^8)/8 + (a^6*c^3*x^1
0)/10) + (c^3*x)/(40*a^3) - (9*a*c^3*x^5)/200 - (c^3*atan(a*x))/(40*a^4) -
(c^3*x^3)/(120*a) - (11*a^3*c^3*x^7)/280 - (a^5*c^3*x^9)/90
```

sympy [A] time = 3.83, size = 138, normalized size = 0.98

$$\begin{cases}\frac{a^6c^3x^{10}\operatorname{atan}(ax)}{10}-\frac{a^5c^3x^9}{90}+\frac{3a^4c^3x^8\operatorname{atan}(ax)}{8}-\frac{11a^3c^3x^7}{280}+\frac{a^2c^3x^6\operatorname{atan}(ax)}{2}-\frac{9ac^3x^5}{200}+\frac{c^3x^4\operatorname{atan}(ax)}{4}-\frac{c^3x^3}{120a}+\frac{c^3x}{40a^3}-\frac{c^3\operatorname{atan}(a}{40a^4} \\ 0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**3*atan(a*x),x)
```

```
[Out] Piecewise((a**6*c**3*x**10*atan(a*x)/10 - a**5*c**3*x**9/90 + 3*a**4*c**3*x
**8*atan(a*x)/8 - 11*a**3*c**3*x**7/280 + a**2*c**3*x**6*atan(a*x)/2 - 9*a*
c**3*x**5/200 + c**3*x**4*atan(a*x)/4 - c**3*x**3/(120*a) + c**3*x/(40*a**3
) - c**3*atan(a*x)/(40*a**4), Ne(a, 0)), (0, True))
```

3.166 $\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)\,dx$

Optimal. Leaf size=136

$$\frac{1}{9}a^6c^3x^9\tan^{-1}(ax)-\frac{1}{72}a^5c^3x^8+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)-\frac{10}{189}a^3c^3x^6+\frac{3}{5}a^2c^3x^5\tan^{-1}(ax)+\frac{8c^3\log\left(a^2x^2+1\right)}{315a^3}-\frac{89ac^3x^4}{1260}+$$

```
[Out] -8/315*c^3*x^2/a-89/1260*a*c^3*x^4-10/189*a^3*c^3*x^6-1/72*a^5*c^3*x^8+1/3*
c^3*x^3*arctan(a*x)+3/5*a^2*c^3*x^5*arctan(a*x)+3/7*a^4*c^3*x^7*arctan(a*x)
+1/9*a^6*c^3*x^9*arctan(a*x)+8/315*c^3*ln(a^2*x^2+1)/a^3
```

Rubi [A] time = 0.23, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4948, 4852, 266, 43}

$$-\frac{1}{72}a^5c^3x^8-\frac{10}{189}a^3c^3x^6+\frac{8c^3\log\left(a^2x^2+1\right)}{315a^3}+\frac{1}{9}a^6c^3x^9\tan^{-1}(ax)+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)+\frac{3}{5}a^2c^3x^5\tan^{-1}(ax)-\frac{89ac^3x^4}{1260}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] (-8*c^3*x^2)/(315*a) - (89*a*c^3*x^4)/1260 - (10*a^3*c^3*x^6)/189 - (a^5*c^
3*x^8)/72 + (c^3*x^3*ArcTan[a*x])/3 + (3*a^2*c^3*x^5*ArcTan[a*x])/5 + (3*a^
4*c^3*x^7*ArcTan[a*x])/7 + (a^6*c^3*x^9*ArcTan[a*x])/9 + (8*c^3*Log[1 + a^2
*x^2])/(315*a^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}\int x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)\,dx &= \int\left(c^3x^2\tan^{-1}(ax)+3a^2c^3x^4\tan^{-1}(ax)+3a^4c^3x^6\tan^{-1}(ax)+a^6c^3x^8\tan^{-1}(\right.\\
&= c^3\int x^2\tan^{-1}(ax)\,dx+\left(3a^2c^3\right)\int x^4\tan^{-1}(ax)\,dx+\left(3a^4c^3\right)\int x^6\tan^{-1}(ax)\\
&= \frac{1}{3}c^3x^3\tan^{-1}(ax)+\frac{3}{5}a^2c^3x^5\tan^{-1}(ax)+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)+\frac{1}{9}a^6c^3x^9\tan^{-1}(\\
&= \frac{1}{3}c^3x^3\tan^{-1}(ax)+\frac{3}{5}a^2c^3x^5\tan^{-1}(ax)+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)+\frac{1}{9}a^6c^3x^9\tan^{-1}(\\
&= \frac{1}{3}c^3x^3\tan^{-1}(ax)+\frac{3}{5}a^2c^3x^5\tan^{-1}(ax)+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)+\frac{1}{9}a^6c^3x^9\tan^{-1}(\\
&= -\frac{8c^3x^2}{315a}-\frac{89ac^3x^4}{1260}-\frac{10}{189}a^3c^3x^6-\frac{1}{72}a^5c^3x^8+\frac{1}{3}c^3x^3\tan^{-1}(ax)+\frac{3}{5}a^2c^3x^5\,\mathrm{ta}\end{aligned}$$

Mathematica [A] time = 0.09, size = 136, normalized size = 1.00

$$\frac{1}{9}a^6c^3x^9\tan^{-1}(ax)-\frac{1}{72}a^5c^3x^8+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)-\frac{10}{189}a^3c^3x^6+\frac{3}{5}a^2c^3x^5\tan^{-1}(ax)+\frac{8c^3\log\left(a^2x^2+1\right)}{315a^3}-\frac{89ac^3x}{1260}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] (-8*c^3*x^2)/(315*a) - (89*a*c^3*x^4)/1260 - (10*a^3*c^3*x^6)/189 - (a^5*c^
3*x^8)/72 + (c^3*x^3*ArcTan[a*x])/3 + (3*a^2*c^3*x^5*ArcTan[a*x])/5 + (3*a^
4*c^3*x^7*ArcTan[a*x])/7 + (a^6*c^3*x^9*ArcTan[a*x])/9 + (8*c^3*Log[1 + a^2
*x^2])/(315*a^3)
```

fricas [A] time = 0.50, size = 116, normalized size = 0.85

$$-\frac{105\,a^8c^3x^8+400\,a^6c^3x^6+534\,a^4c^3x^4+192\,a^2c^3x^2-192\,c^3\log\left(a^2x^2+1\right)-24\left(35\,a^9c^3x^9+135\,a^7c^3x^7+18\right.}{7560\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/7560*(105*a^8*c^3*x^8 + 400*a^6*c^3*x^6 + 534*a^4*c^3*x^4 + 192*a^2*c^3*
x^2 - 192*c^3*log(a^2*x^2 + 1) - 24*(35*a^9*c^3*x^9 + 135*a^7*c^3*x^7 + 189
*a^5*c^3*x^5 + 105*a^3*c^3*x^3)*arctan(a*x))/a^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 119, normalized size = 0.88

$$-\frac{8c^3x^2}{315a}-\frac{89a\,c^3x^4}{1260}-\frac{10a^3c^3x^6}{189}-\frac{a^5c^3x^8}{72}+\frac{c^3x^3\arctan(ax)}{3}+\frac{3a^2c^3x^5\arctan(ax)}{5}+\frac{3a^4c^3x^7\arctan(ax)}{7}+\frac{a^6c^3x^9\,\mathrm{ar}}{9}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^3*arctan(a*x),x)
```

```
[Out] -8/315*c^3*x^2/a-89/1260*a*c^3*x^4-10/189*a^3*c^3*x^6-1/72*a^5*c^3*x^8+1/3*
c^3*x^3*arctan(a*x)+3/5*a^2*c^3*x^5*arctan(a*x)+3/7*a^4*c^3*x^7*arctan(a*x)
+1/9*a^6*c^3*x^9*arctan(a*x)+8/315*c^3*ln(a^2*x^2+1)/a^3
```

maxima [A] time = 0.32, size = 118, normalized size = 0.87

$$\frac{1}{7560}\,a\left(\frac{192\,c^3\log\left(a^2x^2+1\right)}{a^4}-\frac{105\,a^6c^3x^8+400\,a^4c^3x^6+534\,a^2c^3x^4+192\,c^3x^2}{a^2}\right)+\frac{1}{315}\left(35\,a^6c^3x^9+135\,a^4c^3x^7\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="maxima")
```

```
[Out] 1/7560*a*(192*c^3*log(a^2*x^2 + 1)/a^4 - (105*a^6*c^3*x^8 + 400*a^4*c^3*x^6
 + 534*a^2*c^3*x^4 + 192*c^3*x^2)/a^2) + 1/315*(35*a^6*c^3*x^9 + 135*a^4*c^
3*x^7 + 189*a^2*c^3*x^5 + 105*c^3*x^3)*arctan(a*x)
```

mupad [B] time = 0.44, size = 108, normalized size = 0.79

$$\mathrm{atan}\left(a\,x\right)\,\left(\frac{a^6\,c^3\,x^9}{9}+\frac{3\,a^4\,c^3\,x^7}{7}+\frac{3\,a^2\,c^3\,x^5}{5}+\frac{c^3\,x^3}{3}\right)-\frac{89\,a\,c^3\,x^4}{1260}+\frac{8\,c^3\,\ln\left(a^2\,x^2+1\right)}{315\,a^3}-\frac{8\,c^3\,x^2}{315\,a}-\frac{10\,a^3\,c^3\,x^6}{189}-\frac{a^5\,c^3\,x}{72}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)*(c + a^2*c*x^2)^3,x)
```

```
[Out] atan(a*x)*((c^3*x^3)/3 + (3*a^2*c^3*x^5)/5 + (3*a^4*c^3*x^7)/7 + (a^6*c^3*x
^9)/9) - (89*a*c^3*x^4)/1260 + (8*c^3*log(a^2*x^2 + 1))/(315*a^3) - (8*c^3*
x^2)/(315*a) - (10*a^3*c^3*x^6)/189 - (a^5*c^3*x^8)/72
```

sympy [A] time = 2.97, size = 138, normalized size = 1.01

$$\begin{cases} \frac{a^6c^3x^9\,\mathrm{atan}\,(ax)}{9}-\frac{a^5c^3x^8}{72}+\frac{3a^4c^3x^7\,\mathrm{atan}\,(ax)}{7}-\frac{10a^3c^3x^6}{189}+\frac{3a^2c^3x^5\,\mathrm{atan}\,(ax)}{5}-\frac{89ac^3x^4}{1260}+\frac{c^3x^3\,\mathrm{atan}\,(ax)}{3}-\frac{8c^3x^2}{315a}+\frac{8c^3\log\left(x^2+\frac{1}{a^2}\right)}{315a^3} & \\ 0 & \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**3*atan(a*x),x)
```

```
[Out] Piecewise((a**6*c**3*x**9*atan(a*x)/9 - a**5*c**3*x**8/72 + 3*a**4*c**3*x**
7*atan(a*x)/7 - 10*a**3*c**3*x**6/189 + 3*a**2*c**3*x**5*atan(a*x)/5 - 89*a
*c**3*x**4/1260 + c**3*x**3*atan(a*x)/3 - 8*c**3*x**2/(315*a) + 8*c**3*log(
x**2 + a**(-2))/(315*a**3), Ne(a, 0)), (0, True))
```

3.167 $\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)\,dx$

Optimal. Leaf size=74

$$-\frac{1}{56}a^5c^3x^7-\frac{3}{40}a^3c^3x^5+\frac{c^3\left(a^2x^2+1\right)^4\tan^{-1}(ax)}{8a^2}-\frac{1}{8}ac^3x^3-\frac{c^3x}{8a}$$

```
[Out] -1/8*c^3*x/a-1/8*a*c^3*x^3-3/40*a^3*c^3*x^5-1/56*a^5*c^3*x^7+1/8*c^3*(a^2*x
^2+1)^4*arctan(a*x)/a^2
```

Rubi [A] time = 0.05, antiderivative size = 74, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 2, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.111, Rules used = {4930, 194}

$$-\frac{1}{56}a^5c^3x^7-\frac{3}{40}a^3c^3x^5+\frac{c^3\left(a^2x^2+1\right)^4\tan^{-1}(ax)}{8a^2}-\frac{1}{8}ac^3x^3-\frac{c^3x}{8a}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] -(c^3*x)/(8*a) - (a*c^3*x^3)/8 - (3*a^3*c^3*x^5)/40 - (a^5*c^3*x^7)/56 + (c
^3*(1 + a^2*x^2)^4*ArcTan[a*x])/(8*a^2)
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)\,dx&=\frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)}{8a^2}-\frac{\int\left(c+a^2cx^2\right)^3\,dx}{8a}\\&=\frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)}{8a^2}-\frac{\int\left(c^3+3a^2c^3x^2+3a^4c^3x^4+a^6c^3x^6\right)\,dx}{8a}\\&=-\frac{c^3x}{8a}-\frac{1}{8}ac^3x^3-\frac{3}{40}a^3c^3x^5-\frac{1}{56}a^5c^3x^7+\frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)}{8a^2}\end{aligned}$$

Mathematica [A] time = 0.09, size = 128, normalized size = 1.73

$$\frac{1}{8}a^6c^3x^8\tan^{-1}(ax)-\frac{1}{56}a^5c^3x^7+\frac{1}{2}a^4c^3x^6\tan^{-1}(ax)-\frac{3}{40}a^3c^3x^5+\frac{3}{4}a^2c^3x^4\tan^{-1}(ax)+\frac{c^3\tan^{-1}(ax)}{8a^2}-\frac{1}{8}ac^3x^3+\frac{1}{2}c^3x$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] -1/8*(c^3*x)/a - (a*c^3*x^3)/8 - (3*a^3*c^3*x^5)/40 - (a^5*c^3*x^7)/56 + (c
^3*ArcTan[a*x])/(8*a^2) + (c^3*x^2*ArcTan[a*x])/2 + (3*a^2*c^3*x^4*ArcTan[a
*x])/4 + (a^4*c^3*x^6*ArcTan[a*x])/2 + (a^6*c^3*x^8*ArcTan[a*x])/8
```

fricas [A] time = 0.61, size = 99, normalized size = 1.34

$$-\frac{5\,a^{7}c^{3}x^{7}+21\,a^{5}c^{3}x^{5}+35\,a^{3}c^{3}x^{3}+35\,ac^{3}x-35\left(a^{8}c^{3}x^{8}+4\,a^{6}c^{3}x^{6}+6\,a^{4}c^{3}x^{4}+4\,a^{2}c^{3}x^{2}+c^{3}\right)\arctan\left(ax\right)}{280\,a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/280*(5*a^7*c^3*x^7 + 21*a^5*c^3*x^5 + 35*a^3*c^3*x^3 + 35*a*c^3*x - 35*(
a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2 + c^3)*arctan(a
*x))/a^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 111, normalized size = 1.50

$$\frac{a^{6}c^{3}\arctan\left(ax\right)x^{8}}{8}+\frac{a^{4}c^{3}\arctan\left(ax\right)x^{6}}{2}+\frac{3a^{2}c^{3}\arctan\left(ax\right)x^{4}}{4}+\frac{c^{3}\arctan\left(ax\right)x^{2}}{2}-\frac{a^{5}c^{3}x^{7}}{56}-\frac{3a^{3}c^{3}x^{5}}{40}-\frac{a\,c^{3}x^{3}}{8}-\frac{c^{3}x}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3*arctan(a*x),x)
```

```
[Out] 1/8*a^6*c^3*arctan(a*x)*x^8+1/2*a^4*c^3*arctan(a*x)*x^6+3/4*a^2*c^3*arctan(
a*x)*x^4+1/2*c^3*arctan(a*x)*x^2-1/56*a^5*c^3*x^7-3/40*a^3*c^3*x^5-1/8*a*c^
3*x^3-1/8*c^3*x/a+1/8/a^2*c^3*arctan(a*x)
```

maxima [A] time = 0.32, size = 73, normalized size = 0.99

$$\frac{\left(a^{2}cx^{2}+c\right)^{4}\arctan\left(ax\right)}{8\,a^{2}c}-\frac{5\,a^{6}c^{4}x^{7}+21\,a^{4}c^{4}x^{5}+35\,a^{2}c^{4}x^{3}+35\,c^{4}x}{280\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="maxima")
```

```
[Out] 1/8*(a^2*c*x^2 + c)^4*arctan(a*x)/(a^2*c) - 1/280*(5*a^6*c^4*x^7 + 21*a^4*c
^4*x^5 + 35*a^2*c^4*x^3 + 35*c^4*x)/(a*c)
```

mupad [B] time = 0.41, size = 100, normalized size = 1.35

$$\mathrm{atan}\left(a\,x\right)\,\left(\frac{a^6\,c^3\,x^8}{8}+\frac{a^4\,c^3\,x^6}{2}+\frac{3\,a^2\,c^3\,x^4}{4}+\frac{c^3\,x^2}{2}\right)-\frac{c^3\,x}{8\,a}-\frac{a\,c^3\,x^3}{8}+\frac{c^3\,\mathrm{atan}\left(a\,x\right)}{8\,a^2}-\frac{3\,a^3\,c^3\,x^5}{40}-\frac{a^5\,c^3\,x^7}{56}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)*(c + a^2*c*x^2)^3,x)
```

```
[Out] atan(a*x)*((c^3*x^2)/2 + (3*a^2*c^3*x^4)/4 + (a^4*c^3*x^6)/2 + (a^6*c^3*x^8
)/8) - (c^3*x)/(8*a) - (a*c^3*x^3)/8 + (c^3*atan(a*x))/(8*a^2) - (3*a^3*c^3
*x^5)/40 - (a^5*c^3*x^7)/56
```

sympy [A] time = 2.43, size = 124, normalized size = 1.68

$$\begin{cases} \frac{a^6c^3x^8\operatorname{atan}(ax)}{8} - \frac{a^5c^3x^7}{56} + \frac{a^4c^3x^6\operatorname{atan}(ax)}{2} - \frac{3a^3c^3x^5}{40} + \frac{3a^2c^3x^4\operatorname{atan}(ax)}{4} - \frac{ac^3x^3}{8} + \frac{c^3x^2\operatorname{atan}(ax)}{2} - \frac{c^3x}{8a} + \frac{c^3\operatorname{atan}(ax)}{8a^2} & \text{for } a \neq \\ 0 & \text{other} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3*atan(a*x),x)
```

```
[Out] Piecewise((a**6*c**3*x**8*atan(a*x)/8 - a**5*c**3*x**7/56 + a**4*c**3*x**6*
atan(a*x)/2 - 3*a**3*c**3*x**5/40 + 3*a**2*c**3*x**4*atan(a*x)/4 - a*c**3*x
**3/8 + c**3*x**2*atan(a*x)/2 - c**3*x/(8*a) + c**3*atan(a*x)/(8*a**2), Ne(
a, 0)), (0, True))
```

3.168 $\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)\,dx$

Optimal. Leaf size=161

$$-\frac{c^3\left(a^2x^2+1\right)^3}{42a}-\frac{3c^3\left(a^2x^2+1\right)^2}{70a}-\frac{4c^3\left(a^2x^2+1\right)}{35a}-\frac{8c^3\log\left(a^2x^2+1\right)}{35a}+\frac{1}{7}c^3x\left(a^2x^2+1\right)^3\tan^{-1}(ax)+\frac{6}{35}c^3x\left(a^2x^2+\right.$$

```
[Out] -4/35*c^3*(a^2*x^2+1)/a-3/70*c^3*(a^2*x^2+1)^2/a-1/42*c^3*(a^2*x^2+1)^3/a+1
6/35*c^3*x*arctan(a*x)+8/35*c^3*x*(a^2*x^2+1)*arctan(a*x)+6/35*c^3*x*(a^2*x
^2+1)^2*arctan(a*x)+1/7*c^3*x*(a^2*x^2+1)^3*arctan(a*x)-8/35*c^3*ln(a^2*x^2
+1)/a
```

Rubi [A] time = 0.08, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}} = 0.176$, Rules used = {4878, 4846, 260}

$$-\frac{c^3\left(a^2x^2+1\right)^3}{42a}-\frac{3c^3\left(a^2x^2+1\right)^2}{70a}-\frac{4c^3\left(a^2x^2+1\right)}{35a}-\frac{8c^3\log\left(a^2x^2+1\right)}{35a}+\frac{1}{7}c^3x\left(a^2x^2+1\right)^3\tan^{-1}(ax)+\frac{6}{35}c^3x\left(a^2x^2+\right.$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] (-4*c^3*(1 + a^2*x^2))/(35*a) - (3*c^3*(1 + a^2*x^2)^2)/(70*a) - (c^3*(1 +
a^2*x^2)^3)/(42*a) + (16*c^3*x*ArcTan[a*x])/35 + (8*c^3*x*(1 + a^2*x^2)*Arc
Tan[a*x])/35 + (6*c^3*x*(1 + a^2*x^2)^2*ArcTan[a*x])/35 + (c^3*x*(1 + a^2*x
^2)^3*ArcTan[a*x])/7 - (8*c^3*Log[1 + a^2*x^2])/(35*a)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^3\tan^{-1}(ax)\,dx = -\frac{c^3\left(1+a^2x^2\right)^3}{42a}+\frac{1}{7}c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)+\frac{1}{7}(6c)\int \left(c+a^2cx^2\right)^2\tan^{-1}(ax$$
$$= -\frac{3c^3\left(1+a^2x^2\right)^2}{70a}-\frac{c^3\left(1+a^2x^2\right)^3}{42a}+\frac{6}{35}c^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)+\frac{1}{7}c^3x\left(1+a\right.$$
$$= -\frac{4c^3\left(1+a^2x^2\right)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{70a}-\frac{c^3\left(1+a^2x^2\right)^3}{42a}+\frac{8}{35}c^3x\left(1+a^2x^2\right)\tan^{-1}(a$$
$$= -\frac{4c^3\left(1+a^2x^2\right)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{70a}-\frac{c^3\left(1+a^2x^2\right)^3}{42a}+\frac{16}{35}c^3x\tan^{-1}(ax)+\frac{8}{35}c^3$$
$$= -\frac{4c^3\left(1+a^2x^2\right)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{70a}-\frac{c^3\left(1+a^2x^2\right)^3}{42a}+\frac{16}{35}c^3x\tan^{-1}(ax)+\frac{8}{35}c^3$$

Mathematica [A] time = 0.08, size = 83, normalized size = 0.52

$$\frac{c^3\left(-48\log\left(a^2x^2+1\right)-a^2x^2\left(5a^4x^4+24a^2x^2+57\right)+6ax\left(5a^6x^6+21a^4x^4+35a^2x^2+35\right)\tan^{-1}(ax)\right)}{210a}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] (c^3*(-(a^2*x^2*(57 + 24*a^2*x^2 + 5*a^4*x^4)) + 6*a*x*(35 + 35*a^2*x^2 + 2
1*a^4*x^4 + 5*a^6*x^6)*ArcTan[a*x] - 48*Log[1 + a^2*x^2]))/(210*a)
```

fricas [A] time = 0.57, size = 101, normalized size = 0.63

$$-\frac{5\,a^6c^3x^6+24\,a^4c^3x^4+57\,a^2c^3x^2+48\,c^3\log\left(a^2x^2+1\right)-6\left(5\,a^7c^3x^7+21\,a^5c^3x^5+35\,a^3c^3x^3+35\,ac^3x\right)\mathrm{arct}}{210\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/210*(5*a^6*c^3*x^6 + 24*a^4*c^3*x^4 + 57*a^2*c^3*x^2 + 48*c^3*log(a^2*x^
2 + 1) - 6*(5*a^7*c^3*x^7 + 21*a^5*c^3*x^5 + 35*a^3*c^3*x^3 + 35*a*c^3*x)*a
rctan(a*x))/a
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.02, size = 104, normalized size = 0.65

$$\frac{a^6c^3\arctan(ax)\,x^7}{7}+\frac{3a^4c^3\arctan(ax)\,x^5}{5}+a^2c^3\arctan(ax)\,x^3+c^3x\arctan(ax)-\frac{a^5c^3x^6}{42}-\frac{4a^3c^3x^4}{35}-\frac{19a\,c^3x^2}{70}-\frac{8}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x),x)
```

```
[Out] 1/7*a^6*c^3*arctan(a*x)*x^7+3/5*a^4*c^3*arctan(a*x)*x^5+a^2*c^3*arctan(a*x)
*x^3+c^3*x*arctan(a*x)-1/42*a^5*c^3*x^6-4/35*a^3*c^3*x^4-19/70*a*c^3*x^2-8/
35*c^3*ln(a^2*x^2+1)/a
```

maxima [A] time = 0.32, size = 99, normalized size = 0.61

$$-\frac{1}{210}\left(5\,a^4c^3x^6+24\,a^2c^3x^4+57\,c^3x^2+\frac{48\,c^3\log\left(a^2x^2+1\right)}{a^2}\right)a+\frac{1}{35}\left(5\,a^6c^3x^7+21\,a^4c^3x^5+35\,a^2c^3x^3+35\,c^3x\right)\mathrm{a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/210*(5*a^4*c^3*x^6 + 24*a^2*c^3*x^4 + 57*c^3*x^2 + 48*c^3*log(a^2*x^2 +
1)/a^2)*a + 1/35*(5*a^6*c^3*x^7 + 21*a^4*c^3*x^5 + 35*a^2*c^3*x^3 + 35*c^3*
x)*arctan(a*x)
```

mupad [B] time = 0.25, size = 89, normalized size = 0.55

$$-\frac{c^3\,\left(48\,\ln\left(a^2\,x^2+1\right)+57\,a^2\,x^2+24\,a^4\,x^4+5\,a^6\,x^6-210\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right)-126\,a^5\,x^5\,\mathrm{atan}\left(a\,x\right)-30\,a^7\,x^7\,\mathrm{atan}\left(\right.\right.}{210\,a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)*(c + a^2*c*x^2)^3,x)
```

```
[Out] -(c^3*(48*log(a^2*x^2 + 1) + 57*a^2*x^2 + 24*a^4*x^4 + 5*a^6*x^6 - 210*a^3*
x^3*atan(a*x) - 126*a^5*x^5*atan(a*x) - 30*a^7*x^7*atan(a*x) - 210*a*x*atan
(a*x)))/(210*a)
```

sympy [A] time = 1.91, size = 117, normalized size = 0.73

$$\begin{cases}\frac{a^6c^3x^7\,\mathrm{atan}\,(ax)}{7}-\frac{a^5c^3x^6}{42}+\frac{3a^4c^3x^5\,\mathrm{atan}\,(ax)}{5}-\frac{4a^3c^3x^4}{35}+a^2c^3x^3\,\mathrm{atan}\,(ax)-\frac{19ac^3x^2}{70}+c^3x\,\mathrm{atan}\,(ax)-\frac{8c^3\log\left(x^2+\frac{1}{a^2}\right)}{35a} & \text{for}\ \\ 0 & \text{oth}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x),x)
```

```
[Out] Piecewise((a**6*c**3*x**7*atan(a*x)/7 - a**5*c**3*x**6/42 + 3*a**4*c**3*x**
5*atan(a*x)/5 - 4*a**3*c**3*x**4/35 + a**2*c**3*x**3*atan(a*x) - 19*a*c**3*
x**2/70 + c**3*x*atan(a*x) - 8*c**3*log(x**2 + a**(-2))/(35*a), Ne(a, 0)),
(0, True))
```

3.169 $\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)}{x} dx$

Optimal. Leaf size=132

$$\frac{1}{6}a^6c^3x^6 \tan^{-1}(ax)-\frac{1}{30}a^5c^3x^5+\frac{3}{4}a^4c^3x^4 \tan^{-1}(ax)-\frac{7}{36}a^3c^3x^3+\frac{3}{2}a^2c^3x^2 \tan^{-1}(ax)+\frac{1}{2}ic^3\text{Li}_2(-iax)-\frac{1}{2}ic^3\text{Li}_2(iax$$

```
[Out] -11/12*a*c^3*x-7/36*a^3*c^3*x^3-1/30*a^5*c^3*x^5+11/12*c^3*arctan(a*x)+3/2*
a^2*c^3*x^2*arctan(a*x)+3/4*a^4*c^3*x^4*arctan(a*x)+1/6*a^6*c^3*x^6*arctan(
a*x)+1/2*I*c^3*polylog(2,-I*a*x)-1/2*I*c^3*polylog(2,I*a*x)
```

Rubi [A] time = 0.15, antiderivative size = 132, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4948, 4848, 2391, 4852, 321, 203, 302}

$$\frac{1}{2}ic^3\text{PolyLog}(2,-iax)-\frac{1}{2}ic^3\text{PolyLog}(2,iax)-\frac{1}{30}a^5c^3x^5-\frac{7}{36}a^3c^3x^3+\frac{1}{6}a^6c^3x^6 \tan^{-1}(ax)+\frac{3}{4}a^4c^3x^4 \tan^{-1}(ax)+\frac{3}{2}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x])/x,x]
```

```
[Out] (-11*a*c^3*x)/12 - (7*a^3*c^3*x^3)/36 - (a^5*c^3*x^5)/30 + (11*c^3*ArcTan[a
*x])/12 + (3*a^2*c^3*x^2*ArcTan[a*x])/2 + (3*a^4*c^3*x^4*ArcTan[a*x])/4 + (
a^6*c^3*x^6*ArcTan[a*x])/6 + (I/2)*c^3*PolyLog[2, (-I)*a*x] - (I/2)*c^3*Pol
yLog[2, I*a*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}{x}\,dx = \int \left(\frac{c^3\tan^{-1}(ax)}{x}+3a^2c^3x\tan^{-1}(ax)+3a^4c^3x^3\tan^{-1}(ax)+a^6c^3x^5\tan^{-1}(ax)\right)dx$$

$$= c^3\int \frac{\tan^{-1}(ax)}{x}\,dx+\left(3a^2c^3\right)\int x\tan^{-1}(ax)\,dx+\left(3a^4c^3\right)\int x^3\tan^{-1}(ax)\,dx+\left(a^6\right.$$

$$= \frac{3}{2}a^2c^3x^2\tan^{-1}(ax)+\frac{3}{4}a^4c^3x^4\tan^{-1}(ax)+\frac{1}{6}a^6c^3x^6\tan^{-1}(ax)+\frac{1}{2}\left(ic^3\right)\int \frac{\log(1-}{x}$$

$$= -\frac{3}{2}ac^3x+\frac{3}{2}a^2c^3x^2\tan^{-1}(ax)+\frac{3}{4}a^4c^3x^4\tan^{-1}(ax)+\frac{1}{6}a^6c^3x^6\tan^{-1}(ax)+\frac{1}{2}ic^3\mathrm{Li}_2$$

$$= -\frac{11}{12}ac^3x-\frac{7}{36}a^3c^3x^3-\frac{1}{30}a^5c^3x^5+\frac{3}{2}c^3\tan^{-1}(ax)+\frac{3}{2}a^2c^3x^2\tan^{-1}(ax)+\frac{3}{4}a^4c^3x$$

$$= -\frac{11}{12}ac^3x-\frac{7}{36}a^3c^3x^3-\frac{1}{30}a^5c^3x^5+\frac{11}{12}c^3\tan^{-1}(ax)+\frac{3}{2}a^2c^3x^2\tan^{-1}(ax)+\frac{3}{4}a^4c^3$$

Mathematica [A] time = 0.05, size = 132, normalized size = 1.00

$$\frac{1}{6}a^6c^3x^6\tan^{-1}(ax)-\frac{1}{30}a^5c^3x^5+\frac{3}{4}a^4c^3x^4\tan^{-1}(ax)-\frac{7}{36}a^3c^3x^3+\frac{3}{2}a^2c^3x^2\tan^{-1}(ax)+\frac{1}{2}ic^3\mathrm{Li}_2(-iax)-\frac{1}{2}ic^3\mathrm{Li}_2(iax)-\frac{1}{1}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x])/x,x]
```

```
[Out] (-11*a*c^3*x)/12 - (7*a^3*c^3*x^3)/36 - (a^5*c^3*x^5)/30 + (11*c^3*ArcTan[a
*x])/12 + (3*a^2*c^3*x^2*ArcTan[a*x])/2 + (3*a^4*c^3*x^4*ArcTan[a*x])/4 + (
a^6*c^3*x^6*ArcTan[a*x])/6 + (I/2)*c^3*PolyLog[2, (-I)*a*x] - (I/2)*c^3*Pol
yLog[2, I*a*x]
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)/x,
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 161, normalized size = 1.22

$$\frac{a^6c^3x^6\arctan(ax)}{6}+\frac{3a^4c^3x^4\arctan(ax)}{4}+\frac{3a^2c^3x^2\arctan(ax)}{2}+c^3\arctan(ax)\ln(ax)-\frac{a^5c^3x^5}{30}-\frac{7a^3c^3x^3}{36}-\frac{11ac}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)/x,x)
```

```
[Out] 1/6*a^6*c^3*x^6*arctan(a*x)+3/4*a^4*c^3*x^4*arctan(a*x)+3/2*a^2*c^3*x^2*arc
tan(a*x)+c^3*arctan(a*x)*ln(a*x)-1/30*a^5*c^3*x^5-7/36*a^3*c^3*x^3-11/12*a*
c^3*x+11/12*c^3*arctan(a*x)+1/2*I*c^3*ln(a*x)*ln(1+I*a*x)-1/2*I*c^3*ln(a*x)
*ln(1-I*a*x)+1/2*I*c^3*dilog(1+I*a*x)-1/2*I*c^3*dilog(1-I*a*x)
```

maxima [A] time = 0.47, size = 127, normalized size = 0.96

$$-\frac{1}{30}a^5c^3x^5-\frac{7}{36}a^3c^3x^3-\frac{11}{12}ac^3x-\frac{1}{4}\pi c^3\log\left(a^2x^2+1\right)+c^3\arctan(ax)\log(ax)-\frac{1}{2}ic^3\mathrm{Li}_2(iax+1)+\frac{1}{2}ic^3\mathrm{Li}_2(-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x,x, algorithm="maxima")
```

```
[Out] -1/30*a^5*c^3*x^5 - 7/36*a^3*c^3*x^3 - 11/12*a*c^3*x - 1/4*pi*c^3*log(a^2*x
^2 + 1) + c^3*arctan(a*x)*log(a*x) - 1/2*I*c^3*dilog(I*a*x + 1) + 1/2*I*c^3
*dilog(-I*a*x + 1) + 1/12*(2*a^6*c^3*x^6 + 9*a^4*c^3*x^4 + 18*a^2*c^3*x^2 +
 11*c^3)*arctan(a*x)
```

mupad [B] time = 0.67, size = 156, normalized size = 1.18

$$\begin{cases} 0 \\ 3a^2c^3\,\mathrm{atan}(ax)\left(\frac{1}{2a^2}+\frac{x^2}{2}\right)-\frac{a^5c^3\left(\frac{x}{a^4}-\frac{\mathrm{atan}(ax)}{a^5}+\frac{x^5}{5}-\frac{x^3}{3a^2}\right)}{6}-\frac{3ac^3x}{2}-\frac{c^3\left(3\,\mathrm{atan}(ax)-3ax+a^3x^3\right)}{4}+\frac{3a^4c^3x^4\,\mathrm{atan}(ax)}{4}+\frac{a^6}{} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^3)/x,x)
```

```
[Out] piecewise(a == 0, 0, a ~= 0, - (c^3*dilog(- a*x*1i + 1)*1i)/2 + (c^3*dilog(
a*x*1i + 1)*1i)/2 - (c^3*(3*atan(a*x) - 3*a*x + a^3*x^3))/4 - (a^5*c^3*(x/a
^4 - atan(a*x)/a^5 + x^5/5 - x^3/(3*a^2)))/6 - (3*a*c^3*x)/2 + 3*a^2*c^3*at
an(a*x)*(1/(2*a^2) + x^2/2) + (3*a^4*c^3*x^4*atan(a*x))/4 + (a^6*c^3*x^6*at
an(a*x))/6)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int\frac{\mathrm{atan}(ax)}{x}\,dx+\int 3a^2x\,\mathrm{atan}(ax)\,dx+\int 3a^4x^3\,\mathrm{atan}(ax)\,dx+\int a^6x^5\,\mathrm{atan}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)/x,x)
```

```
[Out] c**3*(Integral(atan(a*x)/x, x) + Integral(3*a**2*x*atan(a*x), x) + Integral
(3*a**4*x**3*atan(a*x), x) + Integral(a**6*x**5*atan(a*x), x))
```

3.170 $\int \frac{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}{x^2}\,dx$

Optimal. Leaf size=108

$$\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)-\frac{1}{20}a^5c^3x^4+a^4c^3x^3\tan^{-1}(ax)-\frac{2}{5}a^3c^3x^2-\frac{8}{5}ac^3\log\left(a^2x^2+1\right)+3a^2c^3x\tan^{-1}(ax)+ac^3\log(x)-\frac{c^3}{}$$

```
[Out] -2/5*a^3*c^3*x^2-1/20*a^5*c^3*x^4-c^3*arctan(a*x)/x+3*a^2*c^3*x*arctan(a*x)
+a^4*c^3*x^3*arctan(a*x)+1/5*a^6*c^3*x^5*arctan(a*x)+a*c^3*ln(x)-8/5*a*c^3*
ln(a^2*x^2+1)
```

Rubi [A] time = 0.16, antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {4948, 4846, 260, 4852, 266, 36, 29, 31, 43}

$$-\frac{1}{20}a^5c^3x^4-\frac{2}{5}a^3c^3x^2-\frac{8}{5}ac^3\log\left(a^2x^2+1\right)+\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)+a^4c^3x^3\tan^{-1}(ax)+3a^2c^3x\tan^{-1}(ax)+ac^3\log(x)-$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x])/x^2,x]
```

```
[Out] (-2*a^3*c^3*x^2)/5 - (a^5*c^3*x^4)/20 - (c^3*ArcTan[a*x])/x + 3*a^2*c^3*x*A
rcTan[a*x] + a^4*c^3*x^3*ArcTan[a*x] + (a^6*c^3*x^5*ArcTan[a*x])/5 + a*c^3*
Log[x] - (8*a*c^3*Log[1 + a^2*x^2])/5
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}{x^2}\,dx = \int \left(3a^2c^3\tan^{-1}(ax)+\frac{c^3\tan^{-1}(ax)}{x^2}+3a^4c^3x^2\tan^{-1}(ax)+a^6c^3x^4\tan^{-1}(ax)\right)d$$
$$= c^3\int \frac{\tan^{-1}(ax)}{x^2}\,dx+\left(3a^2c^3\right)\int \tan^{-1}(ax)\,dx+\left(3a^4c^3\right)\int x^2\tan^{-1}(ax)\,dx+\left(a\right.$$
$$= -\frac{c^3\tan^{-1}(ax)}{x}+3a^2c^3x\tan^{-1}(ax)+a^4c^3x^3\tan^{-1}(ax)+\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)+\left(\right.$$
$$= -\frac{c^3\tan^{-1}(ax)}{x}+3a^2c^3x\tan^{-1}(ax)+a^4c^3x^3\tan^{-1}(ax)+\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)-\frac{3}{2}$$
$$= -\frac{c^3\tan^{-1}(ax)}{x}+3a^2c^3x\tan^{-1}(ax)+a^4c^3x^3\tan^{-1}(ax)+\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)-\frac{3}{2}$$
$$= -\frac{2}{5}a^3c^3x^2-\frac{1}{20}a^5c^3x^4-\frac{c^3\tan^{-1}(ax)}{x}+3a^2c^3x\tan^{-1}(ax)+a^4c^3x^3\tan^{-1}(ax)+$$

Mathematica [A] time = 0.07, size = 78, normalized size = 0.72

$$\frac{c^3\left(4\left(a^6x^6+5a^4x^4+15a^2x^2-5\right)\tan^{-1}(ax)-ax\left(a^4x^4+8a^2x^2+32\log\left(a^2x^2+1\right)-20\log(x)\right)\right)}{20x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x])/x^2,x]
```

```
[Out] (c^3*(4*(-5 + 15*a^2*x^2 + 5*a^4*x^4 + a^6*x^6)*ArcTan[a*x] - a*x*(8*a^2*x^
2 + a^4*x^4 - 20*Log[x] + 32*Log[1 + a^2*x^2])))/(20*x)
```

fricas [A] time = 0.53, size = 97, normalized size = 0.90

$$-\frac{a^5c^3x^5+8\,a^3c^3x^3+32\,ac^3x\log\left(a^2x^2+1\right)-20\,ac^3x\log(x)-4\left(a^6c^3x^6+5\,a^4c^3x^4+15\,a^2c^3x^2-5\,c^3\right)\arctan}{20\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^2,x, algorithm="fricas")
```

```
[Out] -1/20*(a^5*c^3*x^5 + 8*a^3*c^3*x^3 + 32*a*c^3*x*log(a^2*x^2 + 1) - 20*a*c^3
*x*log(x) - 4*(a^6*c^3*x^6 + 5*a^4*c^3*x^4 + 15*a^2*c^3*x^2 - 5*c^3)*arctan
(a*x))/x
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 103, normalized size = 0.95

$$\frac{a^6c^3x^5\arctan(ax)}{5}+a^4c^3x^3\arctan(ax)+3a^2c^3x\arctan(ax)-\frac{c^3\arctan(ax)}{x}-\frac{a^5c^3x^4}{20}-\frac{2a^3c^3x^2}{5}+a\,c^3\ln(ax)-\frac{8a\,c^3\,\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)/x^2,x)
```

```
[Out] 1/5*a^6*c^3*x^5*arctan(a*x)+a^4*c^3*x^3*arctan(a*x)+3*a^2*c^3*x*arctan(a*x)
-c^3*arctan(a*x)/x-1/20*a^5*c^3*x^4-2/5*a^3*c^3*x^2+a*c^3*ln(a*x)-8/5*a*c^3
*ln(a^2*x^2+1)
```

maxima [A] time = 0.33, size = 93, normalized size = 0.86

$$-\frac{1}{20}\left(a^4c^3x^4+8\,a^2c^3x^2+32\,c^3\log\left(a^2x^2+1\right)-20\,c^3\log(x)\right)a+\frac{1}{5}\left(a^6c^3x^5+5\,a^4c^3x^3+15\,a^2c^3x-\frac{5\,c^3}{x}\right)\arctan(a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^2,x, algorithm="maxima")
```

```
[Out] -1/20*(a^4*c^3*x^4 + 8*a^2*c^3*x^2 + 32*c^3*log(a^2*x^2 + 1) - 20*c^3*log(x
))*a + 1/5*(a^6*c^3*x^5 + 5*a^4*c^3*x^3 + 15*a^2*c^3*x - 5*c^3/x)*arctan(a*
x)
```

mupad [B] time = 0.56, size = 85, normalized size = 0.79

$$-\frac{c^3\left(\mathrm{atan}\left(a\,x\right)+\frac{2\,a^3\,x^3}{5}+\frac{a^5\,x^5}{20}-a\,x\,\ln(x)-3\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)-a^4\,x^4\,\mathrm{atan}\left(a\,x\right)-\frac{a^6\,x^6\,\mathrm{atan}(a\,x)}{5}+\frac{8\,a\,x\,\ln\left(a^2\,x^2+1\right)}{5}\right)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^3)/x^2,x)
```

```
[Out] -(c^3*(atan(a*x) + (2*a^3*x^3)/5 + (a^5*x^5)/20 - a*x*log(x) - 3*a^2*x^2*at
an(a*x) - a^4*x^4*atan(a*x) - (a^6*x^6*atan(a*x))/5 + (8*a*x*log(a^2*x^2 +
1))/5))/x
```

sympy [A] time = 2.24, size = 110, normalized size = 1.02

$$\begin{cases}\frac{a^6c^3x^5\,\mathrm{atan}\,(ax)}{5}-\frac{a^5c^3x^4}{20}+a^4c^3x^3\,\mathrm{atan}\,(ax)-\frac{2a^3c^3x^2}{5}+3a^2c^3x\,\mathrm{atan}\,(ax)+ac^3\log(x)-\frac{8ac^3\log\left(x^2+\frac{1}{a^2}\right)}{5}-\frac{c^3\,\mathrm{atan}\,(ax)}{x}\\0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)/x**2,x)
```

```
[Out] Piecewise((a**6*c**3*x**5*atan(a*x)/5 - a**5*c**3*x**4/20 + a**4*c**3*x**3*
atan(a*x) - 2*a**3*c**3*x**2/5 + 3*a**2*c**3*x*atan(a*x) + a*c**3*log(x) -
8*a*c**3*log(x**2 + a**(-2))/5 - c**3*atan(a*x)/x, Ne(a, 0)), (0, True))
```

3.171 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)}{x^3} dx$

Optimal. Leaf size=138

$$\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)-\frac{1}{12}a^5c^3x^3+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)-\frac{5}{4}a^3c^3x+\frac{3}{2}ia^2c^3\text{Li}_2(-iax)-\frac{3}{2}ia^2c^3\text{Li}_2(iax)+\frac{3}{4}a^2c^3\tan^{-1}(ax)-\frac{c}{}$$

```
[Out] -1/2*a*c^3/x-5/4*a^3*c^3*x-1/12*a^5*c^3*x^3+3/4*a^2*c^3*arctan(a*x)-1/2*c^3
*arctan(a*x)/x^2+3/2*a^4*c^3*x^2*arctan(a*x)+1/4*a^6*c^3*x^4*arctan(a*x)+3/
2*I*a^2*c^3*polylog(2,-I*a*x)-3/2*I*a^2*c^3*polylog(2,I*a*x)
```

Rubi [A] time = 0.15, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4948, 4852, 325, 203, 4848, 2391, 321, 302}

$$\frac{3}{2}ia^2c^3\text{PolyLog}(2,-iax)-\frac{3}{2}ia^2c^3\text{PolyLog}(2,iax)-\frac{1}{12}a^5c^3x^3+\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)-\frac{5}{4}a^3c^3x+\frac{3}{4}a$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x])/x^3,x]
```

```
[Out] -(a*c^3)/(2*x) - (5*a^3*c^3*x)/4 - (a^5*c^3*x^3)/12 + (3*a^2*c^3*ArcTan[a*x
])/4 - (c^3*ArcTan[a*x])/(2*x^2) + (3*a^4*c^3*x^2*ArcTan[a*x])/2 + (a^6*c^3
*x^4*ArcTan[a*x])/4 + ((3*I)/2)*a^2*c^3*PolyLog[2, (-I)*a*x] - ((3*I)/2)*a^
2*c^3*PolyLog[2, I*a*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)}{x^3}\,dx &= \int \left(\frac{c^3\tan^{-1}(ax)}{x^3}+\frac{3a^2c^3\tan^{-1}(ax)}{x}+3a^4c^3x\tan^{-1}(ax)+a^6c^3x^3\tan^{-1}(ax)\right) d\\
&= c^3\int \frac{\tan^{-1}(ax)}{x^3}\,dx+\left(3a^2c^3\right)\int \frac{\tan^{-1}(ax)}{x}\,dx+\left(3a^4c^3\right)\int x\tan^{-1}(ax)\,dx+\left(a\right.\\
&= -\frac{c^3\tan^{-1}(ax)}{2x^2}+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)+\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)+\frac{1}{2}\left(ac^3\right)\int \frac{1}{x^2\left(1+\right.}\\
&= -\frac{ac^3}{2x}-\frac{3}{2}a^3c^3x-\frac{c^3\tan^{-1}(ax)}{2x^2}+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)+\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)+\frac{3}{2}i\\
&= -\frac{ac^3}{2x}-\frac{5}{4}a^3c^3x-\frac{1}{12}a^5c^3x^3+a^2c^3\tan^{-1}(ax)-\frac{c^3\tan^{-1}(ax)}{2x^2}+\frac{3}{2}a^4c^3x^2\tan^{-1}(\\
&= -\frac{ac^3}{2x}-\frac{5}{4}a^3c^3x-\frac{1}{12}a^5c^3x^3+\frac{3}{4}a^2c^3\tan^{-1}(ax)-\frac{c^3\tan^{-1}(ax)}{2x^2}+\frac{3}{2}a^4c^3x^2\tan^{-1}
\end{aligned}
$$

Mathematica [C] time = 0.04, size = 154, normalized size = 1.12

$$
\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)-\frac{1}{12}a^5c^3x^3+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)-\frac{5}{4}a^3c^3x-\frac{ac^3\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-a^2x^2\right)}{2x}+\frac{3}{2}ia^2c^3\mathrm{Li}_2(-iax)-\frac{3}{2}ia^2c^3
$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x])/x^3,x]
```

```
[Out] (-5*a^3*c^3*x)/4 - (a^5*c^3*x^3)/12 + (5*a^2*c^3*ArcTan[a*x])/4 - (c^3*ArcT
an[a*x])/(2*x^2) + (3*a^4*c^3*x^2*ArcTan[a*x])/2 + (a^6*c^3*x^4*ArcTan[a*x]
)/4 - (a*c^3*Hypergeometric2F1[-1/2, 1, 1/2, -(a^2*x^2)])/(2*x) + ((3*I)/2)
*a^2*c^3*PolyLog[2, (-I)*a*x] - ((3*I)/2)*a^2*c^3*PolyLog[2, I*a*x]
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$
\mathrm{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)}{x^3},x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)/x^
3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 177, normalized size = 1.28

$$\frac{a^6c^3x^4\arctan(ax)}{4}+\frac{3a^4c^3x^2\arctan(ax)}{2}+3a^2c^3\arctan(ax)\ln(ax)-\frac{c^3\arctan(ax)}{2x^2}-\frac{a^5c^3x^3}{12}-\frac{5a^3c^3x}{4}-\frac{a\,c^3}{2x}+\frac{3a^2c^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)/x^3,x)
```

```
[Out] 1/4*a^6*c^3*x^4*arctan(a*x)+3/2*a^4*c^3*x^2*arctan(a*x)+3*a^2*c^3*arctan(a*
x)*ln(a*x)-1/2*c^3*arctan(a*x)/x^2-1/12*a^5*c^3*x^3-5/4*a^3*c^3*x-1/2*a*c^3
/x+3/4*a^2*c^3*arctan(a*x)+3/2*I*a^2*c^3*ln(a*x)*ln(1+I*a*x)-3/2*I*a^2*c^3*
ln(a*x)*ln(1-I*a*x)+3/2*I*a^2*c^3*dilog(1+I*a*x)-3/2*I*a^2*c^3*dilog(1-I*a*
x)
```

maxima [A] time = 0.49, size = 155, normalized size = 1.12

$$-\frac{a^5c^3x^5+15\,a^3c^3x^3+9\,\pi a^2c^3x^2\log\left(a^2x^2+1\right)-36\,a^2c^3x^2\arctan(ax)\log(ax)+18i\,a^2c^3x^2\mathrm{Li}_2\,(i\,ax+1)-18i\,a^2}{12\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^3,x, algorithm="maxima")
```

```
[Out] -1/12*(a^5*c^3*x^5 + 15*a^3*c^3*x^3 + 9*pi*a^2*c^3*x^2*log(a^2*x^2 + 1) - 3
6*a^2*c^3*x^2*arctan(a*x)*log(a*x) + 18*I*a^2*c^3*x^2*dilog(I*a*x + 1) - 18
*I*a^2*c^3*x^2*dilog(-I*a*x + 1) + 6*a*c^3*x - 3*(a^6*c^3*x^6 + 6*a^4*c^3*x
^4 + 3*a^2*c^3*x^2 - 2*c^3)*arctan(a*x))/x^2
```

mupad [B] time = 0.57, size = 152, normalized size = 1.10

$$\begin{cases} 0 \\ 3\,a^4\,c^3\,\mathrm{atan}\,(a\,x)\left(\frac{1}{2\,a^2}+\frac{x^2}{2}\right)-\frac{a^2\,c^3\left(3\,\mathrm{atan}(a\,x)-3\,a\,x+a^3\,x^3\right)}{12}-\frac{c^3\,\mathrm{atan}(a\,x)}{2\,x^2}-\frac{c^3\left(a^3\,\mathrm{atan}(a\,x)+\frac{a^2}{x}\right)}{2\,a}-\frac{3\,a^3\,c^3\,x}{2}+\frac{a^6\,c^3\,x^4\,\mathrm{atan}(a\,x)}{4}- \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^3)/x^3,x)
```

```
[Out] piecewise(a == 0, 0, a ~= 0, - (3*a^3*c^3*x)/2 - (a^2*c^3*(3*atan(a*x) - 3*
a*x + a^3*x^3))/12 - (c^3*atan(a*x))/(2*x^2) - (a^2*c^3*dilog(- a*x*1i + 1)
*3i)/2 + (a^2*c^3*dilog(a*x*1i + 1)*3i)/2 - (c^3*(a^3*atan(a*x) + a^2/x))/(
2*a) + 3*a^4*c^3*atan(a*x)*(1/(2*a^2) + x^2/2) + (a^6*c^3*x^4*atan(a*x))/4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{\operatorname{atan}(ax)}{x^{3}}\,dx+\int \frac{3a^{2}\operatorname{atan}(ax)}{x}\,dx+\int 3a^{4}x\operatorname{atan}(ax)\,dx+\int a^{6}x^{3}\operatorname{atan}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)/x**3,x)
```

```
[Out] c**3*(Integral(atan(a*x)/x**3, x) + Integral(3*a**2*atan(a*x)/x, x) + Integ
ral(3*a**4*x*atan(a*x), x) + Integral(a**6*x**3*atan(a*x), x))
```

3.172 $\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)}{x^4} \, dx$

Optimal. Leaf size=116

$$\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)-\frac{1}{6}a^5c^3x^2+3a^4c^3x\tan^{-1}(ax)+\frac{8}{3}a^3c^3\log(x)-\frac{3a^2c^3\tan^{-1}(ax)}{x}-\frac{8}{3}a^3c^3\log\left(a^2x^2+1\right)-\frac{c^3\tan^{-1}(a$$

```
[Out] -1/6*a*c^3/x^2-1/6*a^5*c^3*x^2-1/3*c^3*arctan(a*x)/x^3-3*a^2*c^3*arctan(a*x
)/x+3*a^4*c^3*x*arctan(a*x)+1/3*a^6*c^3*x^3*arctan(a*x)+8/3*a^3*c^3*ln(x)-8
/3*a^3*c^3*ln(a^2*x^2+1)
```

Rubi [A] time = 0.16, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4948, 4846, 260, 4852, 266, 44, 36, 29, 31, 43}

$$-\frac{1}{6}a^5c^3x^2-\frac{8}{3}a^3c^3\log\left(a^2x^2+1\right)+\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)+\frac{8}{3}a^3c^3\log(x)+3a^4c^3x\tan^{-1}(ax)-\frac{3a^2c^3\tan^{-1}(ax)}{x}-\frac{ac^3}{6x^2}-\frac{c^3 t$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x])/x^4,x]
```

```
[Out] -(a*c^3)/(6*x^2) - (a^5*c^3*x^2)/6 - (c^3*ArcTan[a*x])/(3*x^3) - (3*a^2*c^3
*ArcTan[a*x])/x + 3*a^4*c^3*x*ArcTan[a*x] + (a^6*c^3*x^3*ArcTan[a*x])/3 + (
8*a^3*c^3*Log[x])/3 - (8*a^3*c^3*Log[1 + a^2*x^2])/3
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)}{x^4}\,dx &= \int \left(3a^4c^3\tan^{-1}(ax)+\frac{c^3\tan^{-1}(ax)}{x^4}+\frac{3a^2c^3\tan^{-1}(ax)}{x^2}+a^6c^3x^2\tan^{-1}(ax)\right)dx\\
&= c^3\int \frac{\tan^{-1}(ax)}{x^4}\,dx+\left(3a^2c^3\right)\int \frac{\tan^{-1}(ax)}{x^2}\,dx+\left(3a^4c^3\right)\int \tan^{-1}(ax)\,dx+\left(a^6c\right.\\
&= -\frac{c^3\tan^{-1}(ax)}{3x^3}-\frac{3a^2c^3\tan^{-1}(ax)}{x}+3a^4c^3x\tan^{-1}(ax)+\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)+\frac{1}{3}\\
&= -\frac{c^3\tan^{-1}(ax)}{3x^3}-\frac{3a^2c^3\tan^{-1}(ax)}{x}+3a^4c^3x\tan^{-1}(ax)+\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)-\frac{3}{2}\\
&= -\frac{c^3\tan^{-1}(ax)}{3x^3}-\frac{3a^2c^3\tan^{-1}(ax)}{x}+3a^4c^3x\tan^{-1}(ax)+\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)-\frac{3}{2}\\
&= -\frac{ac^3}{6x^2}-\frac{1}{6}a^5c^3x^2-\frac{c^3\tan^{-1}(ax)}{3x^3}-\frac{3a^2c^3\tan^{-1}(ax)}{x}+3a^4c^3x\tan^{-1}(ax)+\frac{1}{3}a^6c
\end{aligned}$$

Mathematica [A] time = 0.07, size = 83, normalized size = 0.72

$$\frac{c^3\left(2\left(a^6x^6+9a^4x^4-9a^2x^2-1\right)\tan^{-1}(ax)-ax\left(a^4x^4-16a^2x^2\log(x)+16a^2x^2\log\left(a^2x^2+1\right)+1\right)\right)}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x])/x^4,x]
```

```
[Out] (c^3*(2*(-1 - 9*a^2*x^2 + 9*a^4*x^4 + a^6*x^6)*ArcTan[a*x] - a*x*(1 + a^4*x
^4 - 16*a^2*x^2*Log[x] + 16*a^2*x^2*Log[1 + a^2*x^2])))/(6*x^3)
```

fricas [A] time = 0.50, size = 100, normalized size = 0.86

$$-\frac{a^{5} c^{3} x^{5} + 16 \, a^{3} c^{3} x^{3} \log\left(a^{2} x^{2} + 1\right) - 16 \, a^{3} c^{3} x^{3} \log(x) + a c^{3} x - 2 \, {\left(a^{6} c^{3} x^{6} + 9 \, a^{4} c^{3} x^{4} - 9 \, a^{2} c^{3} x^{2} - c^{3}\right)} \arctan\left(a x\right)}{6 \, x^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^4,x, algorithm="fricas")
```

```
[Out] -1/6*(a^5*c^3*x^5 + 16*a^3*c^3*x^3*log(a^2*x^2 + 1) - 16*a^3*c^3*x^3*log(x)
 + a*c^3*x - 2*(a^6*c^3*x^6 + 9*a^4*c^3*x^4 - 9*a^2*c^3*x^2 - c^3)*arctan(a
*x))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 107, normalized size = 0.92

$$\frac{a^{6} c^{3} x^{3} \arctan \left(a x \right)}{3}+3 a^{4} c^{3} x \arctan \left(a x \right)-\frac{c^{3} \arctan \left(a x \right)}{3 x^{3}}-\frac{3 a^{2} c^{3} \arctan \left(a x \right)}{x}-\frac{a^{5} c^{3} x^{2}}{6}-\frac{a \,c^{3}}{6 x^{2}}+\frac{8 a^{3} c^{3} \ln \left(a x \right)}{3}-\frac{8 a^{3} c^{3} \ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)/x^4,x)
```

```
[Out] 1/3*a^6*c^3*x^3*arctan(a*x)+3*a^4*c^3*x*arctan(a*x)-1/3*c^3*arctan(a*x)/x^3
-3*a^2*c^3*arctan(a*x)/x-1/6*a^5*c^3*x^2-1/6*a*c^3/x^2+8/3*a^3*c^3*ln(a*x)-
8/3*a^3*c^3*ln(a^2*x^2+1)
```

maxima [A] time = 0.33, size = 96, normalized size = 0.83

$$-\frac{1}{6} \, {\left(a^{4} c^{3} x^{2} + 16 \, a^{2} c^{3} \log\left(a^{2} x^{2} + 1\right) - 16 \, a^{2} c^{3} \log\left(x\right) + \frac{c^{3}}{x^{2}}\right)} a + \frac{1}{3} \, {\left(a^{6} c^{3} x^{3} + 9 \, a^{4} c^{3} x - \frac{9 \, a^{2} c^{3} x^{2} + c^{3}}{x^{3}}\right)} \arctan\left(a x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*(a^4*c^3*x^2 + 16*a^2*c^3*log(a^2*x^2 + 1) - 16*a^2*c^3*log(x) + c^3/x
^2)*a + 1/3*(a^6*c^3*x^3 + 9*a^4*c^3*x - (9*a^2*c^3*x^2 + c^3)/x^3)*arctan(
a*x)
```

mupad [B] time = 0.54, size = 97, normalized size = 0.84

$$-\frac{c^3\,\left(2\,\mathrm{atan}\left(a\,x\right)+a\,x-a^3\,x^3+a^5\,x^5+18\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)-18\,a^4\,x^4\,\mathrm{atan}\left(a\,x\right)-2\,a^6\,x^6\,\mathrm{atan}\left(a\,x\right)+16\,a^3\,x^3\,\ln\left(\right.\right.}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^3)/x^4,x)
```

```
[Out] -(c^3*(2*atan(a*x) + a*x - a^3*x^3 + a^5*x^5 + 18*a^2*x^2*atan(a*x) - 18*a^
4*x^4*atan(a*x) - 2*a^6*x^6*atan(a*x) + 16*a^3*x^3*log(a^2*x^2 + 1) - 16*a^
3*x^3*log(x)))/(6*x^3)
```

sympy [A] time = 2.17, size = 117, normalized size = 1.01

$$\begin{cases} \frac{a^6c^3x^3\operatorname{atan}(ax)}{3} - \frac{a^5c^3x^2}{6} + 3a^4c^3x\operatorname{atan}(ax) + \frac{8a^3c^3\log(x)}{3} - \frac{8a^3c^3\log\left(x^2+\frac{1}{a^2}\right)}{3} - \frac{3a^2c^3\operatorname{atan}(ax)}{x} - \frac{ac^3}{6x^2} - \frac{c^3\operatorname{atan}(ax)}{3x^3} & \text{for } a \\ 0 & \text{othe} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)/x**4,x)
```

```
[Out] Piecewise((a**6*c**3*x**3*atan(a*x)/3 - a**5*c**3*x**2/6 + 3*a**4*c**3*x*at
an(a*x) + 8*a**3*c**3*log(x)/3 - 8*a**3*c**3*log(x**2 + a**(-2))/3 - 3*a**2
*c**3*atan(a*x)/x - a*c**3/(6*x**2) - c**3*atan(a*x)/(3*x**3), Ne(a, 0)), (
0, True))
```

3.173 $\int \frac{x^4 \tan^{-1}(ax)}{c+a^2cx^2} dx$

Optimal. Leaf size=80

$$\frac{\tan^{-1}(ax)^2}{2a^5c} - \frac{x\tan^{-1}(ax)}{a^4c} - \frac{x^2}{6a^3c} + \frac{x^3\tan^{-1}(ax)}{3a^2c} + \frac{2\log\left(a^2x^2+1\right)}{3a^5c}$$

```
[Out] -1/6*x^2/a^3/c-x*arctan(a*x)/a^4/c+1/3*x^3*arctan(a*x)/a^2/c+1/2*arctan(a*x
)^2/a^5/c+2/3*ln(a^2*x^2+1)/a^5/c
```

Rubi [A] time = 0.15, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4916, 4852, 266, 43, 4846, 260, 4884}

$$-\frac{x^2}{6a^3c} + \frac{2\log\left(a^2x^2+1\right)}{3a^5c} + \frac{x^3\tan^{-1}(ax)}{3a^2c} - \frac{x\tan^{-1}(ax)}{a^4c} + \frac{\tan^{-1}(ax)^2}{2a^5c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] -x^2/(6*a^3*c) - (x*ArcTan[a*x])/(a^4*c) + (x^3*ArcTan[a*x])/(3*a^2*c) + Ar
cTan[a*x]^2/(2*a^5*c) + (2*Log[1 + a^2*x^2])/(3*a^5*c)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^4 \tan^{-1}(ax)}{c+a^2cx^2}\,dx &= -\frac{\int \frac{x^2\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^2} + \frac{\int x^2\tan^{-1}(ax)\,dx}{a^2c} \\
&= \frac{x^3\tan^{-1}(ax)}{3a^2c} + \frac{\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^4} - \frac{\int \tan^{-1}(ax)\,dx}{a^4c} - \frac{\int \frac{x^3}{1+a^2x^2}\,dx}{3ac} \\
&= -\frac{x\tan^{-1}(ax)}{a^4c} + \frac{x^3\tan^{-1}(ax)}{3a^2c} + \frac{\tan^{-1}(ax)^2}{2a^5c} + \frac{\int \frac{x}{1+a^2x^2}\,dx}{a^3c} - \frac{\text{Subst}\left(\int \frac{x}{1+a^2x}\,dx, x, x^2\right)}{6ac} \\
&= -\frac{x\tan^{-1}(ax)}{a^4c} + \frac{x^3\tan^{-1}(ax)}{3a^2c} + \frac{\tan^{-1}(ax)^2}{2a^5c} + \frac{\log\left(1+a^2x^2\right)}{2a^5c} - \frac{\text{Subst}\left(\int \left(\frac{1}{a^2} - \frac{1}{a^2\left(1+a^2x\right)}\right)\ldots\right.}{6ac} \\
&= -\frac{x^2}{6a^3c} - \frac{x\tan^{-1}(ax)}{a^4c} + \frac{x^3\tan^{-1}(ax)}{3a^2c} + \frac{\tan^{-1}(ax)^2}{2a^5c} + \frac{2\log\left(1+a^2x^2\right)}{3a^5c}
\end{aligned}
$$

Mathematica [A] time = 0.06, size = 56, normalized size = 0.70

$$
\frac{-a^2x^2 + 4\log\left(a^2x^2+1\right) + 2ax\left(a^2x^2-3\right)\tan^{-1}(ax) + 3\tan^{-1}(ax)^2}{6a^5c}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] (-(a^2*x^2) + 2*a*x*(-3 + a^2*x^2)*ArcTan[a*x] + 3*ArcTan[a*x]^2 + 4*Log[1
+ a^2*x^2])/(6*a^5*c)
```

fricas [A] time = 0.45, size = 54, normalized size = 0.68

$$
-\frac{a^2x^2 - 2\left(a^3x^3 - 3\,ax\right)\arctan\left(ax\right) - 3\,\arctan\left(ax\right)^2 - 4\,\log\left(a^2x^2+1\right)}{6\,a^5c}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] -1/6*(a^2*x^2 - 2*(a^3*x^3 - 3*a*x)*arctan(a*x) - 3*arctan(a*x)^2 - 4*log(a
^2*x^2 + 1))/(a^5*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$
sage_0x
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 73, normalized size = 0.91

$$-\frac{x^{2}}{6a^{3}c}-\frac{x\arctan\left(ax\right)}{a^{4}c}+\frac{x^{3}\arctan\left(ax\right)}{3a^{2}c}+\frac{\arctan\left(ax\right)^{2}}{2a^{5}c}+\frac{2\ln\left(a^{2}x^{2}+1\right)}{3a^{5}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)/(a^2*c*x^2+c),x)
```

```
[Out] -1/6*x^2/a^3/c-x*arctan(a*x)/a^4/c+1/3*x^3*arctan(a*x)/a^2/c+1/2*arctan(a*x
)^2/a^5/c+2/3*ln(a^2*x^2+1)/a^5/c
```

maxima [A] time = 0.43, size = 74, normalized size = 0.92

$$\frac{1}{3}\left(\frac{a^{2}x^{3}-3\,x}{a^{4}c}+\frac{3\,\arctan\left(ax\right)}{a^{5}c}\right)\arctan\left(ax\right)-\frac{a^{2}x^{2}+3\,\arctan\left(ax\right)^{2}-4\,\log\left(a^{2}x^{2}+1\right)}{6\,a^{5}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] 1/3*((a^2*x^3 - 3*x)/(a^4*c) + 3*arctan(a*x)/(a^5*c))*arctan(a*x) - 1/6*(a^
2*x^2 + 3*arctan(a*x)^2 - 4*log(a^2*x^2 + 1))/(a^5*c)
```

mupad [B] time = 0.17, size = 73, normalized size = 0.91

$$\frac{2\,\ln\left(a^{2}\,x^{2}+1\right)}{3\,a^{5}\,c}-a^{2}\,\mathrm{atan}\left(a\,x\right)\,\left(\frac{x}{a^{6}\,c}-\frac{x^{3}}{3\,a^{4}\,c}\right)-\frac{x^{2}}{6\,a^{3}\,c}+\frac{\mathrm{atan}\left(a\,x\right)^{2}}{2\,a^{5}\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x))/(c + a^2*c*x^2),x)
```

```
[Out] (2*log(a^2*x^2 + 1))/(3*a^5*c) - a^2*atan(a*x)*(x/(a^6*c) - x^3/(3*a^4*c))
- x^2/(6*a^3*c) + atan(a*x)^2/(2*a^5*c)
```

sympy [A] time = 1.83, size = 110, normalized size = 1.38

$$\begin{cases}\frac{x^{3}\operatorname{atan}\left(ax\right)}{3a^{2}c}-\frac{x^{2}}{6a^{3}c}-\frac{x\operatorname{atan}\left(ax\right)}{a^{4}c}+\frac{2\log\left(x^{2}+\frac{1}{a^{2}}\right)}{3a^{5}c}+\frac{\operatorname{atan}^{2}\left(ax\right)}{2a^{5}c} & \text{for}\: c\neq 0\\\tilde{\infty}\left(\frac{x^{5}\operatorname{atan}\left(ax\right)}{5}-\frac{x^{4}}{20a}+\frac{x^{2}}{10a^{3}}-\frac{\log\left(a^{2}x^{2}+1\right)}{10a^{5}}\right) & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)/(a**2*c*x**2+c),x)
```

```
[Out] Piecewise((x**3*atan(a*x)/(3*a**2*c) - x**2/(6*a**3*c) - x*atan(a*x)/(a**4*
c) + 2*log(x**2 + a**(-2))/(3*a**5*c) + atan(a*x)**2/(2*a**5*c), Ne(c, 0)),
 (zoo*(x**5*atan(a*x)/5 - x**4/(20*a) + x**2/(10*a**3) - log(a**2*x**2 + 1)
/(10*a**5)), True))
```

3.174 $\int \frac{x^3 \tan^{-1}(ax)}{c+a^2cx^2} dx$

Optimal. Leaf size=113

$$\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{2a^4c}+\frac{i\tan^{-1}(ax)^2}{2a^4c}+\frac{\tan^{-1}(ax)}{2a^4c}+\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^4c}-\frac{x}{2a^3c}+\frac{x^2\tan^{-1}(ax)}{2a^2c}$$

```
[Out] -1/2*x/a^3/c+1/2*arctan(a*x)/a^4/c+1/2*x^2*arctan(a*x)/a^2/c+1/2*I*arctan(a
*x)^2/a^4/c+arctan(a*x)*ln(2/(1+I*a*x))/a^4/c+1/2*I*polylog(2,1-2/(1+I*a*x)
)/a^4/c
```

Rubi [A] time = 0.14, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4916, 4852, 321, 203, 4920, 4854, 2402, 2315}

$$\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^4c}+\frac{x^2\tan^{-1}(ax)}{2a^2c}-\frac{x}{2a^3c}+\frac{i\tan^{-1}(ax)^2}{2a^4c}+\frac{\tan^{-1}(ax)}{2a^4c}+\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^4c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] -x/(2*a^3*c) + ArcTan[a*x]/(2*a^4*c) + (x^2*ArcTan[a*x])/(2*a^2*c) + ((I/2)
*ArcTan[a*x]^2)/(a^4*c) + (ArcTan[a*x]*Log[2/(1 + I*a*x)])/(a^4*c) + ((I/2)
*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^4*c)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)}{c+a^2cx^2}\,dx = -\frac{\int \frac{x\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^2}+\frac{\int x\tan^{-1}(ax)\,dx}{a^2c}$$

$$= \frac{x^2\tan^{-1}(ax)}{2a^2c}+\frac{i\tan^{-1}(ax)^2}{2a^4c}+\frac{\int \frac{\tan^{-1}(ax)}{i-ax}\,dx}{a^3c}-\frac{\int \frac{x^2}{1+a^2x^2}\,dx}{2ac}$$

$$= -\frac{x}{2a^3c}+\frac{x^2\tan^{-1}(ax)}{2a^2c}+\frac{i\tan^{-1}(ax)^2}{2a^4c}+\frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^4c}+\frac{\int \frac{1}{1+a^2x^2}\,dx}{2a^3c}-\frac{\int \frac{\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}\,d}{a^3c}$$

$$= -\frac{x}{2a^3c}+\frac{\tan^{-1}(ax)}{2a^4c}+\frac{x^2\tan^{-1}(ax)}{2a^2c}+\frac{i\tan^{-1}(ax)^2}{2a^4c}+\frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^4c}+\frac{i\,\mathrm{Subst}\left(\int \frac{\log}{1-}\right.}{a}$$

$$= -\frac{x}{2a^3c}+\frac{\tan^{-1}(ax)}{2a^4c}+\frac{x^2\tan^{-1}(ax)}{2a^2c}+\frac{i\tan^{-1}(ax)^2}{2a^4c}+\frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^4c}+\frac{i\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right.}{2a^4c}$$

Mathematica [A] time = 0.03, size = 120, normalized size = 1.06

$$\frac{i\mathrm{Li}_2\left(-\frac{ax+i}{i-ax}\right)}{2a^4c}+\frac{i\tan^{-1}(ax)^2}{2a^4c}+\frac{\tan^{-1}(ax)}{2a^4c}+\frac{\log\left(\frac{2i}{-ax+i}\right)\tan^{-1}(ax)}{a^4c}-\frac{x}{2a^3c}+\frac{x^2\tan^{-1}(ax)}{2a^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] -1/2*x/(a^3*c) + ArcTan[a*x]/(2*a^4*c) + (x^2*ArcTan[a*x])/(2*a^2*c) + ((I/
2)*ArcTan[a*x]^2)/(a^4*c) + (ArcTan[a*x]*Log[(2*I)/(I - a*x)])/(a^4*c) + ((
I/2)*PolyLog[2, -((I + a*x)/(I - a*x))])/(a^4*c)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^3\arctan(ax)}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x^3*arctan(a*x)/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.12, size = 238, normalized size = 2.11

$$\frac{x^2\arctan(ax)}{2a^2c}-\frac{\arctan(ax)\ln\left(a^2x^2+1\right)}{2a^4c}-\frac{x}{2a^3c}+\frac{\arctan(ax)}{2a^4c}-\frac{i\ln(ax-i)\ln\left(a^2x^2+1\right)}{4a^4c}+\frac{i\ln(ax-i)^2}{8a^4c}+\frac{i\,\mathrm{dilo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)/(a^2*c*x^2+c),x)
```

```
[Out] 1/2*x^2*arctan(a*x)/a^2/c-1/2/a^4/c*arctan(a*x)*ln(a^2*x^2+1)-1/2*x/a^3/c+1
/2*arctan(a*x)/a^4/c-1/4*I/a^4/c*ln(a*x-I)*ln(a^2*x^2+1)+1/8*I/a^4/c*ln(a*x
-I)^2+1/4*I/a^4/c*dilog(-1/2*I*(I+a*x))+1/4*I/a^4/c*ln(a*x-I)*ln(-1/2*I*(I+
a*x))+1/4*I/a^4/c*ln(I+a*x)*ln(a^2*x^2+1)-1/8*I/a^4/c*ln(I+a*x)^2-1/4*I/a^4
/c*dilog(1/2*I*(a*x-I))-1/4*I/a^4/c*ln(I+a*x)*ln(1/2*I*(a*x-I))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\arctan(ax)}{a^2cx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)/(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\mathrm{atan}(a\,x)}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^3*atan(a*x))/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3\,\mathrm{atan}(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**3*atan(a*x)/(a**2*x**2 + 1), x)/c
```

3.175 $\int \frac{x^2 \tan^{-1}(ax)}{c+a^2cx^2} \, dx$

Optimal. Leaf size=49

$$-\frac{\tan^{-1}(ax)^2}{2a^3c}+\frac{x\tan^{-1}(ax)}{a^2c}-\frac{\log\left(a^2x^2+1\right)}{2a^3c}$$

```
[Out] x*arctan(a*x)/a^2/c-1/2*arctan(a*x)^2/a^3/c-1/2*ln(a^2*x^2+1)/a^3/c
```

Rubi [A] time = 0.07, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4916, 4846, 260, 4884}

$$-\frac{\log\left(a^2x^2+1\right)}{2a^3c}-\frac{\tan^{-1}(ax)^2}{2a^3c}+\frac{x\tan^{-1}(ax)}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] (x*ArcTan[a*x])/(a^2*c) - ArcTan[a*x]^2/(2*a^3*c) - Log[1 + a^2*x^2]/(2*a^3
*c)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2\tan^{-1}(ax)}{c+a^2cx^2}\,dx &= -\frac{\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^2}+\frac{\int \tan^{-1}(ax)\,dx}{a^2c}\\
&= \frac{x\tan^{-1}(ax)}{a^2c}-\frac{\tan^{-1}(ax)^2}{2a^3c}-\frac{\int \frac{x}{1+a^2x^2}\,dx}{ac}\\
&= \frac{x\tan^{-1}(ax)}{a^2c}-\frac{\tan^{-1}(ax)^2}{2a^3c}-\frac{\log\left(1+a^2x^2\right)}{2a^3c}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 1.00

$$-\frac{\tan^{-1}(ax)^2}{2a^3c}+\frac{x\tan^{-1}(ax)}{a^2c}-\frac{\log\left(a^2x^2+1\right)}{2a^3c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] (x*ArcTan[a*x])/(a^2*c) - ArcTan[a*x]^2/(2*a^3*c) - Log[1 + a^2*x^2]/(2*a^3
*c)
```

fricas [A] time = 0.46, size = 37, normalized size = 0.76

$$\frac{2\,ax\arctan\left(ax\right)-\arctan\left(ax\right)^2-\log\left(a^2x^2+1\right)}{2\,a^3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/2*(2*a*x*arctan(a*x) - arctan(a*x)^2 - log(a^2*x^2 + 1))/(a^3*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 46, normalized size = 0.94

$$\frac{x\arctan\left(ax\right)}{a^2c}-\frac{\arctan\left(ax\right)^2}{2a^3c}-\frac{\ln\left(a^2x^2+1\right)}{2a^3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)/(a^2*c*x^2+c),x)
```

```
[Out] x*arctan(a*x)/a^2/c-1/2*arctan(a*x)^2/a^3/c-1/2*ln(a^2*x^2+1)/a^3/c
```

maxima [A] time = 0.42, size = 54, normalized size = 1.10

$$\left(\frac{x}{a^2c}-\frac{\arctan\left(ax\right)}{a^3c}\right)\arctan\left(ax\right)+\frac{\arctan\left(ax\right)^2-\log\left(a^2x^2+1\right)}{2\,a^3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] (x/(a^2*c) - arctan(a*x)/(a^3*c))*arctan(a*x) + 1/2*(arctan(a*x)^2 - log(a^
2*x^2 + 1))/(a^3*c)
```

mupad [B] time = 0.16, size = 33, normalized size = 0.67

$$-\frac{\mathrm{atan}\left(a\,x\right)^2-2\,a\,x\,\mathrm{atan}\left(a\,x\right)+\ln\left(a^2\,x^2+1\right)}{2\,a^3\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x))/(c + a^2*c*x^2),x)
```

```
[Out] -(log(a^2*x^2 + 1) + atan(a*x)^2 - 2*a*x*atan(a*x))/(2*a^3*c)
```

sympy [**A**] time = 1.05, size = 75, normalized size = 1.53

$$\begin{cases} \frac{x\operatorname{atan}(ax)}{a^2c} - \frac{\log\left(x^2+\frac{1}{a^2}\right)}{2a^3c} - \frac{\operatorname{atan}^2(ax)}{2a^3c} & \text{for } c \neq 0 \\ \tilde{\infty}\left(\frac{x^3\operatorname{atan}(ax)}{3} - \frac{x^2}{6a} + \frac{\log\left(a^2x^2+1\right)}{6a^3}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)/(a**2*c*x**2+c),x)
```

```
[Out] Piecewise((x*atan(a*x)/(a**2*c) - log(x**2 + a**(-2))/(2*a**3*c) - atan(a*x
)**2/(2*a**3*c), Ne(c, 0)), (zoo*(x**3*atan(a*x)/3 - x**2/(6*a) + log(a**2*
x**2 + 1)/(6*a**3)), True))
```

3.176 $\int \frac{x\tan^{-1}(ax)}{c+a^2cx^2}\,dx$

Optimal. Leaf size=72

$$-\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{2a^2c}-\frac{i\tan^{-1}(ax)^2}{2a^2c}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^2c}$$

```
[Out] -1/2*I*arctan(a*x)^2/a^2/c-arctan(a*x)*ln(2/(1+I*a*x))/a^2/c-1/2*I*polylog(
2,1-2/(1+I*a*x))/a^2/c
```

Rubi [A] time = 0.07, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4920, 4854, 2402, 2315}

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^2c}-\frac{i\tan^{-1}(ax)^2}{2a^2c}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] ((-I/2)*ArcTan[a*x]^2)/(a^2*c) - (ArcTan[a*x]*Log[2/(1 + I*a*x)])/(a^2*c) -
 ((I/2)*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^2*c)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)}{c+a^2cx^2}\,dx = -\frac{i\tan^{-1}(ax)^2}{2a^2c} - \frac{\int \frac{\tan^{-1}(ax)}{i-ax}\,dx}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^2}{2a^2c} - \frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^2c} + \frac{\int \frac{\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^2}{2a^2c} - \frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^2c} - \frac{i\,\text{Subst}\left(\int \frac{\log(2x)}{1-2x}\,dx, x, \frac{1}{1+iax}\right)}{a^2c}$$
$$= -\frac{i\tan^{-1}(ax)^2}{2a^2c} - \frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^2c} - \frac{i\text{Li}_2\left(1-\frac{2}{1+iax}\right)}{2a^2c}$$

Mathematica [A] time = 0.01, size = 77, normalized size = 1.07

$$-\frac{i\text{Li}_2\left(\frac{ax+i}{ax-i}\right)}{2a^2c} - \frac{i\tan^{-1}(ax)^2}{2a^2c} - \frac{\log\left(\frac{2i}{-ax+i}\right)\tan^{-1}(ax)}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x])/(c + a^2*c*x^2),x]
```

```
[Out] ((-1/2*I)*ArcTan[a*x]^2)/(a^2*c) - (ArcTan[a*x]*Log[(2*I)/(I - a*x)])/(a^2*
c) - ((I/2)*PolyLog[2, (I + a*x)/(-I + a*x)])/(a^2*c)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x\arctan(ax)}{a^2cx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x*arctan(a*x)/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.09, size = 202, normalized size = 2.81

$$\frac{\arctan(ax)\ln\left(a^2x^2+1\right)}{2a^2c} + \frac{i\ln(ax-i)\ln\left(a^2x^2+1\right)}{4a^2c} - \frac{i\ln(ax-i)^2}{8a^2c} - \frac{i\,\text{dilog}\left(-\frac{i(ax+i)}{2}\right)}{4a^2c} - \frac{i\ln(ax-i)\ln\left(-\frac{i(ax+i)}{2}\right)}{4a^2c} - \frac{i}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)/(a^2*c*x^2+c),x)
```

```
[Out] 1/2/a^2/c*arctan(a*x)*ln(a^2*x^2+1)+1/4*I/a^2/c*ln(a*x-I)*ln(a^2*x^2+1)-1/8
*I/a^2/c*ln(a*x-I)^2-1/4*I/a^2/c*dilog(-1/2*I*(I+a*x))-1/4*I/a^2/c*ln(a*x-I
)*ln(-1/2*I*(I+a*x))-1/4*I/a^2/c*ln(I+a*x)*ln(a^2*x^2+1)+1/8*I/a^2/c*ln(I+a
```

```
*x)^2+1/4*I/a^2/c*dilog(1/2*I*(a*x-I))+1/4*I/a^2/c*ln(I+a*x)*ln(1/2*I*(a*x-
I))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \arctan (ax)}{a^2 c x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x*arctan(a*x)/(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x \operatorname{atan}(a\, x)}{c\, a^2\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x))/(c + a^2*c*x^2),x)
```

```
[Out] int((x*atan(a*x))/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}(ax)}{a^2x^2+1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x*atan(a*x)/(a**2*x**2 + 1), x)/c
```

3.177 $\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx$

Optimal. Leaf size=16

$$\frac{\tan^{-1}(ax)^2}{2ac}$$

[Out] 1/2*arctan(a*x)^2/a/c

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.059, Rules used = {4884}

$$\frac{\tan^{-1}(ax)^2}{2ac}$$

Antiderivative was successfully verified.

[In] Int[ArcTan[a*x]/(c + a^2*c*x^2),x]

[Out] ArcTan[a*x]^2/(2*a*c)

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx = \frac{\tan^{-1}(ax)^2}{2ac}$$

Mathematica [A] time = 0.00, size = 16, normalized size = 1.00

$$\frac{\tan^{-1}(ax)^2}{2ac}$$

Antiderivative was successfully verified.

[In] Integrate[ArcTan[a*x]/(c + a^2*c*x^2),x]

[Out] ArcTan[a*x]^2/(2*a*c)

fricas [A] time = 0.47, size = 14, normalized size = 0.88

$$\frac{\arctan(ax)^2}{2\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)/(a^2*c*x^2+c),x, algorithm="fricas")

[Out] 1/2*arctan(a*x)^2/(a*c)

giac [B] time = 0.17, size = 35, normalized size = 2.19

$$-\frac{2\,\pi\arctan(ax)\left\lfloor\frac{\arctan(ax)}{\pi}+\frac{1}{2}\right\rfloor-\arctan(ax)^2}{2\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] -1/2*(2*pi*arctan(a*x)*floor(arctan(a*x)/pi + 1/2) - arctan(a*x)^2)/(a*c)
```

maple [A] time = 0.03, size = 15, normalized size = 0.94

$$\frac{\arctan(ax)^2}{2ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(a^2*c*x^2+c),x)
```

```
[Out] 1/2*arctan(a*x)^2/a/c
```

maxima [A] time = 0.42, size = 14, normalized size = 0.88

$$\frac{\arctan(ax)^2}{2\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] 1/2*arctan(a*x)^2/(a*c)
```

mupad [B] time = 0.38, size = 14, normalized size = 0.88

$$\frac{\mathrm{atan}(a\,x)^2}{2\,a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + a^2*c*x^2),x)
```

```
[Out] atan(a*x)^2/(2*a*c)
```

sympy [A] time = 2.37, size = 36, normalized size = 2.25

$$\begin{cases} 0 & \text{for}\ a = 0 \\ \tilde{\infty}\left(\begin{cases} 0 & \text{for}\ a = 0 \\ \frac{ax\,\mathrm{atan}(ax) - \frac{\log(a^2x^2+1)}{2}}{a} & \text{otherwise} \end{cases}\right) & \text{for}\ c = 0 \\ \frac{\mathrm{atan}^2(ax)}{2ac} & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(a**2*c*x**2+c),x)
```

```
[Out] Piecewise((0, Eq(a, 0)), (zoo*Piecewise((0, Eq(a, 0)), ((a*x*atan(a*x) - lo
g(a**2*x**2 + 1)/2)/a, True)), Eq(c, 0)), (atan(a*x)**2/(2*a*c), True))
```

3.178 $\int \frac{\tan^{-1}(ax)}{x(c+a^2cx^2)}\,dx$

Optimal. Leaf size=64

$$-\frac{i\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c}-\frac{i\tan^{-1}(ax)^2}{2c}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c}$$

```
[Out] -1/2*I*arctan(a*x)^2/c+arctan(a*x)*ln(2-2/(1-I*a*x))/c-1/2*I*polylog(2,-1+2
/(1-I*a*x))/c
```

Rubi [A] time = 0.10, antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4924, 4868, 2447}

$$-\frac{i\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c}-\frac{i\tan^{-1}(ax)^2}{2c}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x*(c + a^2*c*x^2)),x]
```

```
[Out] ((-I/2)*ArcTan[a*x]^2)/c + (ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/c - ((I/2)*
PolyLog[2, -1 + 2/(1 - I*a*x)])/c
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)}\,dx &= -\frac{i\tan^{-1}(ax)^2}{2c}+\frac{i\int \frac{\tan^{-1}(ax)}{x(i+ax)}\,dx}{c}\\ &= -\frac{i\tan^{-1}(ax)^2}{2c}+\frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{a\int \frac{\log\left(2-\frac{2}{1-iax}\right)}{1+a^2x^2}\,dx}{c}\\ &= -\frac{i\tan^{-1}(ax)^2}{2c}+\frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{i\text{Li}_2\left(-1+\frac{2}{1-iax}\right)}{2c}\end{aligned}$$

Mathematica [A] time = 0.03, size = 103, normalized size = 1.61

$$\frac{i\text{Li}_2(-iax)}{2c}-\frac{i\text{Li}_2(iax)}{2c}+\frac{i\text{Li}_2\left(-\frac{ax+i}{i-ax}\right)}{2c}+\frac{i\tan^{-1}(ax)^2}{2c}+\frac{\log\left(\frac{2i}{-ax+i}\right)\tan^{-1}(ax)}{c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x*(c + a^2*c*x^2)),x]
```

```
[Out] ((I/2)*ArcTan[a*x]^2)/c + (ArcTan[a*x]*Log[(2*I)/(I - a*x)])/c + ((I/2)*Pol
yLog[2, (-I)*a*x])/c - ((I/2)*PolyLog[2, I*a*x])/c + ((I/2)*PolyLog[2, -((I
 + a*x)/(I - a*x))])/c
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan\left(ax\right)}{a^2cx^3+cx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)/(a^2*c*x^3 + c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 251, normalized size = 3.92

$$\frac{\arctan\left(ax\right)\ln\left(ax\right)}{c}-\frac{\arctan\left(ax\right)\ln\left(a^2x^2+1\right)}{2c}+\frac{i\ln\left(ax\right)\ln\left(iax+1\right)}{2c}-\frac{i\ln\left(ax\right)\ln\left(-iax+1\right)}{2c}+\frac{i\,\text{dilog}\left(iax+1\right)}{2c}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x/(a^2*c*x^2+c),x)
```

```
[Out] 1/c*arctan(a*x)*ln(a*x)-1/2/c*arctan(a*x)*ln(a^2*x^2+1)+1/2*I/c*ln(a*x)*ln(
1+I*a*x)-1/2*I/c*ln(a*x)*ln(1-I*a*x)+1/2*I/c*dilog(1+I*a*x)-1/2*I/c*dilog(1
-I*a*x)-1/4*I/c*ln(a*x-I)*ln(a^2*x^2+1)+1/8*I/c*ln(a*x-I)^2+1/4*I/c*dilog(-
1/2*I*(I+a*x))+1/4*I/c*ln(a*x-I)*ln(-1/2*I*(I+a*x))+1/4*I/c*ln(I+a*x)*ln(a^
2*x^2+1)-1/8*I/c*ln(I+a*x)^2-1/4*I/c*dilog(1/2*I*(a*x-I))-1/4*I/c*ln(I+a*x)
*ln(1/2*I*(a*x-I))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan\left(ax\right)}{\left(a^2cx^2+c\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\operatorname{atan}(a\,x)}{x\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)/(x*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}(ax)}{a^2x^3+x}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)/(a**2*x**3 + x), x)/c
```

3.179 $\int \frac{\tan^{-1}(ax)}{x^2(c+a^2cx^2)} dx$

Optimal. Leaf size=52

$$-\frac{a\log\left(a^2x^2+1\right)}{2c}+\frac{a\log(x)}{c}-\frac{a\tan^{-1}(ax)^2}{2c}-\frac{\tan^{-1}(ax)}{cx}$$

```
[Out] -arctan(a*x)/c/x-1/2*a*arctan(a*x)^2/c+a*ln(x)/c-1/2*a*ln(a^2*x^2+1)/c
```

Rubi [A] time = 0.09, antiderivative size = 52, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4918, 4852, 266, 36, 29, 31, 4884}

$$-\frac{a\log\left(a^2x^2+1\right)}{2c}+\frac{a\log(x)}{c}-\frac{a\tan^{-1}(ax)^2}{2c}-\frac{\tan^{-1}(ax)}{cx}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] -(ArcTan[a*x]/(c*x)) - (a*ArcTan[a*x]^2)/(2*c) + (a*Log[x])/c - (a*Log[1 +
a^2*x^2])/(2*c)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x^2}\,dx}{c}$$
$$= -\frac{\tan^{-1}(ax)}{cx}-\frac{a\tan^{-1}(ax)^2}{2c}+\frac{a\int \frac{1}{x\left(1+a^2x^2\right)}\,dx}{c}$$
$$= -\frac{\tan^{-1}(ax)}{cx}-\frac{a\tan^{-1}(ax)^2}{2c}+\frac{a\,\text{Subst}\left(\int \frac{1}{x\left(1+a^2x\right)}\,dx,x,x^2\right)}{2c}$$
$$= -\frac{\tan^{-1}(ax)}{cx}-\frac{a\tan^{-1}(ax)^2}{2c}+\frac{a\,\text{Subst}\left(\int \frac{1}{x}\,dx,x,x^2\right)}{2c}-\frac{a^3\,\text{Subst}\left(\int \frac{1}{1+a^2x}\,dx,x,x^2\right)}{2c}$$
$$= -\frac{\tan^{-1}(ax)}{cx}-\frac{a\tan^{-1}(ax)^2}{2c}+\frac{a\log(x)}{c}-\frac{a\log\left(1+a^2x^2\right)}{2c}$$

Mathematica [A] time = 0.01, size = 52, normalized size = 1.00

$$-\frac{a\log\left(a^2x^2+1\right)}{2c}+\frac{a\log(x)}{c}-\frac{a\tan^{-1}(ax)^2}{2c}-\frac{\tan^{-1}(ax)}{cx}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] -(ArcTan[a*x]/(c*x)) - (a*ArcTan[a*x]^2)/(2*c) + (a*Log[x])/c - (a*Log[1 +
a^2*x^2])/(2*c)
```

fricas [A] time = 0.68, size = 43, normalized size = 0.83

$$-\frac{ax\arctan(ax)^2+ax\log\left(a^2x^2+1\right)-2\,ax\log(x)+2\,\arctan(ax)}{2\,cx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] -1/2*(a*x*arctan(a*x)^2 + a*x*log(a^2*x^2 + 1) - 2*a*x*log(x) + 2*arctan(a*
x))/(c*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 51, normalized size = 0.98

$$-\frac{\arctan(ax)}{cx}-\frac{a\arctan(ax)^2}{2c}+\frac{a\ln(ax)}{c}-\frac{a\ln\left(a^2x^2+1\right)}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^2/(a^2*c*x^2+c),x)
```

```
[Out] -arctan(a*x)/c/x-1/2*a*arctan(a*x)^2/c+a/c*ln(a*x)-1/2*a*ln(a^2*x^2+1)/c
```

maxima [A] time = 0.44, size = 53, normalized size = 1.02

$$-\left(\frac{a\arctan\left(ax\right)}{c}+\frac{1}{cx}\right)\arctan\left(ax\right)+\frac{\left(\arctan\left(ax\right)^2-\log\left(a^2x^2+1\right)+2\log(x)\right)a}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] -(a*arctan(a*x)/c + 1/(c*x))*arctan(a*x) + 1/2*(arctan(a*x)^2 - log(a^2*x^2
 + 1) + 2*log(x))*a/c
```

mupad [B] time = 0.45, size = 48, normalized size = 0.92

$$\frac{a\ \ln(x)}{c}-\frac{a\ \ln\left(a^2\,x^2+1\right)}{2\,c}-\frac{a\,\mathrm{atan}\left(a\,x\right)^2}{2\,c}-\frac{\mathrm{atan}\left(a\,x\right)}{c\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^2*(c + a^2*c*x^2)),x)
```

```
[Out] (a*log(x))/c - (a*log(a^2*x^2 + 1))/(2*c) - (a*atan(a*x)^2)/(2*c) - atan(a*
x)/(c*x)
```

sympy [A] time = 1.47, size = 68, normalized size = 1.31

$$\begin{cases} \frac{a\log\left(x\right)}{c}-\frac{a\log\left(x^2+\frac{1}{a^2}\right)}{2c}-\frac{a\,\mathrm{atan}^2\left(ax\right)}{2c}-\frac{\mathrm{atan}\left(ax\right)}{cx} & \text{for}\ c\neq 0\\ \tilde{\infty}\left(a\log\left(x\right)-\frac{a\log\left(a^2x^2+1\right)}{2}-\frac{\mathrm{atan}\left(ax\right)}{x}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**2/(a**2*c*x**2+c),x)
```

```
[Out] Piecewise((a*log(x)/c - a*log(x**2 + a**(-2))/(2*c) - a*atan(a*x)**2/(2*c)
- atan(a*x)/(c*x), Ne(c, 0)), (zoo*(a*log(x) - a*log(a**2*x**2 + 1)/2 - ata
n(a*x)/x), True))
```

3.180 $\int \frac{\tan^{-1}(ax)}{x^3(c+a^2cx^2)} dx$

Optimal. Leaf size=113

$$\frac{ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c}+\frac{ia^2\tan^{-1}(ax)^2}{2c}-\frac{a^2\tan^{-1}(ax)}{2c}-\frac{a^2\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c}-\frac{\tan^{-1}(ax)}{2cx^2}-\frac{a}{2cx}$$

```
[Out] -1/2*a/c/x-1/2*a^2*arctan(a*x)/c-1/2*arctan(a*x)/c/x^2+1/2*I*a^2*arctan(a*x
)^2/c-a^2*arctan(a*x)*ln(2-2/(1-I*a*x))/c+1/2*I*a^2*polylog(2,-1+2/(1-I*a*x
))/c
```

Rubi [A] time = 0.16, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4918, 4852, 325, 203, 4924, 4868, 2447}

$$\frac{ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c}+\frac{ia^2\tan^{-1}(ax)^2}{2c}-\frac{a^2\tan^{-1}(ax)}{2c}-\frac{a^2\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c}-\frac{\tan^{-1}(ax)}{2cx^2}-\frac{a}{2cx}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] -a/(2*c*x) - (a^2*ArcTan[a*x])/(2*c) - ArcTan[a*x]/(2*c*x^2) + ((I/2)*a^2*A
rcTan[a*x]^2)/c - (a^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/c + ((I/2)*a^2*P
olyLog[2, -1 + 2/(1 - I*a*x)])/c
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
```

```
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^3\left(c+a^2cx^2\right)}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x^3}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^2}{2c}+\frac{a\int \frac{1}{x^2\left(1+a^2x^2\right)}\,dx}{2c}-\frac{\left(ia^2\right)\int \frac{\tan^{-1}(ax)}{x(i+ax)}\,dx}{c}$$

$$= -\frac{a}{2cx}-\frac{\tan^{-1}(ax)}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^2}{2c}-\frac{a^2\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{a^3\int \frac{1}{1+a^2x^2}\,dx}{2c}+$$

$$= -\frac{a}{2cx}-\frac{a^2\tan^{-1}(ax)}{2c}-\frac{\tan^{-1}(ax)}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^2}{2c}-\frac{a^2\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{c}+$$

Mathematica [C] time = 0.06, size = 142, normalized size = 1.26

$$-\frac{a\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-a^2x^2\right)}{2cx}-\frac{a^2\left(\frac{1}{2}i\text{Li}_2(-iax)-\frac{1}{2}i\text{Li}_2(iax)+\frac{1}{2}\left(i\text{Li}_2\left(-\frac{ax+i}{i-ax}\right)+2\log\left(\frac{2i}{-ax+i}\right)\tan^{-1}(ax)\right)+\frac{1}{2}i\tan^{-1}(\right.}{c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] -1/2*ArcTan[a*x]/(c*x^2) - (a*Hypergeometric2F1[-1/2, 1, 1/2, -(a^2*x^2)])/
(2*c*x) - (a^2*((I/2)*ArcTan[a*x]^2 + (I/2)*PolyLog[2, (-I)*a*x] - (I/2)*Po
lyLog[2, I*a*x] + (2*ArcTan[a*x]*Log[(2*I)/(I - a*x)] + I*PolyLog[2, -((I +
 a*x)/(I - a*x))])/2))/c
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)}{a^2cx^5+cx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)/(a^2*c*x^5 + c*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.10, size = 327, normalized size = 2.89

$$-\frac{\arctan(ax)}{2c\,x^2}-\frac{a^2\arctan(ax)\ln(ax)}{c}+\frac{a^2\arctan(ax)\ln\left(a^2x^2+1\right)}{2c}-\frac{ia^2\ln(ax)\ln(iax+1)}{2c}+\frac{ia^2\operatorname{dilog}(-iax+1)}{2c}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^3/(a^2*c*x^2+c),x)
```

```
[Out] -1/2*arctan(a*x)/c/x^2-a^2/c*arctan(a*x)*ln(a*x)+1/2*a^2/c*arctan(a*x)*ln(a
^2*x^2+1)-1/2*I*a^2/c*ln(a*x)*ln(1+I*a*x)-1/2*I*a^2/c*dilog(1+I*a*x)+1/2*I*
a^2/c*dilog(1-I*a*x)+1/4*I*a^2/c*ln(a*x-I)*ln(a^2*x^2+1)-1/4*I*a^2/c*dilog(
-1/2*I*(I+a*x))+1/4*I*a^2/c*ln(I+a*x)*ln(1/2*I*(a*x-I))-1/4*I*a^2/c*ln(I+a*
x)*ln(a^2*x^2+1)+1/4*I*a^2/c*dilog(1/2*I*(a*x-I))-1/2*a/c/x-1/2*a^2*arctan(
a*x)/c-1/8*I*a^2/c*ln(a*x-I)^2+1/2*I*a^2/c*ln(a*x)*ln(1-I*a*x)-1/4*I*a^2/c*
ln(a*x-I)*ln(-1/2*I*(I+a*x))+1/8*I*a^2/c*ln(I+a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}(a\,x)}{x^3\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)/(x^3*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}(ax)}{a^2x^5+x^3}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**3/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)/(a**2*x**5 + x**3), x)/c
```

3.181 $\int \frac{\tan^{-1}(ax)}{x^4(c+a^2cx^2)}\,dx$

Optimal. Leaf size=88

$$-\frac{4a^3\log(x)}{3c}+\frac{a^3\tan^{-1}(ax)^2}{2c}+\frac{a^2\tan^{-1}(ax)}{cx}+\frac{2a^3\log\left(a^2x^2+1\right)}{3c}-\frac{\tan^{-1}(ax)}{3cx^3}-\frac{a}{6cx^2}$$

```
[Out] -1/6*a/c/x^2-1/3*arctan(a*x)/c/x^3+a^2*arctan(a*x)/c/x+1/2*a^3*arctan(a*x)^
2/c-4/3*a^3*ln(x)/c+2/3*a^3*ln(a^2*x^2+1)/c
```

Rubi [A] time = 0.16, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4918, 4852, 266, 44, 36, 29, 31, 4884}

$$\frac{2a^3\log\left(a^2x^2+1\right)}{3c}-\frac{4a^3\log(x)}{3c}+\frac{a^3\tan^{-1}(ax)^2}{2c}+\frac{a^2\tan^{-1}(ax)}{cx}-\frac{a}{6cx^2}-\frac{\tan^{-1}(ax)}{3cx^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] -a/(6*c*x^2) - ArcTan[a*x]/(3*c*x^3) + (a^2*ArcTan[a*x])/(c*x) + (a^3*ArcTa
n[a*x]^2)/(2*c) - (4*a^3*Log[x])/(3*c) + (2*a^3*Log[1 + a^2*x^2])/(3*c)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^4\left(c+a^2cx^2\right)}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x^4}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)}{3cx^3}+a^4\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx+\frac{a\int \frac{1}{x^3(1+a^2x^2)}\,dx}{3c}-\frac{a^2\int \frac{\tan^{-1}(ax)}{x^2}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)}{3cx^3}+\frac{a^2\tan^{-1}(ax)}{cx}+\frac{a^3\tan^{-1}(ax)^2}{2c}+\frac{a\,\mathrm{Subst}\left(\int \frac{1}{x^2(1+a^2x)}\,dx,x,x^2\right)}{6c}-\frac{a^3\int \frac{1}{x(1+a^2}}{c}$$

$$= -\frac{\tan^{-1}(ax)}{3cx^3}+\frac{a^2\tan^{-1}(ax)}{cx}+\frac{a^3\tan^{-1}(ax)^2}{2c}+\frac{a\,\mathrm{Subst}\left(\int \left(\frac{1}{x^2}-\frac{a^2}{x}+\frac{a^4}{1+a^2x}\right)dx,x,x^2\right)}{6c}-\frac{a}{}$$

$$= -\frac{a}{6cx^2}-\frac{\tan^{-1}(ax)}{3cx^3}+\frac{a^2\tan^{-1}(ax)}{cx}+\frac{a^3\tan^{-1}(ax)^2}{2c}-\frac{a^3\log(x)}{3c}+\frac{a^3\log\left(1+a^2x^2\right)}{6c}-\frac{a^3}{}$$

$$= -\frac{a}{6cx^2}-\frac{\tan^{-1}(ax)}{3cx^3}+\frac{a^2\tan^{-1}(ax)}{cx}+\frac{a^3\tan^{-1}(ax)^2}{2c}-\frac{4a^3\log(x)}{3c}+\frac{2a^3\log\left(1+a^2x^2\right)}{3c}$$

Mathematica [A] time = 0.02, size = 88, normalized size = 1.00

$$-\frac{4a^3\log(x)}{3c}+\frac{a^3\tan^{-1}(ax)^2}{2c}+\frac{a^2\tan^{-1}(ax)}{cx}+\frac{2a^3\log\left(a^2x^2+1\right)}{3c}-\frac{\tan^{-1}(ax)}{3cx^3}-\frac{a}{6cx^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] -1/6*a/(c*x^2) - ArcTan[a*x]/(3*c*x^3) + (a^2*ArcTan[a*x])/(c*x) + (a^3*Arc
Tan[a*x]^2)/(2*c) - (4*a^3*Log[x])/(3*c) + (2*a^3*Log[1 + a^2*x^2])/(3*c)
```

fricas [A] time = 0.46, size = 71, normalized size = 0.81

$$\frac{3\,a^3x^3\arctan(ax)^2+4\,a^3x^3\log\left(a^2x^2+1\right)-8\,a^3x^3\log(x)-ax+2\left(3\,a^2x^2-1\right)\arctan(ax)}{6\,cx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/6*(3*a^3*x^3*arctan(a*x)^2 + 4*a^3*x^3*log(a^2*x^2 + 1) - 8*a^3*x^3*log(x
) - a*x + 2*(3*a^2*x^2 - 1)*arctan(a*x))/(c*x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 81, normalized size = 0.92

$$-\frac{\arctan(ax)}{3c\,x^3}+\frac{a^2\arctan(ax)}{cx}+\frac{a^3\arctan(ax)^2}{2c}-\frac{a}{6c\,x^2}-\frac{4a^3\ln(ax)}{3c}+\frac{2a^3\ln\left(a^2x^2+1\right)}{3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^4/(a^2*c*x^2+c),x)
```

```
[Out] -1/3*arctan(a*x)/c/x^3+a^2*arctan(a*x)/c/x+1/2*a^3*arctan(a*x)^2/c-1/6*a/c/
x^2-4/3*a^3/c*ln(a*x)+2/3*a^3*ln(a^2*x^2+1)/c
```

maxima [A] time = 0.43, size = 90, normalized size = 1.02

$$\frac{1}{3}\left(\frac{3\,a^3\arctan(ax)}{c}+\frac{3\,a^2x^2-1}{cx^3}\right)\arctan(ax)-\frac{\left(3\,a^2x^2\arctan(ax)^2-4\,a^2x^2\log\left(a^2x^2+1\right)+8\,a^2x^2\log(x)+1\right.}{6\,cx^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] 1/3*(3*a^3*arctan(a*x)/c + (3*a^2*x^2 - 1)/(c*x^3))*arctan(a*x) - 1/6*(3*a^
2*x^2*arctan(a*x)^2 - 4*a^2*x^2*log(a^2*x^2 + 1) + 8*a^2*x^2*log(x) + 1)*a/
(c*x^2)
```

mupad [B] time = 0.47, size = 78, normalized size = 0.89

$$\frac{2\,a^3\,\ln\left(a^2\,x^2+1\right)}{3\,c}-\frac{\mathrm{atan}\left(a\,x\right)}{3\,c\,x^3}-\frac{a}{6\,c\,x^2}-\frac{4\,a^3\,\ln(x)}{3\,c}+\frac{a^3\,\mathrm{atan}\left(a\,x\right)^2}{2\,c}+\frac{a^2\,\mathrm{atan}\left(a\,x\right)}{c\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^4*(c + a^2*c*x^2)),x)
```

```
[Out] (2*a^3*log(a^2*x^2 + 1))/(3*c) - atan(a*x)/(3*c*x^3) - a/(6*c*x^2) - (4*a^3
*log(x))/(3*c) + (a^3*atan(a*x)^2)/(2*c) + (a^2*atan(a*x))/(c*x)
```

sympy [A] time = 2.53, size = 117, normalized size = 1.33

$$\begin{cases} -\frac{4a^3\log(x)}{3c}+\frac{2a^3\log\left(x^2+\frac{1}{a^2}\right)}{3c}+\frac{a^3\,\mathrm{atan}^2(ax)}{2c}+\frac{a^2\,\mathrm{atan}(ax)}{cx}-\frac{a}{6cx^2}-\frac{\mathrm{atan}(ax)}{3cx^3} & \text{for } c\neq 0 \\ \tilde{\infty}\left(-\frac{a^3\log(x)}{3}+\frac{a^3\log\left(a^2x^2+1\right)}{6}-\frac{a}{6x^2}-\frac{\mathrm{atan}(ax)}{3x^3}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**4/(a**2*c*x**2+c),x)
```

```
[Out] Piecewise((-4*a**3*log(x)/(3*c) + 2*a**3*log(x**2 + a**(-2))/(3*c) + a**3*a
tan(a*x)**2/(2*c) + a**2*atan(a*x)/(c*x) - a/(6*c*x**2) - atan(a*x)/(3*c*x*
*3), Ne(c, 0)), (zoo*(-a**3*log(x)/3 + a**3*log(a**2*x**2 + 1)/6 - a/(6*x**
2) - atan(a*x)/(3*x**3)), True))
```

3.182 $\int \frac{x^5 \tan^{-1}(ax)}{(c+a^2cx^2)^2} dx$

Optimal. Leaf size=157

$$\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{a^6c^2}+\frac{i\tan^{-1}(ax)^2}{a^6c^2}+\frac{3\tan^{-1}(ax)}{4a^6c^2}+\frac{2\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^6c^2}-\frac{x}{2a^5c^2}+\frac{x^2\tan^{-1}(ax)}{2a^4c^2}-\frac{\tan^{-1}(ax)}{2a^6c^2\left(a^2x^2+1\right)}+\frac{}{4a}$$

```
[Out] -1/2*x/a^5/c^2+1/4*x/a^5/c^2/(a^2*x^2+1)+3/4*arctan(a*x)/a^6/c^2+1/2*x^2*ar
ctan(a*x)/a^4/c^2-1/2*arctan(a*x)/a^6/c^2/(a^2*x^2+1)+I*arctan(a*x)^2/a^6/c
^2+2*arctan(a*x)*ln(2/(1+I*a*x))/a^6/c^2+I*polylog(2,1-2/(1+I*a*x))/a^6/c^2
```

Rubi [A] time = 0.36, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4964, 4916, 4852, 321, 203, 4920, 4854, 2402, 2315, 4930, 199, 205}

$$\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^6c^2}+\frac{x}{4a^5c^2\left(a^2x^2+1\right)}+\frac{x^2\tan^{-1}(ax)}{2a^4c^2}-\frac{\tan^{-1}(ax)}{2a^6c^2\left(a^2x^2+1\right)}-\frac{x}{2a^5c^2}+\frac{i\tan^{-1}(ax)^2}{a^6c^2}+\frac{3\tan^{-1}(ax)}{4a^6c^2}+\frac{2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] -x/(2*a^5*c^2) + x/(4*a^5*c^2*(1 + a^2*x^2)) + (3*ArcTan[a*x])/(4*a^6*c^2)
+ (x^2*ArcTan[a*x])/(2*a^4*c^2) - ArcTan[a*x]/(2*a^6*c^2*(1 + a^2*x^2)) + (
I*ArcTan[a*x]^2)/(a^6*c^2) + (2*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(a^6*c^2) +
 (I*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^6*c^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^5 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{\int \frac{x^3 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{a^2} + \frac{\int \frac{x^3 \tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^2c}$$

$$= \frac{\int \frac{x \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{a^4} + \frac{\int x \tan^{-1}(ax)\,dx}{a^4c^2} - 2\frac{\int \frac{x \tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^4c}$$

$$= \frac{x^2 \tan^{-1}(ax)}{2a^4c^2} - \frac{\tan^{-1}(ax)}{2a^6c^2\left(1+a^2x^2\right)} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx}{2a^5} - 2\left(-\frac{i\tan^{-1}(ax)^2}{2a^6c^2} - \frac{\int \frac{\tan^{-1}(ax)}{i-ax}\,dx}{a^5c^2}\right) - \frac{\int$$

$$= -\frac{x}{2a^5c^2} + \frac{x}{4a^5c^2\left(1+a^2x^2\right)} + \frac{x^2 \tan^{-1}(ax)}{2a^4c^2} - \frac{\tan^{-1}(ax)}{2a^6c^2\left(1+a^2x^2\right)} + \frac{\int \frac{1}{1+a^2x^2}\,dx}{2a^5c^2} - 2\left(-\frac{i\tan^{-1}(}{2a^6c}\right.$$

$$= -\frac{x}{2a^5c^2} + \frac{x}{4a^5c^2\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)}{4a^6c^2} + \frac{x^2 \tan^{-1}(ax)}{2a^4c^2} - \frac{\tan^{-1}(ax)}{2a^6c^2\left(1+a^2x^2\right)} - 2\left(-\frac{i\tan^{-1}(}{2a^6c}\right.$$

$$= -\frac{x}{2a^5c^2} + \frac{x}{4a^5c^2\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)}{4a^6c^2} + \frac{x^2 \tan^{-1}(ax)}{2a^4c^2} - \frac{\tan^{-1}(ax)}{2a^6c^2\left(1+a^2x^2\right)} - 2\left(-\frac{i\tan^{-1}(}{2a^6c}\right.$$

Mathematica [A] time = 0.24, size = 90, normalized size = 0.57

$$\frac{2\tan^{-1}(ax)\left(2a^2x^2 + 8\log\left(1+e^{2i\tan^{-1}(ax)}\right) - \cos\left(2\tan^{-1}(ax)\right) + 2\right) - 8i\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) - 4ax - 8i\tan^{-1}(ax)^2}{8a^6c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^5*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-4*a*x - (8*I)*ArcTan[a*x]^2 + 2*ArcTan[a*x]*(2 + 2*a^2*x^2 - Cos[2*ArcTan
[a*x]] + 8*Log[1 + E^((2*I)*ArcTan[a*x])]) - (8*I)*PolyLog[2, -E^((2*I)*Arc
Tan[a*x])] + Sin[2*ArcTan[a*x]])/(8*a^6*c^2)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^5 \arctan(ax)}{a^4c^2x^4 + 2\,a^2c^2x^2 + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(x^5*arctan(a*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.12, size = 281, normalized size = 1.79

$$\frac{x^2 \arctan(ax)}{2a^4c^2} - \frac{\arctan(ax)\ln(a^2x^2+1)}{a^6c^2} - \frac{\arctan(ax)}{2a^6c^2(a^2x^2+1)} - \frac{x}{2a^5c^2} + \frac{x}{4a^5c^2(a^2x^2+1)} + \frac{3\arctan(ax)}{4a^6c^2} - \frac{i\ln(ax}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arctan(a*x)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/2*x^2*arctan(a*x)/a^4/c^2-1/a^6/c^2*arctan(a*x)*ln(a^2*x^2+1)-1/2*arctan(
a*x)/a^6/c^2/(a^2*x^2+1)-1/2*x/a^5/c^2+1/4*x/a^5/c^2/(a^2*x^2+1)+3/4*arctan
(a*x)/a^6/c^2-1/2*I/a^6/c^2*ln(a*x-I)*ln(a^2*x^2+1)+1/4*I/a^6/c^2*ln(a*x-I)
^2+1/2*I/a^6/c^2*dilog(-1/2*I*(I+a*x))+1/2*I/a^6/c^2*ln(a*x-I)*ln(-1/2*I*(I
+a*x))+1/2*I/a^6/c^2*ln(I+a*x)*ln(a^2*x^2+1)-1/4*I/a^6/c^2*ln(I+a*x)^2-1/2*
I/a^6/c^2*dilog(1/2*I*(a*x-I))-1/2*I/a^6/c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5 \arctan(ax)}{(a^2cx^2+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^5*arctan(a*x)/(a^2*c*x^2 + c)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5 \operatorname{atan}(a\,x)}{(c\,a^2\,x^2+c)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*atan(a*x))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^5*atan(a*x))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^5 \operatorname{atan}(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*atan(a*x)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**5*atan(a*x)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.183 $\int \frac{x^4 \tan^{-1}(ax)}{(c+a^2cx^2)^2} dx$

Optimal. Leaf size=96

$$-\frac{3\tan^{-1}(ax)^2}{4a^5c^2}+\frac{x\tan^{-1}(ax)}{a^4c^2}+\frac{1}{4a^5c^2\left(a^2x^2+1\right)}-\frac{\log\left(a^2x^2+1\right)}{2a^5c^2}+\frac{x\tan^{-1}(ax)}{2a^4c^2\left(a^2x^2+1\right)}$$

```
[Out] 1/4/a^5/c^2/(a^2*x^2+1)+x*arctan(a*x)/a^4/c^2+1/2*x*arctan(a*x)/a^4/c^2/(a^
2*x^2+1)-3/4*arctan(a*x)^2/a^5/c^2-1/2*ln(a^2*x^2+1)/a^5/c^2
```

Rubi [A] time = 0.18, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4964, 4916, 4846, 260, 4884, 4934}

$$\frac{1}{4a^5c^2\left(a^2x^2+1\right)}-\frac{\log\left(a^2x^2+1\right)}{2a^5c^2}+\frac{x\tan^{-1}(ax)}{2a^4c^2\left(a^2x^2+1\right)}-\frac{3\tan^{-1}(ax)^2}{4a^5c^2}+\frac{x\tan^{-1}(ax)}{a^4c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] 1/(4*a^5*c^2*(1 + a^2*x^2)) + (x*ArcTan[a*x])/(a^4*c^2) + (x*ArcTan[a*x])/(
2*a^4*c^2*(1 + a^2*x^2)) - (3*ArcTan[a*x]^2)/(4*a^5*c^2) - Log[1 + a^2*x^2]
/(2*a^5*c^2)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4934

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^2*((d_) + (e_.)*(x_)^2)^(q_), x
_Symbol] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c^3*d*(q + 1)^2), x] + (-Dist[
1/(2*c^2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] +
Simp[(x*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*c^2*d*(q + 1)), x]) /;
FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -5/2]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x^4\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx &= -\frac{\int \frac{x^2\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{a^2}+\frac{\int \frac{x^2\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^2c}\\
&= \frac{1}{4a^5c^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)}{2a^4c^2\left(1+a^2x^2\right)}+\frac{\int \tan^{-1}(ax)\,dx}{a^4c^2}-\frac{\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{2a^4c}-\frac{\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^4c}\\
&= \frac{1}{4a^5c^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)}{a^4c^2}+\frac{x\tan^{-1}(ax)}{2a^4c^2\left(1+a^2x^2\right)}-\frac{3\tan^{-1}(ax)^2}{4a^5c^2}-\frac{\int \frac{x}{1+a^2x^2}\,dx}{a^3c^2}\\
&= \frac{1}{4a^5c^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)}{a^4c^2}+\frac{x\tan^{-1}(ax)}{2a^4c^2\left(1+a^2x^2\right)}-\frac{3\tan^{-1}(ax)^2}{4a^5c^2}-\frac{\log\left(1+a^2x^2\right)}{2a^5c^2}\end{aligned}$$

Mathematica [A] time = 0.07, size = 79, normalized size = 0.82

$$\frac{\left(4a^3x^3+6ax\right)\tan^{-1}(ax)-2\left(a^2x^2+1\right)\log\left(a^2x^2+1\right)-3\left(a^2x^2+1\right)\tan^{-1}(ax)^2+1}{4a^5c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^4*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] (1 + (6*a*x + 4*a^3*x^3)*ArcTan[a*x] - 3*(1 + a^2*x^2)*ArcTan[a*x]^2 - 2*(1
 + a^2*x^2)*Log[1 + a^2*x^2])/(4*a^5*c^2*(1 + a^2*x^2))
```

fricas [A] time = 0.53, size = 81, normalized size = 0.84

$$-\frac{3\left(a^2x^2+1\right)\arctan(ax)^2-2\left(2a^3x^3+3ax\right)\arctan(ax)+2\left(a^2x^2+1\right)\log\left(a^2x^2+1\right)-1}{4\left(a^7c^2x^2+a^5c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(3*(a^2*x^2 + 1)*arctan(a*x)^2 - 2*(2*a^3*x^3 + 3*a*x)*arctan(a*x) + 2
*(a^2*x^2 + 1)*log(a^2*x^2 + 1) - 1)/(a^7*c^2*x^2 + a^5*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 89, normalized size = 0.93

$$\frac{1}{4a^5c^2\left(a^2x^2+1\right)}+\frac{x\arctan(ax)}{a^4c^2}+\frac{x\arctan(ax)}{2a^4c^2\left(a^2x^2+1\right)}-\frac{3\arctan(ax)^2}{4a^5c^2}-\frac{\ln\left(a^2x^2+1\right)}{2a^5c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/4/a^5/c^2/(a^2*x^2+1)+x*arctan(a*x)/a^4/c^2+1/2*x*arctan(a*x)/a^4/c^2/(a^
2*x^2+1)-3/4*arctan(a*x)^2/a^5/c^2-1/2*ln(a^2*x^2+1)/a^5/c^2
```

maxima [A] time = 0.43, size = 114, normalized size = 1.19

$$\frac{1}{2}\left(\frac{x}{a^6c^2x^2+a^4c^2}+\frac{2x}{a^4c^2}-\frac{3\arctan(ax)}{a^5c^2}\right)\arctan(ax)+\frac{\left(3\left(a^2x^2+1\right)\arctan(ax)^2-2\left(a^2x^2+1\right)\log\left(a^2x^2+1\right)+\right.}{4\left(a^8c^2x^2+a^6c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(x/(a^6*c^2*x^2 + a^4*c^2) + 2*x/(a^4*c^2) - 3*arctan(a*x)/(a^5*c^2))*a
rctan(a*x) + 1/4*(3*(a^2*x^2 + 1)*arctan(a*x)^2 - 2*(a^2*x^2 + 1)*log(a^2*x
^2 + 1) + 1)*a/(a^8*c^2*x^2 + a^6*c^2)
```

mupad [B] time = 0.46, size = 94, normalized size = 0.98

$$\frac{1}{2\,a^2\,\left(2\,a^5\,c^2\,x^2+2\,a^3\,c^2\right)}-\frac{\ln\left(a^2\,x^2+1\right)}{2\,a^5\,c^2}+\frac{\mathrm{atan}\left(a\,x\right)\,\left(\frac{3\,x}{2\,a^6\,c^2}+\frac{x^3}{a^4\,c^2}\right)}{\frac{1}{a^2}+x^2}-\frac{3\,{\mathrm{atan}\left(a\,x\right)}^2}{4\,a^5\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x))/(c + a^2*c*x^2)^2,x)
```

```
[Out] 1/(2*a^2*(2*a^3*c^2 + 2*a^5*c^2*x^2)) - log(a^2*x^2 + 1)/(2*a^5*c^2) + (ata
n(a*x)*((3*x)/(2*a^6*c^2) + x^3/(a^4*c^2)))/(1/a^2 + x^2) - (3*atan(a*x)^2)
/(4*a^5*c^2)
```

sympy [A] time = 2.09, size = 264, normalized size = 2.75

$$\begin{cases} \frac{4a^3x^3\operatorname{atan}(ax)}{4a^7c^2x^2+4a^5c^2}-\frac{2a^2x^2\log\left(x^2+\frac{1}{a^2}\right)}{4a^7c^2x^2+4a^5c^2}-\frac{3a^2x^2\operatorname{atan}^2(ax)}{4a^7c^2x^2+4a^5c^2}+\frac{6ax\operatorname{atan}(ax)}{4a^7c^2x^2+4a^5c^2}-\frac{2\log\left(x^2+\frac{1}{a^2}\right)}{4a^7c^2x^2+4a^5c^2}-\frac{3\operatorname{atan}^2(ax)}{4a^7c^2x^2+4a^5c^2}+\frac{1}{4a^7c^2x^2+4a^5c^2} & \text{for } c \neq \\ \tilde{\infty}\left(\frac{x^5\operatorname{atan}(ax)}{5}-\frac{x^4}{20a}+\frac{x^2}{10a^3}-\frac{\log\left(a^2x^2+1\right)}{10a^5}\right) & \text{otherw} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Piecewise((4*a**3*x**3*atan(a*x)/(4*a**7*c**2*x**2 + 4*a**5*c**2) - 2*a**2*
x**2*log(x**2 + a**(-2))/(4*a**7*c**2*x**2 + 4*a**5*c**2) - 3*a**2*x**2*ata
n(a*x)**2/(4*a**7*c**2*x**2 + 4*a**5*c**2) + 6*a*x*atan(a*x)/(4*a**7*c**2*x
**2 + 4*a**5*c**2) - 2*log(x**2 + a**(-2))/(4*a**7*c**2*x**2 + 4*a**5*c**2)
 - 3*atan(a*x)**2/(4*a**7*c**2*x**2 + 4*a**5*c**2) + 1/(4*a**7*c**2*x**2 +
4*a**5*c**2), Ne(c, 0)), (zoo*(x**5*atan(a*x)/5 - x**4/(20*a) + x**2/(10*a*
*3) - log(a**2*x**2 + 1)/(10*a**5)), True))
```

3.184 $\int \frac{x^3 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2} \, dx$

Optimal. Leaf size=133

$$-\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{2a^4c^2}-\frac{i\tan^{-1}(ax)^2}{2a^4c^2}-\frac{\tan^{-1}(ax)}{4a^4c^2}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^4c^2}+\frac{\tan^{-1}(ax)}{2a^4c^2\left(a^2x^2+1\right)}-\frac{x}{4a^3c^2\left(a^2x^2+1\right)}$$

```
[Out] -1/4*x/a^3/c^2/(a^2*x^2+1)-1/4*arctan(a*x)/a^4/c^2+1/2*arctan(a*x)/a^4/c^2/
(a^2*x^2+1)-1/2*I*arctan(a*x)^2/a^4/c^2-arctan(a*x)*ln(2/(1+I*a*x))/a^4/c^2
-1/2*I*polylog(2,1-2/(1+I*a*x))/a^4/c^2
```

Rubi [A] time = 0.16, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4964, 4920, 4854, 2402, 2315, 4930, 199, 205}

$$-\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^4c^2}-\frac{x}{4a^3c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{2a^4c^2\left(a^2x^2+1\right)}-\frac{i\tan^{-1}(ax)^2}{2a^4c^2}-\frac{\tan^{-1}(ax)}{4a^4c^2}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^4c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] -x/(4*a^3*c^2*(1 + a^2*x^2)) - ArcTan[a*x]/(4*a^4*c^2) + ArcTan[a*x]/(2*a^4
*c^2*(1 + a^2*x^2)) - ((I/2)*ArcTan[a*x]^2)/(a^4*c^2) - (ArcTan[a*x]*Log[2/
(1 + I*a*x)])/(a^4*c^2) - ((I/2)*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^4*c^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{a^2}+\frac{\int \frac{x\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{a^2c}$$

$$= \frac{\tan^{-1}(ax)}{2a^4c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2a^4c^2}-\frac{\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx}{2a^3}-\frac{\int \frac{\tan^{-1}(ax)}{i-ax}\,dx}{a^3c^2}$$

$$= -\frac{x}{4a^3c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)}{2a^4c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2a^4c^2}-\frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^4c^2}+\frac{\int \frac{\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}}{a^3c^2}$$

$$= -\frac{x}{4a^3c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)}{4a^4c^2}+\frac{\tan^{-1}(ax)}{2a^4c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2a^4c^2}-\frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^4c^2}-$$

$$= -\frac{x}{4a^3c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)}{4a^4c^2}+\frac{\tan^{-1}(ax)}{2a^4c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2a^4c^2}-\frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^4c^2}-$$

Mathematica [A] time = 0.12, size = 77, normalized size = 0.58

$$\frac{4i\mathrm{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)+4i\tan^{-1}(ax)^2-\sin\left(2\tan^{-1}(ax)\right)+2\tan^{-1}(ax)\left(\cos\left(2\tan^{-1}(ax)\right)-4\log\left(1+e^{2i\tan^{-1}(ax)}\right)\right)}{8a^4c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] ((4*I)*ArcTan[a*x]^2 + 2*ArcTan[a*x]*(Cos[2*ArcTan[a*x]] - 4*Log[1 + E^((2*
I)*ArcTan[a*x])]) + (4*I)*PolyLog[2, -E^((2*I)*ArcTan[a*x])] - Sin[2*ArcTan
[a*x]])/(8*a^4*c^2)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^3 \arctan(ax)}{a^4c^2x^4 + 2\,a^2c^2x^2 + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(x^3*arctan(a*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.10, size = 257, normalized size = 1.93

$$\frac{\arctan(ax)\ln\left(a^2x^2+1\right)}{2a^4c^2}+\frac{\arctan(ax)}{2a^4c^2\left(a^2x^2+1\right)}-\frac{x}{4a^3c^2\left(a^2x^2+1\right)}-\frac{\arctan(ax)}{4a^4c^2}+\frac{i\ln(ax-i)\ln\left(a^2x^2+1\right)}{4a^4c^2}-\frac{i\ln(a}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/2/a^4/c^2*arctan(a*x)*ln(a^2*x^2+1)+1/2*arctan(a*x)/a^4/c^2/(a^2*x^2+1)-1
/4*x/a^3/c^2/(a^2*x^2+1)-1/4*arctan(a*x)/a^4/c^2+1/4*I/a^4/c^2*ln(a*x-I)*ln
(a^2*x^2+1)-1/8*I/a^4/c^2*ln(a*x-I)^2-1/4*I/a^4/c^2*dilog(-1/2*I*(I+a*x))-1
/4*I/a^4/c^2*ln(a*x-I)*ln(-1/2*I*(I+a*x))-1/4*I/a^4/c^2*ln(I+a*x)*ln(a^2*x^
2+1)+1/8*I/a^4/c^2*ln(I+a*x)^2+1/4*I/a^4/c^2*dilog(1/2*I*(a*x-I))+1/4*I/a^4
/c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan(ax)}{\left(a^2cx^2 + c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)/(a^2*c*x^2 + c)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3 \operatorname{atan}(a\,x)}{\left(c\,a^2\,x^2 + c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^3*atan(a*x))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \operatorname{atan}(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**3*atan(a*x)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.185 $\int \frac{x^2\tan^{-1}(ax)}{(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=64

$$\frac{\tan^{-1}(ax)^2}{4a^3c^2}-\frac{x\tan^{-1}(ax)}{2a^2c^2\left(a^2x^2+1\right)}-\frac{1}{4a^3c^2\left(a^2x^2+1\right)}$$

```
[Out] -1/4/a^3/c^2/(a^2*x^2+1)-1/2*x*arctan(a*x)/a^2/c^2/(a^2*x^2+1)+1/4*arctan(a
*x)^2/a^3/c^2
```

Rubi [A] time = 0.06, antiderivative size = 64, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4934, 4884}

$$-\frac{1}{4a^3c^2\left(a^2x^2+1\right)}-\frac{x\tan^{-1}(ax)}{2a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^2}{4a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] -1/(4*a^3*c^2*(1 + a^2*x^2)) - (x*ArcTan[a*x])/(2*a^2*c^2*(1 + a^2*x^2)) +
ArcTan[a*x]^2/(4*a^3*c^2)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4934

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^2*((d_) + (e_.)*(x_)^2)^(q_), x
_Symbol] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c^3*d*(q + 1)^2), x] + (-Dist[
1/(2*c^2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] +
Simp[(x*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*c^2*d*(q + 1)), x]) /;
FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -5/2]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx &= -\frac{1}{4a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}\,dx}{2a^2c}\\ &= -\frac{1}{4a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^2}{4a^3c^2}\end{aligned}$$

Mathematica [A] time = 0.04, size = 47, normalized size = 0.73

$$\frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^2-2ax\tan^{-1}(ax)-1}{4a^3c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-1 - 2*a*x*ArcTan[a*x] + (1 + a^2*x^2)*ArcTan[a*x]^2)/(4*a^3*c^2*(1 + a^2*
x^2))
```

fricas [A] time = 0.52, size = 49, normalized size = 0.77

$$-\frac{2\,ax\arctan\left(ax\right)-\left(a^2x^2+1\right)\arctan\left(ax\right)^2+1}{4\left(a^5c^2x^2+a^3c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(2*a*x*arctan(a*x) - (a^2*x^2 + 1)*arctan(a*x)^2 + 1)/(a^5*c^2*x^2 + a
^3*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 59, normalized size = 0.92

$$-\frac{1}{4a^3c^2\left(a^2x^2+1\right)}-\frac{x\arctan\left(ax\right)}{2a^2c^2\left(a^2x^2+1\right)}+\frac{\arctan\left(ax\right)^2}{4a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/4/a^3/c^2/(a^2*x^2+1)-1/2*x*arctan(a*x)/a^2/c^2/(a^2*x^2+1)+1/4*arctan(a
*x)^2/a^3/c^2
```

maxima [A] time = 0.44, size = 83, normalized size = 1.30

$$-\frac{1}{2}\left(\frac{x}{a^4c^2x^2+a^2c^2}-\frac{\arctan\left(ax\right)}{a^3c^2}\right)\arctan\left(ax\right)-\frac{\left(\left(a^2x^2+1\right)\arctan\left(ax\right)^2+1\right)a}{4\left(a^6c^2x^2+a^4c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] -1/2*(x/(a^4*c^2*x^2 + a^2*c^2) - arctan(a*x)/(a^3*c^2))*arctan(a*x) - 1/4*
((a^2*x^2 + 1)*arctan(a*x)^2 + 1)*a/(a^6*c^2*x^2 + a^4*c^2)
```

mupad [B] time = 0.40, size = 48, normalized size = 0.75

$$\frac{a^2\,x^2\,\mathrm{atan}\left(a\,x\right)^2-2\,a\,x\,\mathrm{atan}\left(a\,x\right)+\mathrm{atan}\left(a\,x\right)^2-1}{4\,a^3\,c^2\,\left(a^2\,x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x))/(c + a^2*c*x^2)^2,x)
```

```
[Out] (atan(a*x)^2 - 2*a*x*atan(a*x) + a^2*x^2*atan(a*x)^2 - 1)/(4*a^3*c^2*(a^2*x
^2 + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2 \operatorname{atan}(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**2*atan(a*x)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.186 $\int \frac{x\tan^{-1}(ax)}{(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=62

$$\frac{x}{4ac^2(a^2x^2+1)}-\frac{\tan^{-1}(ax)}{2a^2c^2(a^2x^2+1)}+\frac{\tan^{-1}(ax)}{4a^2c^2}$$

```
[Out] 1/4*x/a/c^2/(a^2*x^2+1)+1/4*arctan(a*x)/a^2/c^2-1/2*arctan(a*x)/a^2/c^2/(a^
2*x^2+1)
```

Rubi [A] time = 0.04, antiderivative size = 62, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4930, 199, 205}

$$\frac{x}{4ac^2(a^2x^2+1)}-\frac{\tan^{-1}(ax)}{2a^2c^2(a^2x^2+1)}+\frac{\tan^{-1}(ax)}{4a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
```

```
[Out] x/(4*a*c^2*(1 + a^2*x^2)) + ArcTan[a*x]/(4*a^2*c^2) - ArcTan[a*x]/(2*a^2*c^
2*(1 + a^2*x^2))
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\tan^{-1}(ax)}{(c+a^2cx^2)^2}\,dx &= -\frac{\tan^{-1}(ax)}{2a^2c^2(1+a^2x^2)}+\frac{\int \frac{1}{(c+a^2cx^2)^2}\,dx}{2a}\\ &= \frac{x}{4ac^2(1+a^2x^2)}-\frac{\tan^{-1}(ax)}{2a^2c^2(1+a^2x^2)}+\frac{\int \frac{1}{c+a^2cx^2}\,dx}{4ac}\\ &= \frac{x}{4ac^2(1+a^2x^2)}+\frac{\tan^{-1}(ax)}{4a^2c^2}-\frac{\tan^{-1}(ax)}{2a^2c^2(1+a^2x^2)}\end{aligned}$$

Mathematica [A] time = 0.03, size = 39, normalized size = 0.63

$$\frac{\left(a^2x^2-1\right)\tan^{-1}(ax)+ax}{4a^2c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]
[Out] (a*x + (-1 + a^2*x^2)*ArcTan[a*x])/(4*a^2*c^2*(1 + a^2*x^2))
```

fricas [A] time = 0.50, size = 40, normalized size = 0.65

$$\frac{ax+\left(a^2x^2-1\right)\arctan\left(ax\right)}{4\left(a^4c^2x^2+a^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
[Out] 1/4*(a*x + (a^2*x^2 - 1)*arctan(a*x))/(a^4*c^2*x^2 + a^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.03, size = 57, normalized size = 0.92

$$\frac{x}{4a\,c^2\left(a^2x^2+1\right)}+\frac{\arctan\left(ax\right)}{4a^2c^2}-\frac{\arctan\left(ax\right)}{2a^2c^2\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)/(a^2*c*x^2+c)^2,x)
[Out] 1/4*x/a/c^2/(a^2*x^2+1)+1/4*arctan(a*x)/a^2/c^2-1/2*arctan(a*x)/a^2/c^2/(a^
2*x^2+1)
```

maxima [A] time = 0.43, size = 59, normalized size = 0.95

$$\frac{\frac{x}{a^2cx^2+c}+\frac{\arctan(ax)}{ac}}{4\,ac}-\frac{\arctan\left(ax\right)}{2\left(a^2cx^2+c\right)a^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
[Out] 1/4*(x/(a^2*c*x^2 + c) + arctan(a*x)/(a*c))/(a*c) - 1/2*arctan(a*x)/((a^2*c
*x^2 + c)*a^2*c)
```

mupad [B] time = 0.17, size = 40, normalized size = 0.65

$$\frac{a\,x-\mathrm{atan}\left(a\,x\right)+a^2\,x^2\,\mathrm{atan}\left(a\,x\right)}{4\,a^2\,c^2\,\left(a^2\,x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x))/(c + a^2*c*x^2)^2,x)
```

```
[Out] (a*x - atan(a*x) + a^2*x^2*atan(a*x))/(4*a^2*c^2*(a^2*x^2 + 1))
```

sympy [A] time = 1.42, size = 107, normalized size = 1.73

$$\begin{cases} \frac{a^2x^2\operatorname{atan}(ax)}{4a^4c^2x^2+4a^2c^2} + \frac{ax}{4a^4c^2x^2+4a^2c^2} - \frac{\operatorname{atan}(ax)}{4a^4c^2x^2+4a^2c^2} & \text{for } c \neq 0 \\ \tilde{\infty}\left(\frac{x^2\operatorname{atan}(ax)}{2} - \frac{x}{2a} + \frac{\operatorname{atan}(ax)}{2a^2}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Piecewise((a**2*x**2*atan(a*x)/(4*a**4*c**2*x**2 + 4*a**2*c**2) + a*x/(4*a*
*4*c**2*x**2 + 4*a**2*c**2) - atan(a*x)/(4*a**4*c**2*x**2 + 4*a**2*c**2), N
e(c, 0)), (zoo*(x**2*atan(a*x)/2 - x/(2*a) + atan(a*x)/(2*a**2)), True))
```

3.187 $\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=61

$$\frac{1}{4ac^2\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^2}{4ac^2}$$

```
[Out] 1/4/a/c^2/(a^2*x^2+1)+1/2*x*arctan(a*x)/c^2/(a^2*x^2+1)+1/4*arctan(a*x)^2/a
/c^2
```

Rubi [A] time = 0.03, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.118, Rules used = {4892, 261}

$$\frac{1}{4ac^2\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^2}{4ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(c + a^2*c*x^2)^2,x]
```

```
[Out] 1/(4*a*c^2*(1 + a^2*x^2)) + (x*ArcTan[a*x])/(2*c^2*(1 + a^2*x^2)) + ArcTan[
a*x]^2/(4*a*c^2)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx &= \frac{x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^2}{4ac^2}-\frac{1}{2}a\int \frac{x}{\left(c+a^2cx^2\right)^2}\,dx\\ &= \frac{1}{4ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^2}{4ac^2}\end{aligned}$$

Mathematica [A] time = 0.02, size = 44, normalized size = 0.72

$$\frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^2+2ax\tan^{-1}(ax)+1}{4c^2\left(a^3x^2+a\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(c + a^2*c*x^2)^2,x]
```

```
[Out] (1 + 2*a*x*ArcTan[a*x] + (1 + a^2*x^2)*ArcTan[a*x]^2)/(4*c^2*(a + a^3*x^2))
```

fricas [A] time = 0.53, size = 46, normalized size = 0.75

$$\frac{2\,ax\arctan\left(ax\right)+\left(a^{2}x^{2}+1\right)\arctan\left(ax\right)^{2}+1}{4\left(a^{3}c^{2}x^{2}+ac^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*x*arctan(a*x) + (a^2*x^2 + 1)*arctan(a*x)^2 + 1)/(a^3*c^2*x^2 + a*
c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 56, normalized size = 0.92

$$\frac{1}{4a\,c^{2}\left(a^{2}x^{2}+1\right)}+\frac{x\arctan\left(ax\right)}{2c^{2}\left(a^{2}x^{2}+1\right)}+\frac{\arctan\left(ax\right)^{2}}{4a\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/4/a/c^2/(a^2*x^2+1)+1/2*x*arctan(a*x)/c^2/(a^2*x^2+1)+1/4*arctan(a*x)^2/a
/c^2
```

maxima [A] time = 0.43, size = 78, normalized size = 1.28

$$\frac{1}{2}\left(\frac{x}{a^{2}c^{2}x^{2}+c^{2}}+\frac{\arctan\left(ax\right)}{ac^{2}}\right)\arctan\left(ax\right)-\frac{\left(\left(a^{2}x^{2}+1\right)\arctan\left(ax\right)^{2}-1\right)a}{4\left(a^{4}c^{2}x^{2}+a^{2}c^{2}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(x/(a^2*c^2*x^2 + c^2) + arctan(a*x)/(a*c^2))*arctan(a*x) - 1/4*((a^2*x
^2 + 1)*arctan(a*x)^2 - 1)*a/(a^4*c^2*x^2 + a^2*c^2)
```

mupad [B] time = 0.42, size = 48, normalized size = 0.79

$$\frac{a^{2}\,x^{2}\,\mathrm{atan}\left(a\,x\right)^{2}+2\,a\,x\,\mathrm{atan}\left(a\,x\right)+\mathrm{atan}\left(a\,x\right)^{2}+1}{4\,a\,c^{2}\,\left(a^{2}\,x^{2}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + a^2*c*x^2)^2,x)
```

```
[Out] (atan(a*x)^2 + 2*a*x*atan(a*x) + a^2*x^2*atan(a*x)^2 + 1)/(4*a*c^2*(a^2*x^2
 + 1))
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Exception raised: RecursionError
```

3.188 $\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=117

$$-\frac{ax}{4c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}-\frac{i\mathrm{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c^2}-\frac{i\tan^{-1}(ax)^2}{2c^2}-\frac{\tan^{-1}(ax)}{4c^2}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c^2}$$

```
[Out] -1/4*a*x/c^2/(a^2*x^2+1)-1/4*arctan(a*x)/c^2+1/2*arctan(a*x)/c^2/(a^2*x^2+1
)-1/2*I*arctan(a*x)^2/c^2+arctan(a*x)*ln(2-2/(1-I*a*x))/c^2-1/2*I*polylog(2
,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.18, antiderivative size = 117, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4966, 4924, 4868, 2447, 4930, 199, 205}

$$-\frac{i\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^2}-\frac{ax}{4c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}-\frac{i\tan^{-1}(ax)^2}{2c^2}-\frac{\tan^{-1}(ax)}{4c^2}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x*(c + a^2*c*x^2)^2),x]
```

```
[Out] -(a*x)/(4*c^2*(1 + a^2*x^2)) - ArcTan[a*x]/(4*c^2) + ArcTan[a*x]/(2*c^2*(1
+ a^2*x^2)) - ((I/2)*ArcTan[a*x]^2)/c^2 + (ArcTan[a*x]*Log[2 - 2/(1 - I*a*x
)])/c^2 - ((I/2)*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^2
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^2}\,dx &= -\left(a^2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)}\,dx}{c}\\
&= \frac{\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2c^2}-\frac{1}{2}a\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx+\frac{i\int \frac{\tan^{-1}(ax)}{x(i+ax)}\,dx}{c^2}\\
&= -\frac{ax}{4c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2c^2}+\frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{c^2}-\frac{a\int \frac{\log(}{1}\cdots}{\cdots}\\
&= -\frac{ax}{4c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)}{4c^2}+\frac{\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2c^2}+\frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1-ia\cdots}\right.}{c^2}\cdots
\end{aligned}$$

Mathematica [A] time = 0.17, size = 72, normalized size = 0.62

$$-\frac{4i\text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)+4i\tan^{-1}(ax)^2+\sin\left(2\tan^{-1}(ax)\right)-2\tan^{-1}(ax)\left(\cos\left(2\tan^{-1}(ax)\right)+4\log\left(1-e^{2i\tan^{-1}(a\cdots}\right.\right.}{8c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x*(c + a^2*c*x^2)^2),x]
```

```
[Out] -1/8*((4*I)*ArcTan[a*x]^2 - 2*ArcTan[a*x]*(Cos[2*ArcTan[a*x]] + 4*Log[1 - E
^((2*I)*ArcTan[a*x])]) + (4*I)*PolyLog[2, E^((2*I)*ArcTan[a*x])] + Sin[2*Ar
cTan[a*x]])/c^2
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)}{a^4c^2x^5+2a^2c^2x^3+c^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)/(a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.12, size = 298, normalized size = 2.55

$$\frac{\arctan(ax)\ln(ax)}{c^2} - \frac{\arctan(ax)\ln\left(a^2x^2+1\right)}{2c^2} + \frac{\arctan(ax)}{2c^2\left(a^2x^2+1\right)} - \frac{ax}{4c^2\left(a^2x^2+1\right)} - \frac{\arctan(ax)}{4c^2} - \frac{i\,\mathrm{dilog}(-iax+1)}{2c^2} -$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/c^2*arctan(a*x)*ln(a*x)-1/2/c^2*arctan(a*x)*ln(a^2*x^2+1)+1/2*arctan(a*x)
/c^2/(a^2*x^2+1)-1/4*a*x/c^2/(a^2*x^2+1)-1/4*arctan(a*x)/c^2-1/4*I/c^2*dilo
g(1/2*I*(a*x-I))-1/8*I/c^2*ln(I+a*x)^2+1/4*I/c^2*ln(a*x-I)*ln(-1/2*I*(I+a*x
))+1/2*I/c^2*ln(a*x)*ln(1+I*a*x)+1/4*I/c^2*ln(I+a*x)*ln(a^2*x^2+1)-1/2*I/c^
2*dilog(1-I*a*x)+1/4*I/c^2*dilog(-1/2*I*(I+a*x))-1/2*I/c^2*ln(a*x)*ln(1-I*a
*x)+1/8*I/c^2*ln(a*x-I)^2-1/4*I/c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))-1/4*I/c^2*l
n(a*x-I)*ln(a^2*x^2+1)+1/2*I/c^2*dilog(1+I*a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)}{x\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)/(x*(c + a^2*c*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x/(a**2*c*x**2+c)**2,x)
```

```
[Out] Timed out
```

3.189 $\int \frac{\tan^{-1}(ax)}{x^2(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=97

$$-\frac{a}{4c^2(a^2x^2+1)}-\frac{a\log(a^2x^2+1)}{2c^2}-\frac{a^2x\tan^{-1}(ax)}{2c^2(a^2x^2+1)}+\frac{a\log(x)}{c^2}-\frac{3a\tan^{-1}(ax)^2}{4c^2}-\frac{\tan^{-1}(ax)}{c^2x}$$

```
[Out] -1/4*a/c^2/(a^2*x^2+1)-arctan(a*x)/c^2/x-1/2*a^2*x*arctan(a*x)/c^2/(a^2*x^2
+1)-3/4*a*arctan(a*x)^2/c^2+a*ln(x)/c^2-1/2*a*ln(a^2*x^2+1)/c^2
```

Rubi [A] time = 0.16, antiderivative size = 97, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4966, 4918, 4852, 266, 36, 29, 31, 4884, 4892, 261}

$$-\frac{a}{4c^2(a^2x^2+1)}-\frac{a\log(a^2x^2+1)}{2c^2}-\frac{a^2x\tan^{-1}(ax)}{2c^2(a^2x^2+1)}+\frac{a\log(x)}{c^2}-\frac{3a\tan^{-1}(ax)^2}{4c^2}-\frac{\tan^{-1}(ax)}{c^2x}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^2),x]
```

```
[Out] -a/(4*c^2*(1 + a^2*x^2)) - ArcTan[a*x]/(c^2*x) - (a^2*x*ArcTan[a*x])/(2*c^2
*(1 + a^2*x^2)) - (3*a*ArcTan[a*x]^2)/(4*c^2) + (a*Log[x])/c^2 - (a*Log[1 +
 a^2*x^2])/(2*c^2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
```

```
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{a^2x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{a\tan^{-1}(ax)^2}{4c^2}+\frac{1}{2}a^3\int \frac{x}{\left(c+a^2cx^2\right)^2}\,dx+\frac{\int \frac{\tan^{-1}(ax)}{x^2}\,dx}{c^2}-\frac{a^2\int \frac{\tan^{-1}(ax)}{c+a^2cx^2}}{c}$$

$$= -\frac{a}{4c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)}{c^2x}-\frac{a^2x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{3a\tan^{-1}(ax)^2}{4c^2}+\frac{a\int \frac{1}{x\left(1+a^2x^2\right)}\,dx}{c^2}$$

$$= -\frac{a}{4c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)}{c^2x}-\frac{a^2x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{3a\tan^{-1}(ax)^2}{4c^2}+\frac{a\,\mathrm{Subst}\left(\int \frac{1}{x\left(1+a^2x\right)}\,dx,\right.}{2c^2}$$

$$= -\frac{a}{4c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)}{c^2x}-\frac{a^2x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{3a\tan^{-1}(ax)^2}{4c^2}+\frac{a\,\mathrm{Subst}\left(\int \frac{1}{x}\,dx,x,x^2\right)}{2c^2}$$

$$= -\frac{a}{4c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)}{c^2x}-\frac{a^2x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{3a\tan^{-1}(ax)^2}{4c^2}+\frac{a\log(x)}{c^2}-\frac{a\log\left(1+a\right.}{2c^2}$$

Mathematica [A] time = 0.08, size = 94, normalized size = 0.97

$$-\frac{a}{4c^2\left(a^2x^2+1\right)}-\frac{a\log\left(a^2x^2+1\right)}{2c^2}-\frac{\left(3a^2x^2+2\right)\tan^{-1}(ax)}{2c^2x\left(a^2x^2+1\right)}+\frac{a\log(x)}{c^2}-\frac{3a\tan^{-1}(ax)^2}{4c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^2),x]
```

```
[Out] -1/4*a/(c^2*(1 + a^2*x^2)) - ((2 + 3*a^2*x^2)*ArcTan[a*x])/(2*c^2*x*(1 + a^
2*x^2)) - (3*a*ArcTan[a*x]^2)/(4*c^2) + (a*Log[x])/c^2 - (a*Log[1 + a^2*x^2
])/(2*c^2)
```

fricas [A] time = 0.49, size = 97, normalized size = 1.00

$$-\frac{3\left(a^3x^3+ax\right)\arctan(ax)^2+ax+2\left(3a^2x^2+2\right)\arctan(ax)+2\left(a^3x^3+ax\right)\log\left(a^2x^2+1\right)-4\left(a^3x^3+ax\right)\log}{4\left(a^2c^2x^3+c^2x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(3*(a^3*x^3 + a*x)*arctan(a*x)^2 + a*x + 2*(3*a^2*x^2 + 2)*arctan(a*x)
 + 2*(a^3*x^3 + a*x)*log(a^2*x^2 + 1) - 4*(a^3*x^3 + a*x)*log(x))/(a^2*c^2*
x^3 + c^2*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 92, normalized size = 0.95

$$-\frac{\arctan(ax)}{c^2x}-\frac{a^2x\arctan(ax)}{2c^2\left(a^2x^2+1\right)}-\frac{3a\arctan(ax)^2}{4c^2}+\frac{a\ln(ax)}{c^2}-\frac{a\ln\left(a^2x^2+1\right)}{2c^2}-\frac{a}{4c^2\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^2/(a^2*c*x^2+c)^2,x)
```

```
[Out] -arctan(a*x)/c^2/x-1/2*a^2*x*arctan(a*x)/c^2/(a^2*x^2+1)-3/4*a*arctan(a*x)^
2/c^2+a/c^2*ln(a*x)-1/2*a*ln(a^2*x^2+1)/c^2-1/4*a/c^2/(a^2*x^2+1)
```

maxima [A] time = 0.44, size = 119, normalized size = 1.23

$$-\frac{1}{2}\left(\frac{3a^2x^2+2}{a^2c^2x^3+c^2x}+\frac{3a\arctan(ax)}{c^2}\right)\arctan(ax)+\frac{\left(3\left(a^2x^2+1\right)\arctan(ax)^2-2\left(a^2x^2+1\right)\log\left(a^2x^2+1\right)+4\right.}{4\left(a^2c^2x^2+c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] -1/2*((3*a^2*x^2 + 2)/(a^2*c^2*x^3 + c^2*x) + 3*a*arctan(a*x)/c^2)*arctan(a
*x) + 1/4*(3*(a^2*x^2 + 1)*arctan(a*x)^2 - 2*(a^2*x^2 + 1)*log(a^2*x^2 + 1)
 + 4*(a^2*x^2 + 1)*log(x) - 1)*a/(a^2*c^2*x^2 + c^2)
```

mupad [B] time = 0.48, size = 91, normalized size = 0.94

$$\frac{a\ \ln(x)}{c^2}-\frac{a\ \ln\left(a^2\,x^2+1\right)}{2\,c^2}-\frac{\mathrm{atan}\left(a\,x\right)\,\left(\frac{1}{a^2\,c^2}+\frac{3\,x^2}{2\,c^2}\right)}{\frac{x}{a^2}+x^3}-\frac{a}{2\,\left(2\,a^2\,c^2\,x^2+2\,c^2\right)}-\frac{3\,a\,\mathrm{atan}\left(a\,x\right)^2}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^2),x)
```

```
[Out] (a*log(x))/c^2 - (a*log(a^2*x^2 + 1))/(2*c^2) - (atan(a*x)*(1/(a^2*c^2) + (
3*x^2)/(2*c^2)))/(x/a^2 + x^3) - a/(2*(2*c^2 + 2*a^2*c^2*x^2)) - (3*a*atan(
a*x)^2)/(4*c^2)
```

sympy [B] time = 1.42, size = 272, normalized size = 2.80

$$\frac{4a^3x^3\log\left(x\right)}{4a^2c^2x^3+4c^2x}-\frac{2a^3x^3\log\left(x^2+\frac{1}{a^2}\right)}{4a^2c^2x^3+4c^2x}-\frac{3a^3x^3\,\mathrm{atan}^2\left(ax\right)}{4a^2c^2x^3+4c^2x}-\frac{6a^2x^2\,\mathrm{atan}\left(ax\right)}{4a^2c^2x^3+4c^2x}+\frac{4ax\log\left(x\right)}{4a^2c^2x^3+4c^2x}-\frac{2ax\log\left(x^2+\frac{1}{a^2}\right)}{4a^2c^2x^3+4c^2x}-\frac{3\ldots}{4\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**2/(a**2*c*x**2+c)**2,x)
```

```
[Out] 4*a**3*x**3*log(x)/(4*a**2*c**2*x**3 + 4*c**2*x) - 2*a**3*x**3*log(x**2 + a
**(-2))/(4*a**2*c**2*x**3 + 4*c**2*x) - 3*a**3*x**3*atan(a*x)**2/(4*a**2*c*
*2*x**3 + 4*c**2*x) - 6*a**2*x**2*atan(a*x)/(4*a**2*c**2*x**3 + 4*c**2*x) +
 4*a*x*log(x)/(4*a**2*c**2*x**3 + 4*c**2*x) - 2*a*x*log(x**2 + a**(-2))/(4*
a**2*c**2*x**3 + 4*c**2*x) - 3*a*x*atan(a*x)**2/(4*a**2*c**2*x**3 + 4*c**2*
x) - a*x/(4*a**2*c**2*x**3 + 4*c**2*x) - 4*atan(a*x)/(4*a**2*c**2*x**3 + 4*
c**2*x)
```

3.190 $\int \frac{\tan^{-1}(ax)}{x^3(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=156

$$\frac{ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{c^2}-\frac{a^2\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}+\frac{ia^2\tan^{-1}(ax)^2}{c^2}-\frac{a^2\tan^{-1}(ax)}{4c^2}-\frac{2a^2\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c^2}+\frac{a^3x}{4c^2\left(a^2x^2+1\right.}$$

```
[Out] -1/2*a/c^2/x+1/4*a^3*x/c^2/(a^2*x^2+1)-1/4*a^2*arctan(a*x)/c^2-1/2*arctan(a
*x)/c^2/x^2-1/2*a^2*arctan(a*x)/c^2/(a^2*x^2+1)+I*a^2*arctan(a*x)^2/c^2-2*a
^2*arctan(a*x)*ln(2-2/(1-I*a*x))/c^2+I*a^2*polylog(2,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.41, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4966, 4918, 4852, 325, 203, 4924, 4868, 2447, 4930, 199, 205}

$$\frac{ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^2}+\frac{a^3x}{4c^2\left(a^2x^2+1\right)}-\frac{a^2\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}+\frac{ia^2\tan^{-1}(ax)^2}{c^2}-\frac{a^2\tan^{-1}(ax)}{4c^2}-\frac{2a^2\log\left(2-\frac{2}{1-iax}\right.}{c^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)^2),x]
```

```
[Out] -a/(2*c^2*x) + (a^3*x)/(4*c^2*(1 + a^2*x^2)) - (a^2*ArcTan[a*x])/(4*c^2) -
ArcTan[a*x]/(2*c^2*x^2) - (a^2*ArcTan[a*x])/(2*c^2*(1 + a^2*x^2)) + (I*a^2*
ArcTan[a*x]^2)/c^2 - (2*a^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/c^2 + (I*a^
2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^2
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^3\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)}{x^3\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= a^4\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)}{x^3}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)}{2c^2x^2} - \frac{a^2\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{1}{2}a^3\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx + \frac{a\int \frac{1}{x^2\left(1+a^2x^2\right)}\,dx}{2c^2} - 2\left(-\frac{ia^2\,\mathrm{ta}\cdots\right.$$

$$= -\frac{a}{2c^2x} + \frac{a^3x}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{2c^2x^2} - \frac{a^2\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{a^3\int \frac{1}{1+a^2x^2}\,dx}{2c^2} - 2\left(-\frac{ia^2\tan^{-}\cdots}{2c\cdots}\right.$$

$$= -\frac{a}{2c^2x} + \frac{a^3x}{4c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{4c^2} - \frac{\tan^{-1}(ax)}{2c^2x^2} - \frac{a^2\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - 2\left(-\frac{ia^2\tan^{-1}\cdots}{2c^2}\right.$$

Mathematica [A] time = 0.42, size = 93, normalized size = 0.60

$$\frac{a^2\left(\tan^{-1}(ax)\left(-\frac{4}{a^2x^2} - 16\log\left(1-e^{2i\tan^{-1}(ax)}\right) - 2\cos\left(2\tan^{-1}(ax)\right) - 4\right) + 8i\mathrm{Li}_2\left(e^{2i\tan^{-1}(ax)}\right) - \frac{4}{ax} + 8i\tan^{-1}(\cdots\right.}{8c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)^2),x]
```

```
[Out] (a^2*(-4/(a*x) + (8*I)*ArcTan[a*x]^2 + ArcTan[a*x]*(-4 - 4/(a^2*x^2) - 2*Co
s[2*ArcTan[a*x]] - 16*Log[1 - E^((2*I)*ArcTan[a*x])]) + (8*I)*PolyLog[2, E^
((2*I)*ArcTan[a*x])] + Sin[2*ArcTan[a*x]]))/(8*c^2)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)}{a^4c^2x^7 + 2\,a^2c^2x^5 + c^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)/(a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 369, normalized size = 2.37

$$-\frac{\arctan(ax)}{2c^2x^2} - \frac{2a^2\arctan(ax)\ln(ax)}{c^2} + \frac{a^2\arctan(ax)\ln\left(a^2x^2+1\right)}{c^2} - \frac{a^2\arctan(ax)}{2c^2\left(a^2x^2+1\right)} - \frac{ia^2\,\mathrm{dilog}(iax+1)}{c^2} - \frac{ia^2\ln\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^3/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/2*arctan(a*x)/c^2/x^2-2*a^2/c^2*arctan(a*x)*ln(a*x)+a^2/c^2*arctan(a*x)*
ln(a^2*x^2+1)-1/2*a^2*arctan(a*x)/c^2/(a^2*x^2+1)+I*a^2/c^2*dilog(1-I*a*x)-
1/2*I*a^2/c^2*ln(I+a*x)*ln(a^2*x^2+1)-1/2*I*a^2/c^2*ln(a*x-I)*ln(-1/2*I*(I+
a*x))+1/4*I*a^2/c^2*ln(I+a*x)^2-1/4*I*a^2/c^2*ln(a*x-I)^2-I*a^2/c^2*ln(a*x)
*ln(1+I*a*x)+1/2*I*a^2/c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))+I*a^2/c^2*ln(a*x)*ln
(1-I*a*x)+1/2*I*a^2/c^2*ln(a*x-I)*ln(a^2*x^2+1)+1/2*I*a^2/c^2*dilog(1/2*I*(
a*x-I))-I*a^2/c^2*dilog(1+I*a*x)-1/2*I*a^2/c^2*dilog(-1/2*I*(I+a*x))-1/2*a/
c^2/x+1/4*a^3*x/c^2/(a^2*x^2+1)-1/4*a^2*arctan(a*x)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^2*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)}{x^3\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\mathrm{atan}(ax)}{a^4x^7+2a^2x^5+x^3}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**3/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)/(a**4*x**7 + 2*a**2*x**5 + x**3), x)/c**2
```

3.191 $\int \frac{\tan^{-1}(ax)}{x^4(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=136

$$-\frac{7a^3\log(x)}{3c^2}+\frac{5a^3\tan^{-1}(ax)^2}{4c^2}+\frac{2a^2\tan^{-1}(ax)}{c^2x}+\frac{a^4x\tan^{-1}(ax)}{2c^2(a^2x^2+1)}+\frac{a^3}{4c^2(a^2x^2+1)}+\frac{7a^3\log(a^2x^2+1)}{6c^2}-\frac{\tan^{-1}(ax)}{3c^2x^3}$$

```
[Out] -1/6*a/c^2/x^2+1/4*a^3/c^2/(a^2*x^2+1)-1/3*arctan(a*x)/c^2/x^3+2*a^2*arctan
(a*x)/c^2/x+1/2*a^4*x*arctan(a*x)/c^2/(a^2*x^2+1)+5/4*a^3*arctan(a*x)^2/c^2
-7/3*a^3*ln(x)/c^2+7/6*a^3*ln(a^2*x^2+1)/c^2
```

Rubi [A] time = 0.37, antiderivative size = 136, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4966, 4918, 4852, 266, 44, 36, 29, 31, 4884, 4892, 261}

$$\frac{a^3}{4c^2(a^2x^2+1)}+\frac{7a^3\log(a^2x^2+1)}{6c^2}+\frac{a^4x\tan^{-1}(ax)}{2c^2(a^2x^2+1)}-\frac{7a^3\log(x)}{3c^2}+\frac{5a^3\tan^{-1}(ax)^2}{4c^2}+\frac{2a^2\tan^{-1}(ax)}{c^2x}-\frac{a}{6c^2x^2}-\frac{\tan^{-}}{3c^{}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)^2),x]
```

```
[Out] -a/(6*c^2*x^2) + a^3/(4*c^2*(1 + a^2*x^2)) - ArcTan[a*x]/(3*c^2*x^3) + (2*a
^2*ArcTan[a*x])/(c^2*x) + (a^4*x*ArcTan[a*x])/(2*c^2*(1 + a^2*x^2)) + (5*a^
3*ArcTan[a*x]^2)/(4*c^2) - (7*a^3*Log[x])/(3*c^2) + (7*a^3*Log[1 + a^2*x^2]
)/(6*c^2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^4\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)}{x^4\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= a^4\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)}{x^4}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^2}{4c^2} - \frac{1}{2}a^5\int \frac{x}{\left(c+a^2cx^2\right)^2}\,dx + \frac{a\int \frac{1}{x^3\left(1+a^2x\right.}}{3c^2}$$

$$= \frac{a^3}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^2}{4c^2} + \frac{a\,\mathrm{Subst}\left(\int \frac{1}{x^2\left(1+a^2x\right)}\right.}{6c^2}$$

$$= \frac{a^3}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^2}{4c^2} + \frac{a\,\mathrm{Subst}\left(\int\left(\frac{1}{x^2} - \frac{a^2}{x} +\right.\right.}{6c^2}$$

$$= -\frac{a}{6c^2x^2} + \frac{a^3}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^2}{4c^2} - \frac{a^3\log(x)}{3c^2} +$$

$$= -\frac{a}{6c^2x^2} + \frac{a^3}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^2}{4c^2} - \frac{a^3\log(x)}{3c^2} +$$

Mathematica [A] time = 0.10, size = 124, normalized size = 0.91

$$-\frac{7a^3\log(x)}{3c^2}+\frac{5a^3\tan^{-1}(ax)^2}{4c^2}+\frac{\left(15a^4x^4+10a^2x^2-2\right)\tan^{-1}(ax)}{6c^2x^3\left(a^2x^2+1\right)}+\frac{a^3}{4c^2\left(a^2x^2+1\right)}+\frac{7a^3\log\left(a^2x^2+1\right)}{6c^2}-\frac{a}{6c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)^2),x]
```

```
[Out] -1/6*a/(c^2*x^2) + a^3/(4*c^2*(1 + a^2*x^2)) + ((-2 + 10*a^2*x^2 + 15*a^4*x
^4)*ArcTan[a*x])/(6*c^2*x^3*(1 + a^2*x^2)) + (5*a^3*ArcTan[a*x]^2)/(4*c^2)
- (7*a^3*Log[x])/(3*c^2) + (7*a^3*Log[1 + a^2*x^2])/(6*c^2)
```

fricas [A] time = 0.51, size = 127, normalized size = 0.93

$$\frac{a^3x^3+15\left(a^5x^5+a^3x^3\right)\arctan(ax)^2-2\,ax+2\left(15\,a^4x^4+10\,a^2x^2-2\right)\arctan(ax)+14\left(a^5x^5+a^3x^3\right)\log\left(a^2\right.}{12\left(a^2c^2x^5+c^2x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] 1/12*(a^3*x^3 + 15*(a^5*x^5 + a^3*x^3)*arctan(a*x)^2 - 2*a*x + 2*(15*a^4*x^
4 + 10*a^2*x^2 - 2)*arctan(a*x) + 14*(a^5*x^5 + a^3*x^3)*log(a^2*x^2 + 1) -
 28*(a^5*x^5 + a^3*x^3)*log(x))/(a^2*c^2*x^5 + c^2*x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 125, normalized size = 0.92

$$-\frac{\arctan(ax)}{3c^2x^3}+\frac{2a^2\arctan(ax)}{c^2x}+\frac{a^4x\arctan(ax)}{2c^2\left(a^2x^2+1\right)}+\frac{5a^3\arctan(ax)^2}{4c^2}-\frac{a}{6c^2x^2}-\frac{7a^3\ln(ax)}{3c^2}+\frac{7a^3\ln\left(a^2x^2+1\right)}{6c^2}+\frac{}{4c^2\left(\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^4/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/3*arctan(a*x)/c^2/x^3+2*a^2*arctan(a*x)/c^2/x+1/2*a^4*x*arctan(a*x)/c^2/
(a^2*x^2+1)+5/4*a^3*arctan(a*x)^2/c^2-1/6*a/c^2/x^2-7/3*a^3/c^2*ln(a*x)+7/6
*a^3*ln(a^2*x^2+1)/c^2+1/4*a^3/c^2/(a^2*x^2+1)
```

maxima [A] time = 0.45, size = 160, normalized size = 1.18

$$\frac{1}{6}\left(\frac{15\,a^3\arctan(ax)}{c^2}+\frac{15\,a^4x^4+10\,a^2x^2-2}{a^2c^2x^5+c^2x^3}\right)\arctan(ax)+\frac{\left(a^2x^2-15\left(a^4x^4+a^2x^2\right)\arctan(ax)^2+14\left(a^4x^4+a^2\right.\right.}{12\left(a^2c^2x^4\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] 1/6*(15*a^3*arctan(a*x)/c^2 + (15*a^4*x^4 + 10*a^2*x^2 - 2)/(a^2*c^2*x^5 +
c^2*x^3))*arctan(a*x) + 1/12*(a^2*x^2 - 15*(a^4*x^4 + a^2*x^2)*arctan(a*x)^
2 + 14*(a^4*x^4 + a^2*x^2)*log(a^2*x^2 + 1) - 28*(a^4*x^4 + a^2*x^2)*log(x)
 - 2)*a/(a^2*c^2*x^4 + c^2*x^2)
```

mupad [B] time = 0.55, size = 123, normalized size = 0.90

$$\frac{\mathrm{atan}(a\,x)\left(\frac{5\,x^2}{3\,c^2}-\frac{1}{3\,a^2\,c^2}+\frac{5\,a^2\,x^4}{2\,c^2}\right)}{x^5+\frac{x^3}{a^2}}-\frac{a-\frac{a^3\,x^2}{2}}{6\,a^2\,c^2\,x^4+6\,c^2\,x^2}+\frac{7\,a^3\,\ln\left(a^2\,x^2+1\right)}{6\,c^2}-\frac{7\,a^3\,\ln(x)}{3\,c^2}+\frac{5\,a^3\,\mathrm{atan}(a\,x)^2}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^4*(c + a^2*c*x^2)^2),x)
```

```
[Out] (atan(a*x)*((5*x^2)/(3*c^2) - 1/(3*a^2*c^2) + (5*a^2*x^4)/(2*c^2)))/(x^5 +
x^3/a^2) - (a - (a^3*x^2)/2)/(6*c^2*x^2 + 6*a^2*c^2*x^4) + (7*a^3*log(a^2*x
^2 + 1))/(6*c^2) - (7*a^3*log(x))/(3*c^2) + (5*a^3*atan(a*x)^2)/(4*c^2)
```

sympy [B] time = 2.16, size = 360, normalized size = 2.65

$$-\frac{28a^5x^5\log(x)}{12a^2c^2x^5+12c^2x^3}+\frac{14a^5x^5\log\left(x^2+\frac{1}{a^2}\right)}{12a^2c^2x^5+12c^2x^3}+\frac{15a^5x^5\,\mathrm{atan}^2(ax)}{12a^2c^2x^5+12c^2x^3}+\frac{30a^4x^4\,\mathrm{atan}(ax)}{12a^2c^2x^5+12c^2x^3}-\frac{28a^3x^3\log(x)}{12a^2c^2x^5+12c^2x^3}+\frac{14a^3x^3}{12a^2c^}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**4/(a**2*c*x**2+c)**2,x)
```

```
[Out] -28*a**5*x**5*log(x)/(12*a**2*c**2*x**5 + 12*c**2*x**3) + 14*a**5*x**5*log(
x**2 + a**(-2))/(12*a**2*c**2*x**5 + 12*c**2*x**3) + 15*a**5*x**5*atan(a*x)
**2/(12*a**2*c**2*x**5 + 12*c**2*x**3) + 30*a**4*x**4*atan(a*x)/(12*a**2*c*
*2*x**5 + 12*c**2*x**3) - 28*a**3*x**3*log(x)/(12*a**2*c**2*x**5 + 12*c**2*
x**3) + 14*a**3*x**3*log(x**2 + a**(-2))/(12*a**2*c**2*x**5 + 12*c**2*x**3)
```

```
 + 15*a**3*x**3*atan(a*x)**2/(12*a**2*c**2*x**5 + 12*c**2*x**3) + a**3*x**3
/(12*a**2*c**2*x**5 + 12*c**2*x**3) + 20*a**2*x**2*atan(a*x)/(12*a**2*c**2*
x**5 + 12*c**2*x**3) - 2*a*x/(12*a**2*c**2*x**5 + 12*c**2*x**3) - 4*atan(a*
x)/(12*a**2*c**2*x**5 + 12*c**2*x**3)
```

3.192 $\int \frac{x^3 \tan^{-1}(ax)}{(c+a^2cx^2)^3} \, dx$

Optimal. Leaf size=86

$$-\frac{3\tan^{-1}(ax)}{32a^4c^3}+\frac{x^4\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}+\frac{x^3}{16ac^3\left(a^2x^2+1\right)^2}+\frac{3x}{32a^3c^3\left(a^2x^2+1\right)}$$

```
[Out] 1/16*x^3/a/c^3/(a^2*x^2+1)^2+3/32*x/a^3/c^3/(a^2*x^2+1)-3/32*arctan(a*x)/a^
4/c^3+1/4*x^4*arctan(a*x)/c^3/(a^2*x^2+1)^2
```

Rubi [A] time = 0.07, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4944, 288, 205}

$$\frac{x^3}{16ac^3\left(a^2x^2+1\right)^2}+\frac{3x}{32a^3c^3\left(a^2x^2+1\right)}+\frac{x^4\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}-\frac{3\tan^{-1}(ax)}{32a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^3,x]
```

```
[Out] x^3/(16*a*c^3*(1 + a^2*x^2)^2) + (3*x)/(32*a^3*c^3*(1 + a^2*x^2)) - (3*ArcT
an[a*x])/(32*a^4*c^3) + (x^4*ArcTan[a*x])/(4*c^3*(1 + a^2*x^2)^2)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)}{\left(c + a^2cx^2\right)^3} dx = \frac{x^4 \tan^{-1}(ax)}{4c^3\left(1 + a^2x^2\right)^2} - \frac{1}{4}a \int \frac{x^4}{\left(c + a^2cx^2\right)^3} dx$$
$$= \frac{x^3}{16ac^3\left(1 + a^2x^2\right)^2} + \frac{x^4 \tan^{-1}(ax)}{4c^3\left(1 + a^2x^2\right)^2} - \frac{3\int \frac{x^2}{\left(c+a^2cx^2\right)^2} dx}{16ac}$$
$$= \frac{x^3}{16ac^3\left(1 + a^2x^2\right)^2} + \frac{3x}{32a^3c^3\left(1 + a^2x^2\right)} + \frac{x^4 \tan^{-1}(ax)}{4c^3\left(1 + a^2x^2\right)^2} - \frac{3\int \frac{1}{c+a^2cx^2} dx}{32a^3c^2}$$
$$= \frac{x^3}{16ac^3\left(1 + a^2x^2\right)^2} + \frac{3x}{32a^3c^3\left(1 + a^2x^2\right)} - \frac{3\tan^{-1}(ax)}{32a^4c^3} + \frac{x^4 \tan^{-1}(ax)}{4c^3\left(1 + a^2x^2\right)^2}$$

Mathematica [A] time = 0.16, size = 58, normalized size = 0.67

$$\frac{ax\left(5a^2x^2 + 3\right) + \left(5a^4x^4 - 6a^2x^2 - 3\right)\tan^{-1}(ax)}{32a^4c^3\left(a^2x^2 + 1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (a*x*(3 + 5*a^2*x^2) + (-3 - 6*a^2*x^2 + 5*a^4*x^4)*ArcTan[a*x])/(32*a^4*c^
3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.61, size = 69, normalized size = 0.80

$$\frac{5\,a^3x^3 + 3\,ax + \left(5\,a^4x^4 - 6\,a^2x^2 - 3\right)\arctan\left(ax\right)}{32\left(a^8c^3x^4 + 2\,a^6c^3x^2 + a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/32*(5*a^3*x^3 + 3*a*x + (5*a^4*x^4 - 6*a^2*x^2 - 3)*arctan(a*x))/(a^8*c^3
*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 102, normalized size = 1.19

$$\frac{\arctan\left(ax\right)}{4a^4c^3\left(a^2x^2+1\right)^2} - \frac{\arctan\left(ax\right)}{2a^4c^3\left(a^2x^2+1\right)} + \frac{5x^3}{32a\,c^3\left(a^2x^2+1\right)^2} + \frac{3x}{32a^3c^3\left(a^2x^2+1\right)^2} + \frac{5\arctan\left(ax\right)}{32a^4c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)/(a^2*c*x^2+c)^3,x)
```

[Out] 1/4/a^4/c^3*arctan(a*x)/(a^2*x^2+1)^2-1/2*arctan(a*x)/a^4/c^3/(a^2*x^2+1)+5
/32*x^3/a/c^3/(a^2*x^2+1)^2+3/32/a^3/c^3/(a^2*x^2+1)^2*x+5/32*arctan(a*x)/a
^4/c^3

maxima [A] time = 0.42, size = 108, normalized size = 1.26

$$\frac{1}{32}\,a\left(\frac{5\,a^2x^3+3\,x}{a^8c^3x^4+2\,a^6c^3x^2+a^4c^3}+\frac{5\,\arctan\left(ax\right)}{a^5c^3}\right)-\frac{\left(2\,a^2x^2+1\right)\arctan\left(ax\right)}{4\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="maxima")

[Out] 1/32*a*((5*a^2*x^3 + 3*x)/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3) + 5*arcta
n(a*x)/(a^5*c^3)) - 1/4*(2*a^2*x^2 + 1)*arctan(a*x)/(a^8*c^3*x^4 + 2*a^6*c^
3*x^2 + a^4*c^3)

mupad [B] time = 0.50, size = 62, normalized size = 0.72

$$\frac{3\,a\,x-3\,\mathrm{atan}\left(a\,x\right)+5\,a^3\,x^3-6\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)+5\,a^4\,x^4\,\mathrm{atan}\left(a\,x\right)}{32\,a^4\,c^3\,{\left(a^2\,x^2+1\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^3*atan(a*x))/(c + a^2*c*x^2)^3,x)

[Out] (3*a*x - 3*atan(a*x) + 5*a^3*x^3 - 6*a^2*x^2*atan(a*x) + 5*a^4*x^4*atan(a*x
))/(32*a^4*c^3*(a^2*x^2 + 1)^2)

sympy [A] time = 2.69, size = 243, normalized size = 2.83

$$\begin{cases}\frac{5a^4x^4\operatorname{atan}(ax)}{32a^8c^3x^4+64a^6c^3x^2+32a^4c^3}+\frac{5a^3x^3}{32a^8c^3x^4+64a^6c^3x^2+32a^4c^3}-\frac{6a^2x^2\operatorname{atan}(ax)}{32a^8c^3x^4+64a^6c^3x^2+32a^4c^3}+\frac{3ax}{32a^8c^3x^4+64a^6c^3x^2+32a^4c^3}-\frac{3\operatorname{atan}(ax}{32a^8c^3x^4+64a^6c^3x} \\ \tilde{\infty}\left(\frac{x^4\operatorname{atan}(ax)}{4}-\frac{x^3}{12a}+\frac{x}{4a^3}-\frac{\operatorname{atan}(ax)}{4a^4}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**3*atan(a*x)/(a**2*c*x**2+c)**3,x)

[Out] Piecewise((5*a**4*x**4*atan(a*x)/(32*a**8*c**3*x**4 + 64*a**6*c**3*x**2 + 3
2*a**4*c**3) + 5*a**3*x**3/(32*a**8*c**3*x**4 + 64*a**6*c**3*x**2 + 32*a**4
*c**3) - 6*a**2*x**2*atan(a*x)/(32*a**8*c**3*x**4 + 64*a**6*c**3*x**2 + 32*
a**4*c**3) + 3*a*x/(32*a**8*c**3*x**4 + 64*a**6*c**3*x**2 + 32*a**4*c**3) -
 3*atan(a*x)/(32*a**8*c**3*x**4 + 64*a**6*c**3*x**2 + 32*a**4*c**3), Ne(c,
0)), (zoo*(x**4*atan(a*x)/4 - x**3/(12*a) + x/(4*a**3) - atan(a*x)/(4*a**4)
), True))

3.193 $\int \frac{x^2 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=111

$$\frac{\tan^{-1}(ax)^2}{16a^3c^3}+\frac{x\tan^{-1}(ax)}{8a^2c^3\left(a^2x^2+1\right)}-\frac{x\tan^{-1}(ax)}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{1}{16a^3c^3\left(a^2x^2+1\right)}-\frac{1}{16a^3c^3\left(a^2x^2+1\right)^2}$$

```
[Out] -1/16/a^3/c^3/(a^2*x^2+1)^2+1/16/a^3/c^3/(a^2*x^2+1)-1/4*x*arctan(a*x)/a^2/
c^3/(a^2*x^2+1)^2+1/8*x*arctan(a*x)/a^2/c^3/(a^2*x^2+1)+1/16*arctan(a*x)^2/
a^3/c^3
```

Rubi [A] time = 0.07, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4934, 4892, 261}

$$\frac{1}{16a^3c^3\left(a^2x^2+1\right)}-\frac{1}{16a^3c^3\left(a^2x^2+1\right)^2}+\frac{x\tan^{-1}(ax)}{8a^2c^3\left(a^2x^2+1\right)}-\frac{x\tan^{-1}(ax)}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(ax)^2}{16a^3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^3,x]
```

```
[Out] -1/(16*a^3*c^3*(1 + a^2*x^2)^2) + 1/(16*a^3*c^3*(1 + a^2*x^2)) - (x*ArcTan[
a*x])/(4*a^2*c^3*(1 + a^2*x^2)^2) + (x*ArcTan[a*x])/(8*a^2*c^3*(1 + a^2*x^2
)) + ArcTan[a*x]^2/(16*a^3*c^3)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4934

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^2*((d_) + (e_.)*(x_)^2)^(q_), x
_Symbol] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c^3*d*(q + 1)^2), x] + (-Dist[
1/(2*c^2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] +
Simp[(x*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*c^2*d*(q + 1)), x]) /;
FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -5/2]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{1}{16a^3c^3\left(1+a^2x^2\right)^2} - \frac{x\tan^{-1}(ax)}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{4a^2c}$$

$$= -\frac{1}{16a^3c^3\left(1+a^2x^2\right)^2} - \frac{x\tan^{-1}(ax)}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)}{8a^2c^3\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^2}{16a^3c^3} - \frac{\int \frac{x}{\left(c+a^2cx^2\right)^2}\,dx}{8ac}$$

$$= -\frac{1}{16a^3c^3\left(1+a^2x^2\right)^2} + \frac{1}{16a^3c^3\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)}{8a^2c^3\left(1+a^2x^2\right)} + \frac{\tan^{-1}(a}{16a^3c}$$

Mathematica [A] time = 0.06, size = 64, normalized size = 0.58

$$\frac{a^2x^2+2ax\left(a^2x^2-1\right)\tan^{-1}(ax)+\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}{16a^3c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (a^2*x^2 + 2*a*x*(-1 + a^2*x^2)*ArcTan[a*x] + (1 + a^2*x^2)^2*ArcTan[a*x]^2
)/(16*a^3*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.47, size = 83, normalized size = 0.75

$$\frac{a^2x^2+\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^2+2\left(a^3x^3-ax\right)\arctan\left(ax\right)}{16\left(a^7c^3x^4+2\,a^5c^3x^2+a^3c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(a^2*x^2 + (a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^2 + 2*(a^3*x^3 - a*x)
*arctan(a*x))/(a^7*c^3*x^4 + 2*a^5*c^3*x^2 + a^3*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 101, normalized size = 0.91

$$\frac{\arctan\left(ax\right)x^3}{8c^3\left(a^2x^2+1\right)^2} - \frac{x\arctan\left(ax\right)}{8a^2c^3\left(a^2x^2+1\right)^2} + \frac{\arctan\left(ax\right)^2}{16a^3c^3} - \frac{1}{16a^3c^3\left(a^2x^2+1\right)^2} + \frac{1}{16a^3c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/8/c^3*arctan(a*x)/(a^2*x^2+1)^2*x^3-1/8*x*arctan(a*x)/a^2/c^3/(a^2*x^2+1)
^2+1/16*arctan(a*x)^2/a^3/c^3-1/16/a^3/c^3/(a^2*x^2+1)^2+1/16/a^3/c^3/(a^2*
x^2+1)
```

maxima [A] time = 0.44, size = 129, normalized size = 1.16

$$\frac{1}{8}\left(\frac{a^2x^3-x}{a^6c^3x^4+2\,a^4c^3x^2+a^2c^3}+\frac{\arctan\left(ax\right)}{a^3c^3}\right)\arctan\left(ax\right)+\frac{\left(a^2x^2-\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^2\right)a}{16\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((a^2*x^3 - x)/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3) + arctan(a*x)/(a
^3*c^3))*arctan(a*x) + 1/16*(a^2*x^2 - (a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x
)^2)*a/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

mupad [B] time = 0.47, size = 80, normalized size = 0.72

$$\frac{a^4\,x^4\,\mathrm{atan}\left(a\,x\right)^2+2\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right)+2\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)^2+a^2\,x^2-2\,a\,x\,\mathrm{atan}\left(a\,x\right)+\mathrm{atan}\left(a\,x\right)^2}{16\,a^3\,c^3\,{\left(a^2\,x^2+1\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x))/(c + a^2*c*x^2)^3,x)
```

```
[Out] (a^2*x^2 + atan(a*x)^2 + 2*a^3*x^3*atan(a*x) - 2*a*x*atan(a*x) + 2*a^2*x^2*
atan(a*x)^2 + a^4*x^4*atan(a*x)^2)/(16*a^3*c^3*(a^2*x^2 + 1)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2\,\mathrm{atan}\,(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**2*atan(a*x)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c**
3
```

3.194 $\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=84

$$\frac{3x}{32ac^3\left(a^2x^2+1\right)}+\frac{x}{16ac^3\left(a^2x^2+1\right)^2}-\frac{\tan^{-1}(ax)}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)}{32a^2c^3}$$

```
[Out] 1/16*x/a/c^3/(a^2*x^2+1)^2+3/32*x/a/c^3/(a^2*x^2+1)+3/32*arctan(a*x)/a^2/c^
3-1/4*arctan(a*x)/a^2/c^3/(a^2*x^2+1)^2
```

Rubi [A] time = 0.05, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4930, 199, 205}

$$\frac{3x}{32ac^3\left(a^2x^2+1\right)}+\frac{x}{16ac^3\left(a^2x^2+1\right)^2}-\frac{\tan^{-1}(ax)}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)}{32a^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x])/(c + a^2*c*x^2)^3,x]
```

```
[Out] x/(16*a*c^3*(1 + a^2*x^2)^2) + (3*x)/(32*a*c^3*(1 + a^2*x^2)) + (3*ArcTan[a
*x])/(32*a^2*c^3) - ArcTan[a*x]/(4*a^2*c^3*(1 + a^2*x^2)^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\tan^{-1}(ax)}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx}{4a}$$

$$= \frac{x}{16ac^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{3\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx}{16ac}$$

$$= \frac{x}{16ac^3\left(1+a^2x^2\right)^2} + \frac{3x}{32ac^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{3\int \frac{1}{c+a^2cx^2}\,dx}{32ac^2}$$

$$= \frac{x}{16ac^3\left(1+a^2x^2\right)^2} + \frac{3x}{32ac^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)}{32a^2c^3} - \frac{\tan^{-1}(ax)}{4a^2c^3\left(1+a^2x^2\right)^2}$$

Mathematica [A] time = 0.05, size = 55, normalized size = 0.65

$$\frac{ax\left(3a^2x^2+5\right)+\left(3a^4x^4+6a^2x^2-5\right)\tan^{-1}(ax)}{32c^3\left(a^3x^2+a\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (a*x*(5 + 3*a^2*x^2) + (-5 + 6*a^2*x^2 + 3*a^4*x^4)*ArcTan[a*x])/(32*c^3*(a
 + a^3*x^2)^2)
```

fricas [A] time = 0.63, size = 69, normalized size = 0.82

$$\frac{3\,a^3x^3+5\,ax+\left(3\,a^4x^4+6\,a^2x^2-5\right)\arctan\left(ax\right)}{32\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/32*(3*a^3*x^3 + 5*a*x + (3*a^4*x^4 + 6*a^2*x^2 - 5)*arctan(a*x))/(a^6*c^3
*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 77, normalized size = 0.92

$$\frac{x}{16a\,c^3\left(a^2x^2+1\right)^2}+\frac{3x}{32a\,c^3\left(a^2x^2+1\right)}+\frac{3\arctan\left(ax\right)}{32a^2c^3}-\frac{\arctan\left(ax\right)}{4a^2c^3\left(a^2x^2+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/16*x/a/c^3/(a^2*x^2+1)^2+3/32*x/a/c^3/(a^2*x^2+1)+3/32*arctan(a*x)/a^2/c^
3-1/4*arctan(a*x)/a^2/c^3/(a^2*x^2+1)^2
```

maxima [A] time = 0.42, size = 86, normalized size = 1.02

$$\frac{\frac{3\,a^2x^3+5\,x}{a^4c^2x^4+2\,a^2c^2x^2+c^2}+\frac{3\,\arctan(ax)}{ac^2}}{32\,ac}-\frac{\arctan(ax)}{4\left(a^2cx^2+c\right)^2a^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/32*((3*a^2*x^3 + 5*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2) + 3*arctan(a*x)
/(a*c^2))/(a*c) - 1/4*arctan(a*x)/((a^2*c*x^2 + c)^2*a^2*c)
```

mupad [B] time = 0.48, size = 103, normalized size = 1.23

$$\frac{\frac{5\,x}{32\,a}+\frac{a\,x^3}{4}-\frac{\mathrm{atan}(a\,x)}{4\,a^2}-\frac{x^2\,\mathrm{atan}(a\,x)}{4}+\frac{3\,a^3\,x^5}{32}}{a^6\,c^3\,x^6+3\,a^4\,c^3\,x^4+3\,a^2\,c^3\,x^2+c^3}+\frac{3\,\mathrm{atan}\left(\frac{a^2\,x}{\sqrt{a^2}}\right)}{32\,a\,c^3\,\sqrt{a^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x))/(c + a^2*c*x^2)^3,x)
```

```
[Out] ((5*x)/(32*a) + (a*x^3)/4 - atan(a*x)/(4*a^2) - (x^2*atan(a*x))/4 + (3*a^3*
x^5)/32)/(c^3 + 3*a^2*c^3*x^2 + 3*a^4*c^3*x^4 + a^6*c^3*x^6) + (3*atan((a^2
*x)/(a^2)^(1/2)))/(32*a*c^3*(a^2)^(1/2))
```

sympy [A] time = 2.49, size = 235, normalized size = 2.80

$$\begin{cases}\frac{3a^4x^4\,\mathrm{atan}\,(ax)}{32a^6c^3x^4+64a^4c^3x^2+32a^2c^3}+\frac{3a^3x^3}{32a^6c^3x^4+64a^4c^3x^2+32a^2c^3}+\frac{6a^2x^2\,\mathrm{atan}\,(ax)}{32a^6c^3x^4+64a^4c^3x^2+32a^2c^3}+\frac{5ax}{32a^6c^3x^4+64a^4c^3x^2+32a^2c^3}-\frac{5\,\mathrm{atan}\,(ax}{32a^6c^3x^4+64a^4c^3x} \\ \tilde{\infty}\left(\frac{x^2\,\mathrm{atan}\,(ax)}{2}-\frac{x}{2a}+\frac{\mathrm{atan}\,(ax)}{2a^2}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Piecewise((3*a**4*x**4*atan(a*x)/(32*a**6*c**3*x**4 + 64*a**4*c**3*x**2 + 3
2*a**2*c**3) + 3*a**3*x**3/(32*a**6*c**3*x**4 + 64*a**4*c**3*x**2 + 32*a**2
*c**3) + 6*a**2*x**2*atan(a*x)/(32*a**6*c**3*x**4 + 64*a**4*c**3*x**2 + 32*
a**2*c**3) + 5*a*x/(32*a**6*c**3*x**4 + 64*a**4*c**3*x**2 + 32*a**2*c**3) -
 5*atan(a*x)/(32*a**6*c**3*x**4 + 64*a**4*c**3*x**2 + 32*a**2*c**3), Ne(c,
0)), (zoo*(x**2*atan(a*x)/2 - x/(2*a) + atan(a*x)/(2*a**2)), True))
```

3.195 $\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=105

$$\frac{3}{16ac^3\left(a^2x^2+1\right)}+\frac{1}{16ac^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)^2}{16ac^3}$$

```
[Out] 1/16/a/c^3/(a^2*x^2+1)^2+3/16/a/c^3/(a^2*x^2+1)+1/4*x*arctan(a*x)/c^3/(a^2*
x^2+1)^2+3/8*x*arctan(a*x)/c^3/(a^2*x^2+1)+3/16*arctan(a*x)^2/a/c^3
```

Rubi [A] time = 0.05, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {4896, 4892, 261}

$$\frac{3}{16ac^3\left(a^2x^2+1\right)}+\frac{1}{16ac^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)^2}{16ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(c + a^2*c*x^2)^3,x]
```

```
[Out] 1/(16*a*c^3*(1 + a^2*x^2)^2) + 3/(16*a*c^3*(1 + a^2*x^2)) + (x*ArcTan[a*x])
/(4*c^3*(1 + a^2*x^2)^2) + (3*x*ArcTan[a*x])/(8*c^3*(1 + a^2*x^2)) + (3*Arc
Tan[a*x]^2)/(16*a*c^3)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx = \frac{1}{16ac^3\left(1+a^2x^2\right)^2}+\frac{x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2}+\frac{3\int\frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{4c}$$

$$= \frac{1}{16ac^3\left(1+a^2x^2\right)^2}+\frac{x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)}+\frac{3\tan^{-1}(ax)^2}{16ac^3}-\frac{(3a)\int\frac{x}{\left(c+a^2cx^2\right)^2}\,dx}{8c}$$

$$= \frac{1}{16ac^3\left(1+a^2x^2\right)^2}+\frac{3}{16ac^3\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)}+\frac{3\tan^{-1}(ax)^2}{16ac^3}$$

Mathematica [A] time = 0.03, size = 68, normalized size = 0.65

$$\frac{3a^2x^2+2ax\left(3a^2x^2+5\right)\tan^{-1}(ax)+3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2+4}{16ac^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(c + a^2*c*x^2)^3,x]
```

```
[Out] (4 + 3*a^2*x^2 + 2*a*x*(5 + 3*a^2*x^2)*ArcTan[a*x] + 3*(1 + a^2*x^2)^2*ArcT
an[a*x]^2)/(16*a*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.46, size = 85, normalized size = 0.81

$$\frac{3\,a^2x^2+3\left(a^4x^4+2\,a^2x^2+1\right)\arctan(ax)^2+2\left(3\,a^3x^3+5\,ax\right)\arctan(ax)+4}{16\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/16*(3*a^2*x^2 + 3*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^2 + 2*(3*a^3*x^3
+ 5*a*x)*arctan(a*x) + 4)/(a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 96, normalized size = 0.91

$$\frac{1}{16a\,c^3\left(a^2x^2+1\right)^2}+\frac{3}{16a\,c^3\left(a^2x^2+1\right)}+\frac{x\arctan(ax)}{4c^3\left(a^2x^2+1\right)^2}+\frac{3x\arctan(ax)}{8c^3\left(a^2x^2+1\right)}+\frac{3\arctan(ax)^2}{16a\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/16/a/c^3/(a^2*x^2+1)^2+3/16/a/c^3/(a^2*x^2+1)+1/4*x*arctan(a*x)/c^3/(a^2*
x^2+1)^2+3/8*x*arctan(a*x)/c^3/(a^2*x^2+1)+3/16*arctan(a*x)^2/a/c^3
```

maxima [A] time = 0.43, size = 129, normalized size = 1.23

$$\frac{1}{8}\left(\frac{3\,a^2x^3+5\,x}{a^4c^3x^4+2\,a^2c^3x^2+c^3}+\frac{3\,\arctan\left(ax\right)}{ac^3}\right)\arctan\left(ax\right)+\frac{\left(3\,a^2x^2-3\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^2+4\right)a}{16\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((3*a^2*x^3 + 5*x)/(a^4*c^3*x^4 + 2*a^2*c^3*x^2 + c^3) + 3*arctan(a*x)/
(a*c^3))*arctan(a*x) + 1/16*(3*a^2*x^2 - 3*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan
(a*x)^2 + 4)*a/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)
```

mupad [B] time = 0.48, size = 85, normalized size = 0.81

$$\frac{3\,a^4\,x^4\,\mathrm{atan}\left(a\,x\right)^2+6\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right)+6\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)^2+3\,a^2\,x^2+10\,a\,x\,\mathrm{atan}\left(a\,x\right)+3\,\mathrm{atan}\left(a\,x\right)^2+4}{16\,a\,c^3\,{\left(a^2\,x^2+1\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + a^2*c*x^2)^3,x)
```

```
[Out] (3*a^2*x^2 + 3*atan(a*x)^2 + 6*a^3*x^3*atan(a*x) + 10*a*x*atan(a*x) + 6*a^2
*x^2*atan(a*x)^2 + 3*a^4*x^4*atan(a*x)^2 + 4)/(16*a*c^3*(a^2*x^2 + 1)^2)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Exception raised: RecursionError
```

3.196 $\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=159

$$-\frac{11ax}{32c^3\left(a^2x^2+1\right)}-\frac{ax}{16c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(ax)}{2c^3\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}-\frac{i\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c^3}-\frac{i\tan^{-1}(ax)^2}{2c^3}-\frac{11\tan^{-1}(ax}{32c^3}$$

```
[Out] -1/16*a*x/c^3/(a^2*x^2+1)^2-11/32*a*x/c^3/(a^2*x^2+1)-11/32*arctan(a*x)/c^3
+1/4*arctan(a*x)/c^3/(a^2*x^2+1)^2+1/2*arctan(a*x)/c^3/(a^2*x^2+1)-1/2*I*ar
ctan(a*x)^2/c^3+arctan(a*x)*ln(2-2/(1-I*a*x))/c^3-1/2*I*polylog(2,-1+2/(1-I
*a*x))/c^3
```

Rubi [A] time = 0.28, antiderivative size = 159, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4966, 4924, 4868, 2447, 4930, 199, 205}

$$-\frac{i\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^3}-\frac{11ax}{32c^3\left(a^2x^2+1\right)}-\frac{ax}{16c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(ax)}{2c^3\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}-\frac{i\tan^{-1}(ax)^2}{2c^3}-\frac{11}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] -(a*x)/(16*c^3*(1 + a^2*x^2)^2) - (11*a*x)/(32*c^3*(1 + a^2*x^2)) - (11*Arc
Tan[a*x])/(32*c^3) + ArcTan[a*x]/(4*c^3*(1 + a^2*x^2)^2) + ArcTan[a*x]/(2*c
^3*(1 + a^2*x^2)) - ((I/2)*ArcTan[a*x]^2)/c^3 + (ArcTan[a*x]*Log[2 - 2/(1 -
 I*a*x)])/c^3 - ((I/2)*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^3
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^3}\,dx &= -\left(a^2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^2}\,dx}{c}\\
&= \frac{\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2}-\frac{1}{4}a\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx+\frac{\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)}\,dx}{c^2}-\frac{a^2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{c}\\
&= -\frac{ax}{16c^3\left(1+a^2x^2\right)^2}+\frac{\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2}+\frac{\tan^{-1}(ax)}{2c^3\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2c^3}+\frac{i\int \frac{\tan^{-1}(ax)}{x(i+ax)}\,dx}{c^3}\\
&= -\frac{ax}{16c^3\left(1+a^2x^2\right)^2}-\frac{11ax}{32c^3\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2}+\frac{\tan^{-1}(ax)}{2c^3\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^2}{2c^3}\\
&= -\frac{ax}{16c^3\left(1+a^2x^2\right)^2}-\frac{11ax}{32c^3\left(1+a^2x^2\right)}-\frac{11\tan^{-1}(ax)}{32c^3}+\frac{\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2}+\frac{\tan^{-1}(ax)}{2c^3\left(1+a^2x^2\right.}
\end{aligned}$$

Mathematica [A] time = 0.24, size = 90, normalized size = 0.57

$$-\frac{64i\mathrm{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)+64i\tan^{-1}(ax)^2+24\sin\left(2\tan^{-1}(ax)\right)+\sin\left(4\tan^{-1}(ax)\right)-4\tan^{-1}(ax)\left(32\log\left(1-e^{2i}\right.\right.}{128c^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] -1/128*((64*I)*ArcTan[a*x]^2 - 4*ArcTan[a*x]*(12*Cos[2*ArcTan[a*x]] + Cos[4
*ArcTan[a*x]] + 32*Log[1 - E^((2*I)*ArcTan[a*x])]) + (64*I)*PolyLog[2, E^((
2*I)*ArcTan[a*x])] + 24*Sin[2*ArcTan[a*x]] + Sin[4*ArcTan[a*x]])/c^3
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)}{a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)/(a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x),
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.11, size = 340, normalized size = 2.14

$$\frac{\arctan(ax)\ln(ax)}{c^3}-\frac{\arctan(ax)\ln\left(a^2x^2+1\right)}{2c^3}+\frac{\arctan(ax)}{4c^3\left(a^2x^2+1\right)^2}+\frac{\arctan(ax)}{2c^3\left(a^2x^2+1\right)}-\frac{11x^3a^3}{32c^3\left(a^2x^2+1\right)^2}-\frac{13ax}{32c^3\left(a^2x^2+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/c^3*arctan(a*x)*ln(a*x)-1/2/c^3*arctan(a*x)*ln(a^2*x^2+1)+1/4*arctan(a*x)
/c^3/(a^2*x^2+1)^2+1/2*arctan(a*x)/c^3/(a^2*x^2+1)-11/32/c^3/(a^2*x^2+1)^2*
x^3*a^3-13/32*a*x/c^3/(a^2*x^2+1)^2-11/32*arctan(a*x)/c^3+1/4*I/c^3*ln(I+a*
x)*ln(a^2*x^2+1)-1/2*I/c^3*dilog(1-I*a*x)-1/4*I/c^3*ln(a*x-I)*ln(a^2*x^2+1)
+1/8*I/c^3*ln(a*x-I)^2-1/2*I/c^3*ln(a*x)*ln(1-I*a*x)-1/8*I/c^3*ln(I+a*x)^2+
1/4*I/c^3*ln(a*x-I)*ln(-1/2*I*(I+a*x))+1/4*I/c^3*dilog(-1/2*I*(I+a*x))+1/2*
I/c^3*ln(a*x)*ln(1+I*a*x)-1/4*I/c^3*dilog(1/2*I*(a*x-I))-1/4*I/c^3*ln(I+a*x
)*ln(1/2*I*(a*x-I))+1/2*I/c^3*dilog(1+I*a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)^3x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)}{x\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)/(x*(c + a^2*c*x^2)^3), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RecursionError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x/(a**2*c*x**2+c)**3,x)
```

```
[Out] Exception raised: RecursionError
```

3.197 $\int \frac{\tan^{-1}(ax)}{x^2(c+a^2cx^2)^3} dx$

Optimal. Leaf size=142

$$-\frac{7a}{16c^3(a^2x^2+1)}-\frac{a}{16c^3(a^2x^2+1)^2}-\frac{a\log(a^2x^2+1)}{2c^3}-\frac{7a^2x\tan^{-1}(ax)}{8c^3(a^2x^2+1)}-\frac{a^2x\tan^{-1}(ax)}{4c^3(a^2x^2+1)^2}+\frac{a\log(x)}{c^3}-\frac{15a\tan^{-1}(ax)^2}{16c^3}$$

```
[Out] -1/16*a/c^3/(a^2*x^2+1)^2-7/16*a/c^3/(a^2*x^2+1)-arctan(a*x)/c^3/x-1/4*a^2*
x*arctan(a*x)/c^3/(a^2*x^2+1)^2-7/8*a^2*x*arctan(a*x)/c^3/(a^2*x^2+1)-15/16
*a*arctan(a*x)^2/c^3+a*ln(x)/c^3-1/2*a*ln(a^2*x^2+1)/c^3
```

Rubi [A] time = 0.26, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4966, 4918, 4852, 266, 36, 29, 31, 4884, 4892, 261, 4896}

$$-\frac{7a}{16c^3(a^2x^2+1)}-\frac{a}{16c^3(a^2x^2+1)^2}-\frac{a\log(a^2x^2+1)}{2c^3}-\frac{7a^2x\tan^{-1}(ax)}{8c^3(a^2x^2+1)}-\frac{a^2x\tan^{-1}(ax)}{4c^3(a^2x^2+1)^2}+\frac{a\log(x)}{c^3}-\frac{15a\tan^{-1}(ax)^2}{16c^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^3),x]
```

```
[Out] -a/(16*c^3*(1 + a^2*x^2)^2) - (7*a)/(16*c^3*(1 + a^2*x^2)) - ArcTan[a*x]/(c
^3*x) - (a^2*x*ArcTan[a*x])/(4*c^3*(1 + a^2*x^2)^2) - (7*a^2*x*ArcTan[a*x])
/(8*c^3*(1 + a^2*x^2)) - (15*a*ArcTan[a*x]^2)/(16*c^3) + (a*Log[x])/c^3 - (
a*Log[1 + a^2*x^2])/(2*c^3)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{a}{16c^3\left(1+a^2x^2\right)^2} - \frac{a^2x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} + \frac{\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)}\,dx}{c^2} - \frac{\left(3a^2\right)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{4c} - \frac{a^2\int \frac{\tan}{(c+}}{c}$$

$$= -\frac{a}{16c^3\left(1+a^2x^2\right)^2} - \frac{a^2x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} - \frac{7a^2x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)} - \frac{7a\tan^{-1}(ax)^2}{16c^3} + \frac{\int \frac{\tan^{-1}(ax)}{x^2}\,dx}{c^3} -$$

$$= -\frac{a}{16c^3\left(1+a^2x^2\right)^2} - \frac{7a}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{c^3x} - \frac{a^2x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} - \frac{7a^2x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)} -$$

$$= -\frac{a}{16c^3\left(1+a^2x^2\right)^2} - \frac{7a}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{c^3x} - \frac{a^2x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} - \frac{7a^2x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)} -$$

$$= -\frac{a}{16c^3\left(1+a^2x^2\right)^2} - \frac{7a}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{c^3x} - \frac{a^2x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} - \frac{7a^2x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)} -$$

$$= -\frac{a}{16c^3\left(1+a^2x^2\right)^2} - \frac{7a}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{c^3x} - \frac{a^2x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} - \frac{7a^2x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)} -$$

Mathematica [A] time = 0.10, size = 118, normalized size = 0.83

$$\frac{ax\left(-7a^2x^2+16\left(a^2x^2+1\right)^2\log(x)-8\left(a^2x^2+1\right)^2\log\left(a^2x^2+1\right)-8\right)-15ax\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2-2\left(15a^4x^4\right.}{16c^3x\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^3),x]
```

```
[Out] (-2*(8 + 25*a^2*x^2 + 15*a^4*x^4)*ArcTan[a*x] - 15*a*x*(1 + a^2*x^2)^2*ArcT
an[a*x]^2 + a*x*(-8 - 7*a^2*x^2 + 16*(1 + a^2*x^2)^2*Log[x] - 8*(1 + a^2*x^
2)^2*Log[1 + a^2*x^2]))/(16*c^3*x*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.59, size = 149, normalized size = 1.05

$$-\frac{7\,a^3x^3+15\left(a^5x^5+2\,a^3x^3+ax\right)\arctan(ax)^2+8\,ax+2\left(15\,a^4x^4+25\,a^2x^2+8\right)\arctan(ax)+8\left(a^5x^5+2\,a^3x^3\right.}{16\left(a^4c^3x^5+2\,a^2c^3x^3+c^3x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] -1/16*(7*a^3*x^3 + 15*(a^5*x^5 + 2*a^3*x^3 + a*x)*arctan(a*x)^2 + 8*a*x + 2
*(15*a^4*x^4 + 25*a^2*x^2 + 8)*arctan(a*x) + 8*(a^5*x^5 + 2*a^3*x^3 + a*x)*
log(a^2*x^2 + 1) - 16*(a^5*x^5 + 2*a^3*x^3 + a*x)*log(x))/(a^4*c^3*x^5 + 2*
a^2*c^3*x^3 + c^3*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 135, normalized size = 0.95

$$-\frac{\arctan(ax)}{c^3x}-\frac{7\arctan(ax)\,a^4x^3}{8c^3\left(a^2x^2+1\right)^2}-\frac{9a^2x\arctan(ax)}{8c^3\left(a^2x^2+1\right)^2}-\frac{15a\arctan(ax)^2}{16c^3}+\frac{a\ln(ax)}{c^3}-\frac{a\ln\left(a^2x^2+1\right)}{2c^3}-\frac{a}{16c^3\left(a^2x^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^2/(a^2*c*x^2+c)^3,x)
```

```
[Out] -arctan(a*x)/c^3/x-7/8/c^3*arctan(a*x)/(a^2*x^2+1)^2*a^4*x^3-9/8*a^2*x*arct
an(a*x)/c^3/(a^2*x^2+1)^2-15/16*a*arctan(a*x)^2/c^3+a/c^3*ln(a*x)-1/2*a*ln(
a^2*x^2+1)/c^3-1/16*a/c^3/(a^2*x^2+1)^2-7/16*a/c^3/(a^2*x^2+1)
```

maxima [A] time = 0.44, size = 181, normalized size = 1.27

$$-\frac{1}{8}\left(\frac{15\,a^4x^4+25\,a^2x^2+8}{a^4c^3x^5+2\,a^2c^3x^3+c^3x}+\frac{15\,a\arctan(ax)}{c^3}\right)\arctan(ax)-\frac{\left(7\,a^2x^2-15\left(a^4x^4+2\,a^2x^2+1\right)\arctan(ax)^2+\right.}{1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] -1/8*((15*a^4*x^4 + 25*a^2*x^2 + 8)/(a^4*c^3*x^5 + 2*a^2*c^3*x^3 + c^3*x) +
 15*a*arctan(a*x)/c^3)*arctan(a*x) - 1/16*(7*a^2*x^2 - 15*(a^4*x^4 + 2*a^2*
x^2 + 1)*arctan(a*x)^2 + 8*(a^4*x^4 + 2*a^2*x^2 + 1)*log(a^2*x^2 + 1) - 16*
(a^4*x^4 + 2*a^2*x^2 + 1)*log(x) + 8)*a/(a^4*c^3*x^4 + 2*a^2*c^3*x^2 + c^3)
```

mupad [B] time = 0.57, size = 133, normalized size = 0.94

$$\frac{a\,\ln(x)}{c^3}-\frac{a\,\ln\left(a^2\,x^2+1\right)}{2\,c^3}-\frac{\frac{7\,a^3\,x^2}{2}+4\,a}{8\,a^4\,c^3\,x^4+16\,a^2\,c^3\,x^2+8\,c^3}-\frac{\mathrm{atan}(a\,x)\left(\frac{1}{a^2\,c^3}+\frac{25\,x^2}{8\,c^3}+\frac{15\,a^2\,x^4}{8\,c^3}\right)}{\frac{x}{a^2}+2\,x^3+a^2\,x^5}-\frac{15\,a\,\mathrm{atan}(a\,x)^2}{16\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] (a*log(x))/c^3 - (a*log(a^2*x^2 + 1))/(2*c^3) - (4*a + (7*a^3*x^2)/2)/(8*c^
3 + 16*a^2*c^3*x^2 + 8*a^4*c^3*x^4) - (atan(a*x)*(1/(a^2*c^3) + (25*x^2)/(8
*c^3) + (15*a^2*x^4)/(8*c^3)))/(x/a^2 + 2*x^3 + a^2*x^5) - (15*a*atan(a*x)^
2)/(16*c^3)
```

sympy [B] time = 2.51, size = 602, normalized size = 4.24

$$\frac{16a^5x^5\log(x)}{16a^4c^3x^5+32a^2c^3x^3+16c^3x}-\frac{8a^5x^5\log\left(x^2+\frac{1}{a^2}\right)}{16a^4c^3x^5+32a^2c^3x^3+16c^3x}-\frac{15a^5x^5\,\mathrm{atan}^2(ax)}{16a^4c^3x^5+32a^2c^3x^3+16c^3x}-\frac{30a^4x^4\,\mathrm{ata}}{16a^4c^3x^5+32a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**2/(a**2*c*x**2+c)**3,x)
```

```
[Out] 16*a**5*x**5*log(x)/(16*a**4*c**3*x**5 + 32*a**2*c**3*x**3 + 16*c**3*x) - 8
*a**5*x**5*log(x**2 + a**(-2))/(16*a**4*c**3*x**5 + 32*a**2*c**3*x**3 + 16*
c**3*x) - 15*a**5*x**5*atan(a*x)**2/(16*a**4*c**3*x**5 + 32*a**2*c**3*x**3
+ 16*c**3*x) - 30*a**4*x**4*atan(a*x)/(16*a**4*c**3*x**5 + 32*a**2*c**3*x**
```

```
3 + 16*c**3*x) + 32*a**3*x**3*log(x)/(16*a**4*c**3*x**5 + 32*a**2*c**3*x**3
 + 16*c**3*x) - 16*a**3*x**3*log(x**2 + a**(-2))/(16*a**4*c**3*x**5 + 32*a*
*2*c**3*x**3 + 16*c**3*x) - 30*a**3*x**3*atan(a*x)**2/(16*a**4*c**3*x**5 +
32*a**2*c**3*x**3 + 16*c**3*x) - 7*a**3*x**3/(16*a**4*c**3*x**5 + 32*a**2*c
**3*x**3 + 16*c**3*x) - 50*a**2*x**2*atan(a*x)/(16*a**4*c**3*x**5 + 32*a**2
*c**3*x**3 + 16*c**3*x) + 16*a*x*log(x)/(16*a**4*c**3*x**5 + 32*a**2*c**3*x
**3 + 16*c**3*x) - 8*a*x*log(x**2 + a**(-2))/(16*a**4*c**3*x**5 + 32*a**2*c
**3*x**3 + 16*c**3*x) - 15*a*x*atan(a*x)**2/(16*a**4*c**3*x**5 + 32*a**2*c*
*3*x**3 + 16*c**3*x) - 8*a*x/(16*a**4*c**3*x**5 + 32*a**2*c**3*x**3 + 16*c*
*3*x) - 16*atan(a*x)/(16*a**4*c**3*x**5 + 32*a**2*c**3*x**3 + 16*c**3*x)
```

3.198 $\int \frac{\tan^{-1}(ax)}{x^3(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=205

$$\frac{3ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c^3}-\frac{a^2\tan^{-1}(ax)}{c^3\left(a^2x^2+1\right)}-\frac{a^2\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}+\frac{3ia^2\tan^{-1}(ax)^2}{2c^3}+\frac{3a^2\tan^{-1}(ax)}{32c^3}-\frac{3a^2\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}}{c^3}$$

```
[Out] -1/2*a/c^3/x+1/16*a^3*x/c^3/(a^2*x^2+1)^2+19/32*a^3*x/c^3/(a^2*x^2+1)+3/32*
a^2*arctan(a*x)/c^3-1/2*arctan(a*x)/c^3/x^2-1/4*a^2*arctan(a*x)/c^3/(a^2*x^
2+1)^2-a^2*arctan(a*x)/c^3/(a^2*x^2+1)+3/2*I*a^2*arctan(a*x)^2/c^3-3*a^2*ar
ctan(a*x)*ln(2-2/(1-I*a*x))/c^3+3/2*I*a^2*polylog(2,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 0.76, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4966, 4918, 4852, 325, 203, 4924, 4868, 2447, 4930, 199, 205}

$$\frac{3ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^3}+\frac{19a^3x}{32c^3\left(a^2x^2+1\right)}+\frac{a^3x}{16c^3\left(a^2x^2+1\right)^2}-\frac{a^2\tan^{-1}(ax)}{c^3\left(a^2x^2+1\right)}-\frac{a^2\tan^{-1}(ax)}{4c^3\left(a^2x^2+1\right)^2}+\frac{3ia^2\tan^{-1}(}{2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)^3),x]
```

```
[Out] -a/(2*c^3*x) + (a^3*x)/(16*c^3*(1 + a^2*x^2)^2) + (19*a^3*x)/(32*c^3*(1 + a
^2*x^2)) + (3*a^2*ArcTan[a*x])/(32*c^3) - ArcTan[a*x]/(2*c^3*x^2) - (a^2*Ar
cTan[a*x])/(4*c^3*(1 + a^2*x^2)^2) - (a^2*ArcTan[a*x])/(c^3*(1 + a^2*x^2))
+ (((3*I)/2)*a^2*ArcTan[a*x]^2)/c^3 - (3*a^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a
*x)])/c^3 + (((3*I)/2)*a^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^3
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^3\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^3}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)}{x^3\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= a^4\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)}{x^3\left(c+a^2cx^2\right)}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{a^2\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} + \frac{1}{4}a^3\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)}{x^3}\,dx}{c^3} - \frac{a^2\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)}\,dx}{c^2} - 2\left(a\right.$$

$$= \frac{a^3x}{16c^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)}{2c^3x^2} - \frac{a^2\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} + \frac{ia^2\tan^{-1}(ax)^2}{2c^3} + \frac{a\int \frac{1}{x^2\left(1+a^2x^2\right)}\,dx}{2c^3} -$$

$$= -\frac{a}{2c^3x} + \frac{a^3x}{16c^3\left(1+a^2x^2\right)^2} + \frac{3a^3x}{32c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{2c^3x^2} - \frac{a^2\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} + \frac{ia^2\tan}{2c}$$

$$= -\frac{a}{2c^3x} + \frac{a^3x}{16c^3\left(1+a^2x^2\right)^2} + \frac{3a^3x}{32c^3\left(1+a^2x^2\right)} - \frac{13a^2\tan^{-1}(ax)}{32c^3} - \frac{\tan^{-1}(ax)}{2c^3x^2} - \frac{a^2\tan}{4c^3\left(1+\right.}$$

Mathematica [A] time = 0.63, size = 111, normalized size = 0.54

$$\frac{a^2\left(\tan^{-1}(ax)\left(-\frac{64}{a^2x^2} - 384\log\left(1-e^{2i\tan^{-1}(ax)}\right) - 80\cos\left(2\tan^{-1}(ax)\right) - 4\cos\left(4\tan^{-1}(ax)\right) - 64\right) + 192i\mathrm{Li}_2\left(\right.}{128c^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)^3),x]
```

```
[Out] (a^2*(-64/(a*x) + (192*I)*ArcTan[a*x]^2 + ArcTan[a*x]*(-64 - 64/(a^2*x^2) -
 80*Cos[2*ArcTan[a*x]] - 4*Cos[4*ArcTan[a*x]] - 384*Log[1 - E^((2*I)*ArcTan
[a*x])]) + (192*I)*PolyLog[2, E^((2*I)*ArcTan[a*x])] + 40*Sin[2*ArcTan[a*x]
] + Sin[4*ArcTan[a*x]]))/(128*c^3)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)}{a^6c^3x^9 + 3\,a^4c^3x^7 + 3\,a^2c^3x^5 + c^3x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)/(a^6*c^3*x^9 + 3*a^4*c^3*x^7 + 3*a^2*c^3*x^5 + c^3*x^3
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.13, size = 415, normalized size = 2.02

$$-\frac{\arctan(ax)}{2c^3x^2}-\frac{3a^2\arctan(ax)\ln(ax)}{c^3}+\frac{3a^2\arctan(ax)\ln\left(a^2x^2+1\right)}{2c^3}-\frac{a^2\arctan(ax)}{4c^3\left(a^2x^2+1\right)^2}-\frac{a^2\arctan(ax)}{c^3\left(a^2x^2+1\right)}-\frac{3ia^2\operatorname{dilog}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^3/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/2*arctan(a*x)/c^3/x^2-3*a^2/c^3*arctan(a*x)*ln(a*x)+3/2*a^2/c^3*arctan(a
*x)*ln(a^2*x^2+1)-1/4*a^2*arctan(a*x)/c^3/(a^2*x^2+1)^2-a^2*arctan(a*x)/c^3
/(a^2*x^2+1)+3/2*I*a^2/c^3*dilog(1-I*a*x)+3/4*I*a^2/c^3*dilog(1/2*I*(a*x-I)
)-3/2*I*a^2/c^3*ln(a*x)*ln(1+I*a*x)-3/2*I*a^2/c^3*dilog(1+I*a*x)+3/8*I*a^2/
c^3*ln(I+a*x)^2+3/2*I*a^2/c^3*ln(a*x)*ln(1-I*a*x)+3/4*I*a^2/c^3*ln(a*x-I)*l
n(a^2*x^2+1)+3/4*I*a^2/c^3*ln(I+a*x)*ln(1/2*I*(a*x-I))-3/4*I*a^2/c^3*ln(I+a
*x)*ln(a^2*x^2+1)-3/8*I*a^2/c^3*ln(a*x-I)^2-3/4*I*a^2/c^3*ln(a*x-I)*ln(-1/2
*I*(I+a*x))-3/4*I*a^2/c^3*dilog(-1/2*I*(I+a*x))-1/2*a/c^3/x+19/32*a^5/c^3/(
a^2*x^2+1)^2*x^3+21/32*a^3*x/c^3/(a^2*x^2+1)^2+3/32*a^2*arctan(a*x)/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^3*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)}{x^3\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}(ax)}{a^6x^9+3a^4x^7+3a^2x^5+x^3}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**3/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)/(a**6*x**9 + 3*a**4*x**7 + 3*a**2*x**5 + x**3), x)/c**3
```

3.199 $\int \frac{\tan^{-1}(ax)}{x^4(c+a^2cx^2)^3} dx$

Optimal. Leaf size=183

$$-\frac{10a^3\log(x)}{3c^3}+\frac{35a^3\tan^{-1}(ax)^2}{16c^3}+\frac{3a^2\tan^{-1}(ax)}{c^3x}+\frac{11a^4x\tan^{-1}(ax)}{8c^3(a^2x^2+1)}+\frac{a^4x\tan^{-1}(ax)}{4c^3(a^2x^2+1)^2}+\frac{11a^3}{16c^3(a^2x^2+1)}+\frac{a}{16c^3(a^2}$$

```
[Out] -1/6*a/c^3/x^2+1/16*a^3/c^3/(a^2*x^2+1)^2+11/16*a^3/c^3/(a^2*x^2+1)-1/3*arc
tan(a*x)/c^3/x^3+3*a^2*arctan(a*x)/c^3/x+1/4*a^4*x*arctan(a*x)/c^3/(a^2*x^2
+1)^2+11/8*a^4*x*arctan(a*x)/c^3/(a^2*x^2+1)+35/16*a^3*arctan(a*x)^2/c^3-10
/3*a^3*ln(x)/c^3+5/3*a^3*ln(a^2*x^2+1)/c^3
```

Rubi [A] time = 0.69, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 12, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4966, 4918, 4852, 266, 44, 36, 29, 31, 4884, 4892, 261, 4896}

$$\frac{11a^3}{16c^3(a^2x^2+1)}+\frac{a^3}{16c^3(a^2x^2+1)^2}+\frac{5a^3\log(a^2x^2+1)}{3c^3}+\frac{11a^4x\tan^{-1}(ax)}{8c^3(a^2x^2+1)}+\frac{a^4x\tan^{-1}(ax)}{4c^3(a^2x^2+1)^2}-\frac{10a^3\log(x)}{3c^3}+\frac{35a^3}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)^3),x]
```

```
[Out] -a/(6*c^3*x^2) + a^3/(16*c^3*(1 + a^2*x^2)^2) + (11*a^3)/(16*c^3*(1 + a^2*x
^2)) - ArcTan[a*x]/(3*c^3*x^3) + (3*a^2*ArcTan[a*x])/(c^3*x) + (a^4*x*ArcTa
n[a*x])/(4*c^3*(1 + a^2*x^2)^2) + (11*a^4*x*ArcTan[a*x])/(8*c^3*(1 + a^2*x^
2)) + (35*a^3*ArcTan[a*x]^2)/(16*c^3) - (10*a^3*Log[x])/(3*c^3) + (5*a^3*Lo
g[1 + a^2*x^2])/(3*c^3)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^4\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^3}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)}{x^4\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= a^4\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)}{x^4\left(c+a^2cx^2\right)}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= \frac{a^3}{16c^3\left(1+a^2x^2\right)^2} + \frac{a^4x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} + \frac{\int \frac{\tan^{-1}(ax)}{x^4}\,dx}{c^3} - \frac{a^2\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)}\,dx}{c^2} + \frac{\left(3a^4\right)\int \frac{\tan}{(c+}}{4c}$$

$$= \frac{a^3}{16c^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)}{3c^3x^3} + \frac{a^4x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} + \frac{3a^4x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)} + \frac{3a^3\tan^{-1}(ax)^2}{16c^3} +$$

$$= \frac{a^3}{16c^3\left(1+a^2x^2\right)^2} + \frac{3a^3}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^3x^3} + \frac{a^2\tan^{-1}(ax)}{c^3x} + \frac{a^4x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} +$$

$$= \frac{a^3}{16c^3\left(1+a^2x^2\right)^2} + \frac{3a^3}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^3x^3} + \frac{a^2\tan^{-1}(ax)}{c^3x} + \frac{a^4x\tan^{-1}(ax)}{4c^3\left(1+a^2x^2\right)^2} +$$

$$= -\frac{a}{6c^3x^2} + \frac{a^3}{16c^3\left(1+a^2x^2\right)^2} + \frac{3a^3}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^3x^3} + \frac{a^2\tan^{-1}(ax)}{c^3x} + \frac{a^4x\tan}{4c^3\left(1+\right.}$$

$$= -\frac{a}{6c^3x^2} + \frac{a^3}{16c^3\left(1+a^2x^2\right)^2} + \frac{3a^3}{16c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{3c^3x^3} + \frac{a^2\tan^{-1}(ax)}{c^3x} + \frac{a^4x\tan}{4c^3\left(1+\right.}$$

Mathematica [A] time = 0.13, size = 142, normalized size = 0.78

$$\frac{105a^3x^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2 + 2\left(105a^6x^6+175a^4x^4+56a^2x^2-8\right)\tan^{-1}(ax) + ax\left(25a^4x^4-160\left(a^3x^3+a\right.\right.}{48c^3x^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)^3),x]
```

```
[Out] (2*(-8 + 56*a^2*x^2 + 175*a^4*x^4 + 105*a^6*x^6)*ArcTan[a*x] + 105*a^3*x^3*
(1 + a^2*x^2)^2*ArcTan[a*x]^2 + a*x*(-8 + 20*a^2*x^2 + 25*a^4*x^4 - 160*(a*
x + a^3*x^3)^2*Log[x] + 80*(a*x + a^3*x^3)^2*Log[1 + a^2*x^2]))/(48*c^3*x^3
*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.68, size = 179, normalized size = 0.98

$$\frac{25\,a^5x^5 + 20\,a^3x^3 + 105\left(a^7x^7 + 2\,a^5x^5 + a^3x^3\right)\arctan(ax)^2 - 8\,ax + 2\left(105\,a^6x^6 + 175\,a^4x^4 + 56\,a^2x^2 - 8\right)\mathrm{ar}}{48\left(a^4c^3x^7 + 2\,a^2c^3x^5 + c^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/48*(25*a^5*x^5 + 20*a^3*x^3 + 105*(a^7*x^7 + 2*a^5*x^5 + a^3*x^3)*arctan(
a*x)^2 - 8*a*x + 2*(105*a^6*x^6 + 175*a^4*x^4 + 56*a^2*x^2 - 8)*arctan(a*x)
 + 80*(a^7*x^7 + 2*a^5*x^5 + a^3*x^3)*log(a^2*x^2 + 1) - 160*(a^7*x^7 + 2*a
^5*x^5 + a^3*x^3)*log(x))/(a^4*c^3*x^7 + 2*a^2*c^3*x^5 + c^3*x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 170, normalized size = 0.93

$$-\frac{\arctan(ax)}{3c^3x^3}+\frac{3a^2\arctan(ax)}{c^3x}+\frac{11a^6\arctan(ax)x^3}{8c^3\left(a^2x^2+1\right)^2}+\frac{13a^4x\arctan(ax)}{8c^3\left(a^2x^2+1\right)^2}+\frac{35a^3\arctan(ax)^2}{16c^3}-\frac{a}{6c^3x^2}-\frac{10a^3\ln(ax)}{3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^4/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/3*arctan(a*x)/c^3/x^3+3*a^2*arctan(a*x)/c^3/x+11/8*a^6/c^3*arctan(a*x)/(
a^2*x^2+1)^2*x^3+13/8*a^4*x*arctan(a*x)/c^3/(a^2*x^2+1)^2+35/16*a^3*arctan(
a*x)^2/c^3-1/6*a/c^3/x^2-10/3*a^3/c^3*ln(a*x)+5/3*a^3*ln(a^2*x^2+1)/c^3+1/1
6*a^3/c^3/(a^2*x^2+1)^2+11/16*a^3/c^3/(a^2*x^2+1)
```

maxima [A] time = 0.46, size = 223, normalized size = 1.22

$$\frac{1}{24}\left(\frac{105\,a^3\arctan(ax)}{c^3}+\frac{105\,a^6x^6+175\,a^4x^4+56\,a^2x^2-8}{a^4c^3x^7+2\,a^2c^3x^5+c^3x^3}\right)\arctan(ax)+\frac{\left(25\,a^4x^4+20\,a^2x^2-105\left(a^6x^6+2\,a^4x\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/24*(105*a^3*arctan(a*x)/c^3 + (105*a^6*x^6 + 175*a^4*x^4 + 56*a^2*x^2 - 8
)/(a^4*c^3*x^7 + 2*a^2*c^3*x^5 + c^3*x^3))*arctan(a*x) + 1/48*(25*a^4*x^4 +
 20*a^2*x^2 - 105*(a^6*x^6 + 2*a^4*x^4 + a^2*x^2)*arctan(a*x)^2 + 80*(a^6*x
^6 + 2*a^4*x^4 + a^2*x^2)*log(a^2*x^2 + 1) - 160*(a^6*x^6 + 2*a^4*x^4 + a^2
*x^2)*log(x) - 8)*a/(a^4*c^3*x^6 + 2*a^2*c^3*x^4 + c^3*x^2)
```

mupad [B] time = 0.59, size = 163, normalized size = 0.89

$$\frac{\frac{25\,a^5\,x^4}{2}+10\,a^3\,x^2-4\,a}{24\,a^4\,c^3\,x^6+48\,a^2\,c^3\,x^4+24\,c^3\,x^2}+\frac{\mathrm{atan}\left(a\,x\right)\,\left(\frac{7\,x^2}{3\,c^3}-\frac{1}{3\,a^2\,c^3}+\frac{175\,a^2\,x^4}{24\,c^3}+\frac{35\,a^4\,x^6}{8\,c^3}\right)}{2\,x^5+\frac{x^3}{a^2}+a^2\,x^7}+\frac{5\,a^3\,\ln\left(a^2\,x^2+1\right)}{3\,c^3}-\frac{10\,a^3\,\ln(x)}{3\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^4*(c + a^2*c*x^2)^3),x)
```

```
[Out] (10*a^3*x^2 - 4*a + (25*a^5*x^4)/2)/(24*c^3*x^2 + 48*a^2*c^3*x^4 + 24*a^4*c
^3*x^6) + (atan(a*x)*((7*x^2)/(3*c^3) - 1/(3*a^2*c^3) + (175*a^2*x^4)/(24*c
^3) + (35*a^4*x^6)/(8*c^3)))/(2*x^5 + x^3/a^2 + a^2*x^7) + (5*a^3*log(a^2*x
^2 + 1))/(3*c^3) - (10*a^3*log(x))/(3*c^3) + (35*a^3*atan(a*x)^2)/(16*c^3)
```

sympy [B] time = 3.65, size = 722, normalized size = 3.95

$$-\frac{160a^7x^7\log(x)}{48a^4c^3x^7+96a^2c^3x^5+48c^3x^3}+\frac{80a^7x^7\log\left(x^2+\frac{1}{a^2}\right)}{48a^4c^3x^7+96a^2c^3x^5+48c^3x^3}+\frac{105a^7x^7\,\mathrm{atan}^2(ax)}{48a^4c^3x^7+96a^2c^3x^5+48c^3x^3}+\frac{210a^6x^6}{48a^4c^3x^7+96}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**4/(a**2*c*x**2+c)**3,x)
```

```
[Out] -160*a**7*x**7*log(x)/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3
) + 80*a**7*x**7*log(x**2 + a**(-2))/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5
 + 48*c**3*x**3) + 105*a**7*x**7*atan(a*x)**2/(48*a**4*c**3*x**7 + 96*a**2*
c**3*x**5 + 48*c**3*x**3) + 210*a**6*x**6*atan(a*x)/(48*a**4*c**3*x**7 + 96
*a**2*c**3*x**5 + 48*c**3*x**3) - 320*a**5*x**5*log(x)/(48*a**4*c**3*x**7 +
 96*a**2*c**3*x**5 + 48*c**3*x**3) + 160*a**5*x**5*log(x**2 + a**(-2))/(48*
a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3) + 210*a**5*x**5*atan(a*x
)**2/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3) + 25*a**5*x**5/
(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3) + 350*a**4*x**4*atan
(a*x)/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3) - 160*a**3*x**
3*log(x)/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3) + 80*a**3*x
**3*log(x**2 + a**(-2))/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x*
*3) + 105*a**3*x**3*atan(a*x)**2/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 4
8*c**3*x**3) + 20*a**3*x**3/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**
3*x**3) + 112*a**2*x**2*atan(a*x)/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 +
48*c**3*x**3) - 8*a*x/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3
) - 16*atan(a*x)/(48*a**4*c**3*x**7 + 96*a**2*c**3*x**5 + 48*c**3*x**3)
```

3.200 $\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx$

Optimal. Leaf size=160

$$\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{15a^2}+\frac{1}{5}x^4\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)-\frac{x^3\sqrt{a^2cx^2+c}}{20a}-\frac{2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{15a^4}+\frac{11\sqrt{c}\,\tanh^{-1}\left(\frac{a}{\sqrt{a^2}}\right.}{120a^4}$$

```
[Out] 11/120*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))*c^(1/2)/a^4+1/24*x*(a^2*c*x
^2+c)^(1/2)/a^3-1/20*x^3*(a^2*c*x^2+c)^(1/2)/a-2/15*arctan(a*x)*(a^2*c*x^2+
c)^(1/2)/a^4+1/15*x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2+1/5*x^4*arctan(a*
x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4946, 4952, 321, 217, 206, 4930}

$$-\frac{x^3\sqrt{a^2cx^2+c}}{20a}+\frac{x\sqrt{a^2cx^2+c}}{24a^3}+\frac{1}{5}x^4\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)+\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{15a^2}-\frac{2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{15a^4}+$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] (x*Sqrt[c + a^2*c*x^2])/(24*a^3) - (x^3*Sqrt[c + a^2*c*x^2])/(20*a) - (2*Sq
rt[c + a^2*c*x^2]*ArcTan[a*x])/(15*a^4) + (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x])/(15*a^2) + (x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/5 + (11*Sqrt[c]*ArcTa
nh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(120*a^4)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
```

```
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx = \frac{1}{5}x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{5}c\int\frac{x^3\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx-\frac{1}{5}(ac)\int\frac{x^4}{\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{x^3\sqrt{c+a^2cx^2}}{20a}+\frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{15a^2}+\frac{1}{5}x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{(2c}{}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{24a^3}-\frac{x^3\sqrt{c+a^2cx^2}}{20a}-\frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{15a^4}+\frac{x^2\sqrt{c+a^2cx^2}\,\tan}{15a^2}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{24a^3}-\frac{x^3\sqrt{c+a^2cx^2}}{20a}-\frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{15a^4}+\frac{x^2\sqrt{c+a^2cx^2}\,\tan}{15a^2}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{24a^3}-\frac{x^3\sqrt{c+a^2cx^2}}{20a}-\frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{15a^4}+\frac{x^2\sqrt{c+a^2cx^2}\,\tan}{15a^2}$$

Mathematica [A] time = 0.13, size = 105, normalized size = 0.66

$$\frac{ax\left(5-6a^2x^2\right)\sqrt{a^2cx^2+c}+11\sqrt{c}\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+acx\right)+8\left(3a^4x^4+a^2x^2-2\right)\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{120a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] (a*x*(5 - 6*a^2*x^2)*Sqrt[c + a^2*c*x^2] + 8*Sqrt[c + a^2*c*x^2]*(-2 + a^2*
x^2 + 3*a^4*x^4)*ArcTan[a*x] + 11*Sqrt[c]*Log[a*c*x + Sqrt[c]*Sqrt[c + a^2*
c*x^2]])/(120*a^4)
```

fricas [A] time = 0.59, size = 94, normalized size = 0.59

$$-\frac{2\left(6\,a^3x^3-5\,ax-8\left(3\,a^4x^4+a^2x^2-2\right)\arctan(ax)\right)\sqrt{a^2cx^2+c}-11\,\sqrt{c}\,\log\left(-2\,a^2cx^2-2\,\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x\right.}{240\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/240*(2*(6*a^3*x^3 - 5*a*x - 8*(3*a^4*x^4 + a^2*x^2 - 2)*arctan(a*x))*sqr
t(a^2*c*x^2 + c) - 11*sqrt(c)*log(-2*a^2*c*x^2 - 2*sqrt(a^2*c*x^2 + c)*a*sq
rt(c)*x - c))/a^4
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 2.72, size = 176, normalized size = 1.10

$$\frac{\sqrt{c\,(ax-i)\,(ax+i)}\,\left(24\arctan(ax)\,x^4a^4-6a^3x^3+8\arctan(ax)\,x^2a^2+5ax-16\arctan(ax)\right)}{120a^4}+\frac{11\sqrt{c\,(ax-i)\,(ax}{120a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/120/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(24*arctan(a*x)*x^4*a^4-6*a^3*x^3+8*arc
tan(a*x)*x^2*a^2+5*a*x-16*arctan(a*x))+11/120/a^4*(c*(a*x-I)*(I+a*x))^(1/2)
*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)+I)/(a^2*x^2+1)^(1/2)-11/120/a^4*(c*(a*x-I)*
(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-I)/(a^2*x^2+1)^(1/2)
```

maxima [A] time = 0.45, size = 127, normalized size = 0.79

$$-\frac{1}{120}\left(a\left(\frac{3\left(\frac{2\left(a^2x^2+1\right)^{\frac{3}{2}}x}{a^2}-\frac{\sqrt{a^2x^2+1}\,x}{a^2}-\frac{\operatorname{arsinh}(ax)}{a^3}\right)}{a^2}-\frac{8\left(\sqrt{a^2x^2+1}\,x+\frac{\operatorname{arsinh}(ax)}{a}\right)}{a^4}\right)-8\left(\frac{3\left(a^2x^2+1\right)^{\frac{3}{2}}x^2}{a^2}-\frac{2\left(a^2x^2+\right.}{a^4}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/120*(a*(3*(2*(a^2*x^2 + 1)^(3/2)*x/a^2 - sqrt(a^2*x^2 + 1)*x/a^2 - arcsi
nh(a*x)/a^3)/a^2 - 8*(sqrt(a^2*x^2 + 1)*x + arcsinh(a*x)/a)/a^4) - 8*(3*(a^
2*x^2 + 1)^(3/2)*x^2/a^2 - 2*(a^2*x^2 + 1)^(3/2)/a^4)*arctan(a*x))*sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^3\,\mathrm{atan}\left(a\,x\right)\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^3*atan(a*x)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^3\sqrt{c\left(a^2x^2+1\right)}\,\operatorname{atan}(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(c*(a**2*x**2 + 1))*atan(a*x), x)
```

3.201 $\int x^2\sqrt{c+a^2cx^2}\ \tan^{-1}(ax)\,dx$

Optimal. Leaf size=298

$$\frac{x\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)}{8a^2}+\frac{1}{4}x^3\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)-\frac{ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{8a^3\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{8a^3\sqrt{a^2cx^2+c}}-\cdots$$

```
[Out] -1/12*(a^2*c*x^2+c)^(3/2)/a^3/c+1/4*I*c*arctan(a*x)*arctan((1+I*a*x)^(1/2)/
(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-1/8*I*c*polylog(
2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(
1/2)+1/8*I*c*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)
/a^3/(a^2*c*x^2+c)^(1/2)+1/8*(a^2*c*x^2+c)^(1/2)/a^3+1/8*x*arctan(a*x)*(a^2
*c*x^2+c)^(1/2)/a^2+1/4*x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 298, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4946, 4952, 261, 4890, 4886, 266, 43}

$$-\frac{ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{8a^3\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{8a^3\sqrt{a^2cx^2+c}}-\frac{\left(a^2cx^2+c\right)^{3/2}}{12a^3c}+\frac{\sqrt{a^2cx^2+c}}{8a^3}+\frac{1}{4}x^3\sqrt{\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] Sqrt[c + a^2*c*x^2]/(8*a^3) - (c + a^2*c*x^2)^(3/2)/(12*a^3*c) + (x*Sqrt[c
+ a^2*c*x^2]*ArcTan[a*x])/(8*a^2) + (x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/4
 + ((I/4)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I
*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) - ((I/8)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, (
(-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + ((I/8)*
c*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*S
qrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
```

```
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx = \frac{1}{4}x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{4}c\int\frac{x^2\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx-\frac{1}{4}(ac)\int\frac{x^3}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{8a^2}+\frac{1}{4}x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{c\int\frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{8a^2}-\frac{c\int\frac{}{\sqrt{c+}}}{8}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{8a^3}+\frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{8a^2}+\frac{1}{4}x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{1}{8}(ac)\,\mathrm{Su}$$

$$= \frac{\sqrt{c+a^2cx^2}}{8a^3}-\frac{\left(c+a^2cx^2\right)^{3/2}}{12a^3c}+\frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{8a^2}+\frac{1}{4}x^3\sqrt{c+a^2cx^2}\,\tan^{-1}($$

Mathematica [A] time = 3.01, size = 278, normalized size = 0.93

$$\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{1}{4}\left(a^2x^2+1\right)^2\left(-\frac{2}{\sqrt{a^2x^2+1}}+3\tan^{-1}(ax)\left(-\frac{14ax}{\sqrt{a^2x^2+1}}+3\log\left(1-ie^{i\tan^{-1}(ax)}\right)-3\log\left(1+ie^{i\tan^{-1}(ax}\right.\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*((-6*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (6*I)*P
olyLog[2, I*E^(I*ArcTan[a*x])] - ((1 + a^2*x^2)^2*(-2/Sqrt[1 + a^2*x^2] - 6
*Cos[3*ArcTan[a*x]] + 3*ArcTan[a*x]*((-14*a*x)/Sqrt[1 + a^2*x^2] + 3*Log[1
- I*E^(I*ArcTan[a*x])] + 4*Cos[2*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])]
 - Log[1 + I*E^(I*ArcTan[a*x])]) + Cos[4*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTa
```

```
n[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) - 3*Log[1 + I*E^(I*ArcTan[a*x])] +
 2*Sin[3*ArcTan[a*x]])))/4))/(48*a^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x^2\arctan\left(ax\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.30, size = 199, normalized size = 0.67

$$\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(6\arctan\left(ax\right)x^3a^3-2a^2x^2+3\arctan\left(ax\right)xa+1\right)}{24a^3}+\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(\arctan\left(ax\right)\ln\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/24/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(6*arctan(a*x)*x^3*a^3-2*a^2*x^2+3*arcta
n(a*x)*x*a+1)+1/8*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)*ln(1+I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1
+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a
^3/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{a^2cx^2+c}\,x^2\arctan\left(ax\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^2*atan(a*x)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(c*(a**2*x**2 + 1))*atan(a*x), x)
```

3.202 $\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx$

Optimal. Leaf size=86

$$-\frac{x\sqrt{a^2cx^2+c}}{6a}+\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}{3a^2c}-\frac{\sqrt{c}\,\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{6a^2}$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/a^2/c-1/6*arctanh(a*x*c^(1/2)/(a^2*c*x^
2+c)^(1/2))*c^(1/2)/a^2-1/6*x*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.06, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4930, 195, 217, 206}

$$-\frac{x\sqrt{a^2cx^2+c}}{6a}+\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}{3a^2c}-\frac{\sqrt{c}\,\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{6a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] -(x*Sqrt[c + a^2*c*x^2])/(6*a) + ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/(3*a^2
*c) - (Sqrt[c]*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(6*a^2)
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\sqrt{c+a^2cx^2}\tan^{-1}(ax)\,dx = \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3a^2c}-\frac{\int\sqrt{c+a^2cx^2}\,dx}{3a}$$
$$=-\frac{x\sqrt{c+a^2cx^2}}{6a}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3a^2c}-\frac{c\int\frac{1}{\sqrt{c+a^2cx^2}}\,dx}{6a}$$
$$=-\frac{x\sqrt{c+a^2cx^2}}{6a}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3a^2c}-\frac{c\,\text{Subst}\left(\int\frac{1}{1-a^2cx^2}\,dx,x,\frac{x}{\sqrt{c+a^2cx^2}}\right)}{6a}$$
$$=-\frac{x\sqrt{c+a^2cx^2}}{6a}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3a^2c}-\frac{\sqrt{c}\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{c+a^2cx^2}}\right)}{6a^2}$$

Mathematica [A] time = 0.11, size = 86, normalized size = 1.00

$$-\frac{ax\sqrt{a^2cx^2+c}+\sqrt{c}\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+acx\right)-2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{6a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] -1/6*(a*x*Sqrt[c + a^2*c*x^2] - 2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[
a*x] + Sqrt[c]*Log[a*c*x + Sqrt[c]*Sqrt[c + a^2*c*x^2]])/a^2
```

fricas [A] time = 0.59, size = 77, normalized size = 0.90

$$-\frac{2\sqrt{a^2cx^2+c}\left(ax-2\left(a^2x^2+1\right)\arctan(ax)\right)-\sqrt{c}\log\left(-2a^2cx^2+2\sqrt{a^2cx^2+c}\,a\sqrt{c}x-c\right)}{12a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/12*(2*sqrt(a^2*c*x^2 + c)*(a*x - 2*(a^2*x^2 + 1)*arctan(a*x)) - sqrt(c)*
log(-2*a^2*c*x^2 + 2*sqrt(a^2*c*x^2 + c)*a*sqrt(c)*x - c))/a^2
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 0.93, size = 156, normalized size = 1.81

$$\frac{\sqrt{c(ax-i)(ax+i)}\left(2\arctan(ax)x^2a^2-ax+2\arctan(ax)\right)}{6a^2}-\frac{\sqrt{c(ax-i)(ax+i)}\ \ln\left(\frac{iax+1}{\sqrt{a^2x^2+1}}+i\right)}{6a^2\sqrt{a^2x^2+1}}+\frac{\sqrt{c(ax-i)(}}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/6/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)*x^2*a^2-a*x+2*arctan(a*x))
-1/6/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)+I)/(a^2*x
^2+1)^(1/2)+1/6/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2
)-I)/(a^2*x^2+1)^(1/2)
```

maxima [B] time = 0.53, size = 260, normalized size = 3.02

$$\frac{4\left(a^2x^2+1\right)^{\frac{3}{2}}\sqrt{c}\arctan\left(ax\right)-2\left(a^4x^4+10\,a^2x^2+9\right)^{\frac{1}{4}}\left(ax\cos\left(\frac{1}{2}\arctan\left(4\,ax,-a^2x^2+3\right)\right)+2\sin\left(\frac{1}{2}\arctan\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/12*(4*(a^2*x^2 + 1)^(3/2)*sqrt(c)*arctan(a*x) - 2*(a^4*x^4 + 10*a^2*x^2 +
 9)^(1/4)*(a*x*cos(1/2*arctan2(4*a*x, -a^2*x^2 + 3)) + 2*sin(1/2*arctan2(4*
a*x, -a^2*x^2 + 3)))*sqrt(c) + sqrt(c)*(arctan2((a^4*x^4 + 10*a^2*x^2 + 9)^
(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) + 2, a*x + (a^4*x^4 + 10*a^2*x^2
 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 - 3))) + arctan2((a^4*x^4 + 10*a
^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) - 2, -a*x + (a^4*x^4
 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 - 3)))))/a^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{atan}\left(a\,x\right)\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x*atan(a*x)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x), x)
```

3.203 $\int \sqrt{c+a^2cx^2}\tan^{-1}(ax)\,dx$

Optimal. Leaf size=244

$$\frac{ic\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}-\frac{ic\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}}{2a}-\frac{ic\sqrt{a^2x^2+1}\,\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)\tan^{-1}(ax)}{a\sqrt{a^2cx^2+c}}+\frac{1}{2}x$$

```
[Out] -I*c*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/
a/(a^2*c*x^2+c)^(1/2)+1/2*I*c*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))
*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-1/2*I*c*polylog(2,I*(1+I*a*x)^(1/2
)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-1/2*(a^2*c*x^2+c
)^(1/2)/a+1/2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {4878, 4890, 4886}

$$\frac{ic\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}-\frac{ic\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}}{2a}-\frac{ic\sqrt{a^2x^2+1}\,\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right.}{a\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] -Sqrt[c + a^2*c*x^2]/(2*a) + (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/2 - (I*c*S
qrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a*Sq
rt[c + a^2*c*x^2]) + ((I/2)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I
*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) - ((I/2)*c*Sqrt[1 + a^2*x^
2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2])
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] && !GtQ[d, 0]
```

Rubi steps

$$\int \sqrt{c+a^2cx^2}\tan^{-1}(ax)\,dx = -\frac{\sqrt{c+a^2cx^2}}{2a} + \frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{2}c\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx$$
$$= -\frac{\sqrt{c+a^2cx^2}}{2a} + \frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{\left(c\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)}{\sqrt{1+a^2x^2}}\,dx}{2\sqrt{c+a^2cx^2}}$$
$$= -\frac{\sqrt{c+a^2cx^2}}{2a} + \frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{ic\sqrt{1+a^2x^2}\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+ia}}{\sqrt{1-ia}}\right.}{a\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.61, size = 141, normalized size = 0.58

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(\sqrt{a^2x^2+1}\left(ax\tan^{-1}(ax)-1\right)+i\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)-i\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+\tan^{-1}(ax)\left(\log\left(1-ie^{i}\right.\right.\right.}{2a\sqrt{a^2x^2+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(Sqrt[1 + a^2*x^2]*(-1 + a*x*ArcTan[a*x]) + ArcTan[a
*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + I*PolyL
og[2, (-I)*E^(I*ArcTan[a*x])] - I*PolyLog[2, I*E^(I*ArcTan[a*x])]))/(2*a*Sq
rt[1 + a^2*x^2])
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\sqrt{a^2cx^2+c}\arctan(ax), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.58, size = 178, normalized size = 0.73

$$\frac{\sqrt{c(ax-i)(ax+i)}\,(\arctan(ax)xa-1)}{2a} - \frac{\sqrt{c(ax-i)(ax+i)}\left(\arctan(ax)\ln\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-\arctan(ax)\ln\left(1\right.\right.}{2a\sqrt{a^2x^2+}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/2/a*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)*x*a-1)-1/2*(c*(a*x-I)*(I+a*x))
^(1/2)*(arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*
```

```
(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dil
og(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^2cx^2 + c} \arctan(ax) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \operatorname{atan}(a\,x)\,\sqrt{c\,a^2\,x^2 + c} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{c\left(a^2x^2 + 1\right)} \operatorname{atan}(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x), x)
```

3.204 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x}\,dx$

Optimal. Leaf size=229

$$\frac{ic\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{ic\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\sqrt{a^2cx^2+c}\tan^{-1}(ax)-\sqrt{c}\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{a^2cx^2+c}}\right)-\frac{2c\sqrt{}}{}$$

```
[Out] -arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))*c^(1/2)-2*c*arctan(a*x)*arctanh((
1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+I*c*p
olylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^
(1/2)-I*c*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)+arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4946, 4958, 4954, 217, 206}

$$\frac{ic\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{ic\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\sqrt{a^2cx^2+c}\tan^{-1}(ax)-\sqrt{c}\tanh^{-1}\left(\frac{}{\sqrt{a}}\right.$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x,x]
```

```
[Out] Sqrt[c + a^2*c*x^2]*ArcTan[a*x] - (2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan
h[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - Sqrt[c]*ArcTanh[(
a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]] + (I*c*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqr
t[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - (I*c*Sqrt[1 + a^2*x^2
]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x}\,dx = \sqrt{c+a^2cx^2}\tan^{-1}(ax) + c\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx - (ac)\int \frac{1}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax) - (ac)\,\text{Subst}\left(\int \frac{1}{1-a^2cx^2}\,dx, x, \frac{x}{\sqrt{c+a^2cx^2}}\right) + \frac{\left(c\sqrt{1+a^2\right.}}{\sqrt{\right.}}$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{2c\sqrt{1+a^2x^2}\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}} - \sqrt{c}\tanh^{-1}\left(\right.$$

Mathematica [A] time = 0.19, size = 164, normalized size = 0.72

$$\frac{\sqrt{a^2cx^2+c}\left(\sqrt{a^2x^2+1}\tan^{-1}(ax) + i\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - i\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right) + \tan^{-1}(ax)\log\left(1-e^{i\tan^{-1}(ax)}\right) - \tan^{-1}(\right.}{\sqrt{a^2\right.}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x,x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(Sqrt[1 + a^2*x^2]*ArcTan[a*x] + ArcTan[a*x]*Log[1 - E
^(I*ArcTan[a*x])] - ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] + Log[Cos[ArcTan
[a*x]/2] - Sin[ArcTan[a*x]/2]] - Log[Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2
]] + I*PolyLog[2, -E^(I*ArcTan[a*x])] - I*PolyLog[2, E^(I*ArcTan[a*x])]))/S
qrt[1 + a^2*x^2]
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\arctan(ax)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.70, size = 151, normalized size = 0.66

$$\sqrt{c\,(ax-i)\,(ax+i)}\ \arctan(ax)+\frac{\sqrt{c\,(ax-i)\,(ax+i)}\ \left(2i\arctan\left(\frac{iax+1}{\sqrt{a^2x^2+1}}\right)+i\,\mathrm{dilog}\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-\arctan(a$$

$$\sqrt{a^2x^2+1}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x,x)
```

```
[Out] (c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)+(c*(a*x-I)*(I+a*x))^(1/2)*(2*I*arctan
((1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan
(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dilog((1+I*a*x)/(a^2*x^2+1)^(1/2)
))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2cx^2+c}\ \arctan(ax)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)\ \sqrt{c\,a^2\,x^2+c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\ \mathrm{atan}(ax)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)*(a**2*c*x**2+c)**(1/2)/x,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)/x, x)
```

3.205 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^2}\,dx$

Optimal. Leaf size=242

$$\frac{iac\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{iac\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac\sqrt{a^2x^2+1}\,\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)\tan^{-1}(ax)}{\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}}{x}$$

```
[Out] -a*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))*c^(1/2)-2*I*a*c*arctan(a*x)*arctan(
(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+I*a*
c*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^
2+c)^(1/2)-I*a*c*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(
1/2)/(a^2*c*x^2+c)^(1/2)-arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x
```

Rubi [A] time = 0.23, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4950, 4944, 266, 63, 208, 4890, 4886}

$$\frac{iac\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{iac\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac\sqrt{a^2x^2+1}\,\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)\tan^{-1}(a}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x^2,x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x) - ((2*I)*a*c*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - a*Sqr
t[c]*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]] + (I*a*c*Sqrt[1 + a^2*x^2]*PolyLo
g[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (I*a*c*
Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c +
 a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
```

```
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^2}\,dx &= c\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx+\left(a^2c\right)\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx\\
&= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x}+(ac)\int \frac{1}{x\sqrt{c+a^2cx^2}}\,dx+\frac{\left(a^2c\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)}{\sqrt{1+a^2x^2}}}{\sqrt{c+a^2cx^2}}\\
&= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x}-\frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}}+\frac{iac\sqrt{1+}}{}\\
&= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x}-\frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}}+\frac{iac\sqrt{1+}}{}\\
&= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x}-\frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}}-a\sqrt{c}\,\tanh
\end{aligned}$$

Mathematica [A] time = 0.46, size = 163, normalized size = 0.67

$$-\frac{a\sqrt{c\left(a^2x^2+1\right)}\left(\frac{\sqrt{a^2x^2+1}\,\tan^{-1}(ax)}{ax}-i\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+i\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+\tan^{-1}(ax)\left(-\log\left(1-ie^{i\tan^{-1}(ax)}\right)\right)\right.}{\sqrt{a^2x^2+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x^2,x]
```

[Out] -((a*Sqrt[c*(1 + a^2*x^2)]*((Sqrt[1 + a^2*x^2]*ArcTan[a*x])/(a*x) - ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] + ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] + Log[Cos[ArcTan[a*x]/2]] - Log[Sin[ArcTan[a*x]/2]] - I*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + I*PolyLog[2, I*E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2])

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/x^2, x)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 0.75, size = 221, normalized size = 0.91

$$-\frac{\sqrt{c(ax-i)(ax+i)}\,\arctan(ax)}{x}+\frac{ia\sqrt{c(ax-i)(ax+i)}\,\left(i\arctan(ax)\ln\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-i\arctan(ax)\ln\left(1-\frac{i(i}{\sqrt{a}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^2,x)

[Out] -(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)/x+I*a*(c*(a*x-I)*(I+a*x))^(1/2)*(I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2cx^2+c}\,\arctan(ax)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="maxima")

[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)/x^2, x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)\,\sqrt{c\,a^2\,x^2+c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x^2,x)

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\,\operatorname{atan}\left(ax\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)*(a**2*c*x**2+c)**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)/x**2, x)
```

3.206 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^3}\,dx$

Optimal. Leaf size=240

$$\frac{ia^2c\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{ia^2c\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{a\sqrt{a^2cx^2+c}}{2x}-\frac{\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{2x^2}-\frac{a^2c\sqrt{a^2x^2+1}}{}$$

```
[Out] -a^2*c*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/
2)/(a^2*c*x^2+c)^(1/2)+1/2*I*a^2*c*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/
2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/2*I*a^2*c*polylog(2,(1+I*a*x)^(
1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/2*a*(a^2*c*x^
2+c)^(1/2)/x-1/2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 0.35, antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4946, 4962, 264, 4958, 4954}

$$\frac{ia^2c\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{ia^2c\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{a\sqrt{a^2cx^2+c}}{2x}-\frac{\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x^3,x]
```

```
[Out] -(a*Sqrt[c + a^2*c*x^2])/(2*x) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(2*x^2)
- (a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a
*x]])/Sqrt[c + a^2*c*x^2] + ((I/2)*a^2*c*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqr
t[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - ((I/2)*a^2*c*Sqrt[1 +
 a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
```

```
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^3}\,dx &= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^2} - c\int \frac{\tan^{-1}(ax)}{x^3\sqrt{c+a^2cx^2}}\,dx + (ac)\int \frac{1}{x^2\sqrt{c+a^2cx^2}}\,dx \\
&= -\frac{a\sqrt{c+a^2cx^2}}{x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{2x^2} - \frac{1}{2}(ac)\int \frac{1}{x^2\sqrt{c+a^2cx^2}}\,dx + \frac{1}{2}\left(a^2c\right) \\
&= -\frac{a\sqrt{c+a^2cx^2}}{2x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{2x^2} + \frac{\left(a^2c\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)}{x\sqrt{1+a^2x^2}}\,dx}{2\sqrt{c+a^2cx^2}} \\
&= -\frac{a\sqrt{c+a^2cx^2}}{2x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1-}}{\sqrt{1-}}\right.}{\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [A] time = 1.12, size = 165, normalized size = 0.69

$$\frac{a^2\sqrt{c\left(a^2x^2+1\right)}\left(4i\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-4i\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)-2\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)+4\tan^{-1}(ax)\log\left(1-e^{i\tan^{-1}(ax)}\right.}{8}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x^3,x]
```

```
[Out] (a^2*Sqrt[c*(1 + a^2*x^2)]*(-2*Cot[ArcTan[a*x]/2] - ArcTan[a*x]*Csc[ArcTan[
a*x]/2]^2 + 4*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] - 4*ArcTan[a*x]*Log[1
+ E^(I*ArcTan[a*x])] + (4*I)*PolyLog[2, -E^(I*ArcTan[a*x])] - (4*I)*PolyLog
[2, E^(I*ArcTan[a*x])] + ArcTan[a*x]*Sec[ArcTan[a*x]/2]^2 - 2*Tan[ArcTan[a*
x]/2]))/(8*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.06, size = 169, normalized size = 0.70

$$-\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\;\left(ax+\arctan\left(ax\right)\right)}{2x^{2}}+\frac{i a^{2}\sqrt{c\left(ax-i\right)\left(ax+i\right)}\;\left(i\arctan\left(ax\right)\ln\left(1+\frac{iax+1}{\sqrt{a^{2}x^{2}+1}}\right)-i\arctan\left(ax\right)\ln}{2\sqrt{a^{2}x^{2}+}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^3,x)
```

```
[Out] -1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(a*x+arctan(a*x))/x^2+1/2*I*a^2*(c*(a*x-I)*(
I+a*x))^(1/2)*(I*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x
)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))
-polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2}cx^{2}+c}\,\arctan\left(ax\right)}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)\,\sqrt{c\,a^{2}\,x^{2}+c}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x^3,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^{2}x^{2}+1\right)}\,\mathrm{atan}\left(ax\right)}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)*(a**2*c*x**2+c)**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)/x**3, x)
```

3.207 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^4}\,dx$

Optimal. Leaf size=84

$$-\frac{a\sqrt{a^2cx^2+c}}{6x^2}-\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}{3cx^3}-\frac{1}{6}a^3\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)$$

```
[Out] -1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/c/x^3-1/6*a^3*arctanh((a^2*c*x^2+c)^(1
/2)/c^(1/2))*c^(1/2)-1/6*a*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 0.10, antiderivative size = 84, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4944, 266, 47, 63, 208}

$$-\frac{a\sqrt{a^2cx^2+c}}{6x^2}-\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}{3cx^3}-\frac{1}{6}a^3\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x^4,x]
```

```
[Out] -(a*Sqrt[c + a^2*c*x^2])/(6*x^2) - ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/(3*c
*x^3) - (a^3*Sqrt[c]*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]])/6
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
```

```
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^4}\,dx = -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3cx^3}+\frac{1}{3}a\int \frac{\sqrt{c+a^2cx^2}}{x^3}\,dx$$
$$= -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3cx^3}+\frac{1}{6}a\,\text{Subst}\left(\int \frac{\sqrt{c+a^2cx}}{x^2}\,dx,x,x^2\right)$$
$$= -\frac{a\sqrt{c+a^2cx^2}}{6x^2}-\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3cx^3}+\frac{1}{12}\left(a^3c\right)\text{Subst}\left(\int \frac{1}{x\sqrt{c+a^2cx}}\,dx,x,$$
$$= -\frac{a\sqrt{c+a^2cx^2}}{6x^2}-\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3cx^3}+\frac{1}{6}a\,\text{Subst}\left(\int \frac{1}{-\frac{1}{a^2}+\frac{x^2}{a^2c}}\,dx,x,\sqrt{c+a^2$$
$$= -\frac{a\sqrt{c+a^2cx^2}}{6x^2}-\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3cx^3}-\frac{1}{6}a^3\sqrt{c}\tanh^{-1}\left(\frac{\sqrt{c+a^2cx^2}}{\sqrt{c}}\right)$$

Mathematica [A] time = 0.12, size = 105, normalized size = 1.25

$$\frac{a^3\sqrt{c}\,x^3\log(x)-ax\left(\sqrt{a^2cx^2+c}+a^2\sqrt{c}\,x^2\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+c\right)\right)-2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{6x^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x^4,x]
```

```
[Out] (-2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] + a^3*Sqrt[c]*x^3*Log[x]
- a*x*(Sqrt[c + a^2*c*x^2] + a^2*Sqrt[c]*x^2*Log[c + Sqrt[c]*Sqrt[c + a^2*c
*x^2]]))/(6*x^3)
```

fricas [A] time = 0.79, size = 84, normalized size = 1.00

$$\frac{a^3\sqrt{c}\,x^3\log\left(-\frac{a^2cx^2-2\sqrt{a^2cx^2+c}\sqrt{c}+2c}{x^2}\right)-2\sqrt{a^2cx^2+c}\left(ax+2\left(a^2x^2+1\right)\arctan(ax)\right)}{12\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="fricas")
```

```
[Out] 1/12*(a^3*sqrt(c)*x^3*log(-(a^2*c*x^2 - 2*sqrt(a^2*c*x^2 + c)*sqrt(c) + 2*c
)/x^2) - 2*sqrt(a^2*c*x^2 + c)*(a*x + 2*(a^2*x^2 + 1)*arctan(a*x)))/x^3
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 1.22, size = 153, normalized size = 1.82

$$-\frac{\sqrt{c\,(ax-i)\,(ax+i)}\,\left(2\arctan\left(ax\right)x^{2}a^{2}+ax+2\arctan\left(ax\right)\right)}{6x^{3}}+\frac{a^{3}\sqrt{c\,(ax-i)\,(ax+i)}\,\ln\left(\frac{iax+1}{\sqrt{a^{2}x^{2}+1}}-1\right)}{6\sqrt{a^{2}x^{2}+1}}-\frac{a^{3}\sqrt{c}\cdots}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^4,x)
```

```
[Out] -1/6*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)*x^2*a^2+a*x+2*arctan(a*x))/x^
3+1/6*a^3*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)/(a^2*
x^2+1)^(1/2)-1/6*a^3*(c*(a*x-I)*(I+a*x))^(1/2)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(
1/2))/(a^2*x^2+1)^(1/2)
```

maxima [A] time = 0.46, size = 73, normalized size = 0.87

$$-\frac{1}{6}\left(\left(a^{2}\operatorname{arsinh}\left(\frac{1}{a|x|}\right)-\sqrt{a^{2}x^{2}+1}\,a^{2}+\frac{\left(a^{2}x^{2}+1\right)^{\frac{3}{2}}}{x^{2}}\right)a+\frac{2\left(a^{2}x^{2}+1\right)^{\frac{3}{2}}\arctan\left(ax\right)}{x^{3}}\right)\sqrt{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="maxima")
```

```
[Out] -1/6*((a^2*arcsinh(1/(a*abs(x))) - sqrt(a^2*x^2 + 1)*a^2 + (a^2*x^2 + 1)^(3
/2)/x^2)*a + 2*(a^2*x^2 + 1)^(3/2)*arctan(a*x)/x^3)*sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}\left(a\,x\right)\,\sqrt{c\,a^{2}\,x^{2}+c}}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x^4,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(1/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^{2}x^{2}+1\right)}\operatorname{atan}\left(ax\right)}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)*(a**2*c*x**2+c)**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)/x**4, x)
```

3.208 $\int x^3 \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)\,dx$

Optimal. Leaf size=217

$$\frac{cx^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{35a^2}+\frac{1}{7}a^2cx^6\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)-\frac{1}{42}acx^5\sqrt{a^2cx^2+c}+\frac{8}{35}cx^4\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)-\frac{23cx}{}$$

```
[Out] 17/560*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^4+3/112*c*x*(a^2*
c*x^2+c)^(1/2)/a^3-23/840*c*x^3*(a^2*c*x^2+c)^(1/2)/a-1/42*a*c*x^5*(a^2*c*x
^2+c)^(1/2)-2/35*c*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^4+1/35*c*x^2*arctan(a*
x)*(a^2*c*x^2+c)^(1/2)/a^2+8/35*c*x^4*arctan(a*x)*(a^2*c*x^2+c)^(1/2)+1/7*a
^2*c*x^6*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.76, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4950, 4946, 4952, 321, 217, 206, 4930}

$$\frac{17c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{a^2cx^2+c}}\right)}{560a^4}-\frac{1}{42}acx^5\sqrt{a^2cx^2+c}-\frac{23cx^3\sqrt{a^2cx^2+c}}{840a}+\frac{3cx\sqrt{a^2cx^2+c}}{112a^3}+\frac{1}{7}a^2cx^6\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

```
[Out] (3*c*x*Sqrt[c + a^2*c*x^2])/(112*a^3) - (23*c*x^3*Sqrt[c + a^2*c*x^2])/(840
*a) - (a*c*x^5*Sqrt[c + a^2*c*x^2])/42 - (2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*
x])/(35*a^4) + (c*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(35*a^2) + (8*c*x^4*
Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/35 + (a^2*c*x^6*Sqrt[c + a^2*c*x^2]*ArcTan
[a*x])/7 + (17*c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(560*a^4
)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\begin{aligned}\int x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx &= c\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx+\left(a^2c\right)\int x^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx\\
&= \frac{1}{5}cx^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{7}a^2cx^6\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{5}c^2\int\frac{x^3\tan}{\sqrt{c+}}\\
&= -\frac{cx^3\sqrt{c+a^2cx^2}}{20a}-\frac{1}{42}acx^5\sqrt{c+a^2cx^2}+\frac{cx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{15a^2}+\frac{8}{35}cx\\
&= \frac{cx\sqrt{c+a^2cx^2}}{24a^3}-\frac{23cx^3\sqrt{c+a^2cx^2}}{840a}-\frac{1}{42}acx^5\sqrt{c+a^2cx^2}-\frac{2c\sqrt{c+a^2cx^2}\,t}{15a^4}\\
&= \frac{3cx\sqrt{c+a^2cx^2}}{112a^3}-\frac{23cx^3\sqrt{c+a^2cx^2}}{840a}-\frac{1}{42}acx^5\sqrt{c+a^2cx^2}-\frac{2c\sqrt{c+a^2cx^2}}{35a^4}\\
&= \frac{3cx\sqrt{c+a^2cx^2}}{112a^3}-\frac{23cx^3\sqrt{c+a^2cx^2}}{840a}-\frac{1}{42}acx^5\sqrt{c+a^2cx^2}-\frac{2c\sqrt{c+a^2cx^2}}{35a^4}\\
&= \frac{3cx\sqrt{c+a^2cx^2}}{112a^3}-\frac{23cx^3\sqrt{c+a^2cx^2}}{840a}-\frac{1}{42}acx^5\sqrt{c+a^2cx^2}-\frac{2c\sqrt{c+a^2cx^2}}{35a^4}\end{aligned}$$

Mathematica [A] time = 0.17, size = 119, normalized size = 0.55

$$\frac{51c^{3/2}\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+acx\right)+48c\left(5a^2x^2-2\right)\left(a^2x^2+1\right)^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)+acx\left(-40a^4x^4-46a^2x\right.}{1680a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

[Out] (a*c*x*Sqrt[c + a^2*c*x^2]*(45 - 46*a^2*x^2 - 40*a^4*x^4) + 48*c*(1 + a^2*x
^2)^2*(-2 + 5*a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] + 51*c^(3/2)*Log[a*c
*x + Sqrt[c]*Sqrt[c + a^2*c*x^2]])/(1680*a^4)

fricas [A] time = 0.75, size = 118, normalized size = 0.54

$$\frac{51\,c^{\frac{3}{2}}\log\left(-2\,a^{2}cx^{2}-2\,\sqrt{a^{2}cx^{2}+c}\,a\sqrt{c}\,x-c\right)-2\left(40\,a^{5}cx^{5}+46\,a^{3}cx^{3}-45\,acx-48\left(5\,a^{6}cx^{6}+8\,a^{4}cx^{4}+a^{2}cx^{2}-\right.\right.}{3360\,a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="fricas")

[Out] 1/3360*(51*c^(3/2)*log(-2*a^2*c*x^2 - 2*sqrt(a^2*c*x^2 + c)*a*sqrt(c)*x - c
) - 2*(40*a^5*c*x^5 + 46*a^3*c*x^3 - 45*a*c*x - 48*(5*a^6*c*x^6 + 8*a^4*c*x
^4 + a^2*c*x^2 - 2*c)*arctan(a*x))*sqrt(a^2*c*x^2 + c))/a^4

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value

maple [C] time = 2.56, size = 199, normalized size = 0.92

$$\frac{c\sqrt{c\,(ax-i)\,(ax+i)}\;\left(240\arctan(ax)\,x^{6}a^{6}-40x^{5}a^{5}+384\arctan(ax)\,x^{4}a^{4}-46a^{3}x^{3}+48\arctan(ax)\,x^{2}a^{2}+45a\right.}{1680a^{4}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x)

[Out] 1/1680*c/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(240*arctan(a*x)*x^6*a^6-40*x^5*a^5+
384*arctan(a*x)*x^4*a^4-46*a^3*x^3+48*arctan(a*x)*x^2*a^2+45*a*x-96*arctan(
a*x))+17/560*c/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)
+I)/(a^2*x^2+1)^(1/2)-17/560*c/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(
a^2*x^2+1)^(1/2)-I)/(a^2*x^2+1)^(1/2)

maxima [A] time = 0.52, size = 214, normalized size = 0.99

$$-\frac{1}{1680}\left(\left(\left(5\left(\frac{8\left(a^{2}x^{2}+1\right)^{\frac{3}{2}}x^{3}}{a^{2}}-\frac{6\left(a^{2}x^{2}+1\right)^{\frac{3}{2}}x}{a^{4}}+\frac{3\sqrt{a^{2}x^{2}+1}\,x}{a^{4}}+\frac{3\,\mathrm{arsinh}(ax)}{a^{5}}\right)c+\frac{18\,c\left(\frac{2\left(a^{2}x^{2}+1\right)^{\frac{3}{2}}x}{a^{2}}-\frac{\sqrt{a^{2}x^{2}+1}\,x}{a^{2}}-\right.}{a^{2}}\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="maxima")

[Out] -1/1680*((5*(8*(a^2*x^2 + 1)^(3/2)*x^3/a^2 - 6*(a^2*x^2 + 1)^(3/2)*x/a^4 +
3*sqrt(a^2*x^2 + 1)*x/a^4 + 3*arcsinh(a*x)/a^5)*c + 18*c*(2*(a^2*x^2 + 1)^(
3/2)*x/a^2 - sqrt(a^2*x^2 + 1)*x/a^2 - arcsinh(a*x)/a^3)/a^2 - 48*(sqrt(a^2
*x^2 + 1)*x + arcsinh(a*x)/a)*c/a^4)*a - 48*(5*(a^2*x^2 + 1)^(3/2)*c*x^4 +

```
3*(a^2*x^2 + 1)^(3/2)*c*x^2/a^2 - 2*(a^2*x^2 + 1)^(3/2)*c/a^4)*arctan(a*x))
*sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 \operatorname{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^3*atan(a*x)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3}\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}{\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**(3/2)*atan(a*x),x)
```

```
[Out] Integral(x**3*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x), x)
```

3.209 $\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)\, dx$

Optimal. Leaf size=357

$$\frac{cx\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{16a^2}+\frac{1}{6}a^2cx^5\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)+\frac{7}{24}cx^3\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)-\frac{ic^2\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right.}{16a^3\sqrt{a^2cx^2+c}}$$

```
[Out] 1/72*(a^2*c*x^2+c)^(3/2)/a^3-1/30*(a^2*c*x^2+c)^(5/2)/a^3/c+1/8*I*c^2*arcta
n(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c
*x^2+c)^(1/2)-1/16*I*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2
*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/16*I*c^2*polylog(2,I*(1+I*a*x)^(1/2
)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/16*c*(a^2*c*
x^2+c)^(1/2)/a^3+1/16*c*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2+7/24*c*x^3*ar
ctan(a*x)*(a^2*c*x^2+c)^(1/2)+1/6*a^2*c*x^5*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.78, antiderivative size = 357, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4950, 4946, 4952, 261, 4890, 4886, 266, 43}

$$-\frac{ic^2\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{16a^3\sqrt{a^2cx^2+c}}+\frac{ic^2\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{16a^3\sqrt{a^2cx^2+c}}+\frac{ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+ia}}{\sqrt{1-ia}}\right.}{8a^3\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2])/(16*a^3) + (c + a^2*c*x^2)^(3/2)/(72*a^3) - (c + a^
2*c*x^2)^(5/2)/(30*a^3*c) + (c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(16*a^2)
+ (7*c*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/24 + (a^2*c*x^5*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x])/6 + ((I/8)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[
1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) - ((I/16)*c^2*Sqrt[1
 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c
 + a^2*c*x^2]) + ((I/16)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x
])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
```

```
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^2 \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)\,dx = c\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx + \left(a^2c\right)\int x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx$$

$$= \frac{1}{4}cx^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{6}a^2cx^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{4}c^2\int \frac{x^2\tan^{-1}(}{\sqrt{c+a^2c}}$$

$$= \frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{8a^2} + \frac{7}{24}cx^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{6}a^2cx^5\sqrt{c+a^2cx^2}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{8a^3} + \frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{16a^2} + \frac{7}{24}cx^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{6}$$

$$= \frac{c\sqrt{c+a^2cx^2}}{48a^3} + \frac{\left(c+a^2cx^2\right)^{3/2}}{36a^3} - \frac{\left(c+a^2cx^2\right)^{5/2}}{30a^3c} + \frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{16a^2} +$$

$$= \frac{c\sqrt{c+a^2cx^2}}{16a^3} + \frac{\left(c+a^2cx^2\right)^{3/2}}{72a^3} - \frac{\left(c+a^2cx^2\right)^{5/2}}{30a^3c} + \frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{16a^2} +$$

Mathematica [A] time = 6.34, size = 576, normalized size = 1.61

$$c\sqrt{a^2cx^2+c}\left(\frac{3}{4}\left(a^2x^2+1\right)^{5/2} + \frac{55}{8}\left(a^2x^2+1\right)^3\cos\left(3\tan^{-1}(ax)\right) - \frac{45}{8}\left(a^2x^2+1\right)^3\cos\left(5\tan^{-1}(ax)\right) + \frac{15}{16}\left(a^2x^2+1\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*((3*(1 + a^2*x^2)^(5/2))/4 + (55*(1 + a^2*x^2)^3*Cos
[3*ArcTan[a*x]])/8 - (45*(1 + a^2*x^2)^3*Cos[5*ArcTan[a*x]])/8 - (90*I)*Pol
yLog[2, (-I)*E^(I*ArcTan[a*x])] + (90*I)*PolyLog[2, I*E^(I*ArcTan[a*x])] -
(15*(1 + a^2*x^2)^2*(-2/Sqrt[1 + a^2*x^2] - 6*Cos[3*ArcTan[a*x]] + 3*ArcTan
[a*x]*((-14*a*x)/Sqrt[1 + a^2*x^2] + 3*Log[1 - I*E^(I*ArcTan[a*x])] + 4*Cos
[2*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])
]) + Cos[4*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcT
an[a*x])]) - 3*Log[1 + I*E^(I*ArcTan[a*x])] + 2*Sin[3*ArcTan[a*x]])))/2 + (
15*(1 + a^2*x^2)^3*ArcTan[a*x]*((156*a*x)/Sqrt[1 + a^2*x^2] + 30*Log[1 - I*
E^(I*ArcTan[a*x])] + 3*Cos[6*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + 45
*Cos[2*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a
*x])]) + 18*Cos[4*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^
(I*ArcTan[a*x])]) - 30*Log[1 + I*E^(I*ArcTan[a*x])] - 3*Cos[6*ArcTan[a*x]]*
Log[1 + I*E^(I*ArcTan[a*x])] - 94*Sin[3*ArcTan[a*x]] + 6*Sin[5*ArcTan[a*x]]
))/16))/(1440*a^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^4+cx^2\right)\sqrt{a^2cx^2+c}\,\arctan(ax), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^4 + c*x^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.32, size = 221, normalized size = 0.62

$$\frac{c\sqrt{c\,(ax-i)\,(ax+i)}\,\left(120\arctan\,(ax)\,x^5a^5-24a^4x^4+210\arctan\,(ax)\,x^3a^3-38a^2x^2+45\arctan\,(ax)\,xa+31\right.}{720a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x)

[Out] 1/720*c/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(120*arctan(a*x)*x^5*a^5-24*a^4*x^4+210*arctan(a*x)*x^3*a^3-38*a^2*x^2+45*arctan(a*x)*x*a+31)+1/16*c*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^3/(a^2*x^2+1)^(1/2)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a^2cx^2+c\right)^{\frac{3}{2}}x^2\arctan\,(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^2*arctan(a*x), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2*atan(a*x)*(c + a^2*c*x^2)^(3/2),x)

[Out] int(x^2*atan(a*x)*(c + a^2*c*x^2)^(3/2), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\,\mathrm{atan}\,(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**2*(a**2*c*x**2+c)**(3/2)*atan(a*x),x)

[Out] Integral(x**2*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x), x)

3.210 $\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx$

Optimal. Leaf size=109

$$-\frac{3c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{40a^2}-\frac{x\left(a^2cx^2+c\right)^{3/2}}{20a}-\frac{3cx\sqrt{a^2cx^2+c}}{40a}+\frac{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)}{5a^2c}$$

```
[Out] -1/20*x*(a^2*c*x^2+c)^(3/2)/a+1/5*(a^2*c*x^2+c)^(5/2)*arctan(a*x)/a^2/c-3/4
0*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^2-3/40*c*x*(a^2*c*x^2+
c)^(1/2)/a
```

Rubi [A] time = 0.07, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4930, 195, 217, 206}

$$-\frac{3c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{40a^2}-\frac{x\left(a^2cx^2+c\right)^{3/2}}{20a}-\frac{3cx\sqrt{a^2cx^2+c}}{40a}+\frac{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)}{5a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

```
[Out] (-3*c*x*Sqrt[c + a^2*c*x^2])/(40*a) - (x*(c + a^2*c*x^2)^(3/2))/(20*a) + ((
c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/(5*a^2*c) - (3*c^(3/2)*ArcTanh[(a*Sqrt[c]
*x)/Sqrt[c + a^2*c*x^2]])/(40*a^2)
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx=\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{5a^2c}-\frac{\int\left(c+a^2cx^2\right)^{3/2}dx}{5a}$$
$$=-\frac{x\left(c+a^2cx^2\right)^{3/2}}{20a}+\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{5a^2c}-\frac{(3c)\int\sqrt{c+a^2cx^2}\,dx}{20a}$$
$$=-\frac{3cx\sqrt{c+a^2cx^2}}{40a}-\frac{x\left(c+a^2cx^2\right)^{3/2}}{20a}+\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{5a^2c}-\frac{\left(3c^2\right)\int\ldots}{40\ldots}$$
$$=-\frac{3cx\sqrt{c+a^2cx^2}}{40a}-\frac{x\left(c+a^2cx^2\right)^{3/2}}{20a}+\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{5a^2c}-\frac{\left(3c^2\right)\text{Sub}\ldots}{\ldots}$$
$$=-\frac{3cx\sqrt{c+a^2cx^2}}{40a}-\frac{x\left(c+a^2cx^2\right)^{3/2}}{20a}+\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{5a^2c}-\frac{3c^{3/2}\tanh\ldots}{4\ldots}$$

Mathematica [A] time = 0.18, size = 101, normalized size = 0.93

$$-\frac{3c^{3/2}\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+acx\right)+acx\left(2a^2x^2+5\right)\sqrt{a^2cx^2+c}-8c\left(a^2x^2+1\right)^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{40a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

```
[Out] -1/40*(a*c*x*(5 + 2*a^2*x^2)*Sqrt[c + a^2*c*x^2] - 8*c*(1 + a^2*x^2)^2*Sqrt
[c + a^2*c*x^2]*ArcTan[a*x] + 3*c^(3/2)*Log[a*c*x + Sqrt[c]*Sqrt[c + a^2*c*
x^2]])/a^2
```

fricas [A] time = 0.72, size = 98, normalized size = 0.90

$$\frac{3\,c^{\frac{3}{2}}\log\left(-2\,a^2cx^2+2\,\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x-c\right)-2\left(2\,a^3cx^3+5\,acx-8\left(a^4cx^4+2\,a^2cx^2+c\right)\arctan(ax)\right)\sqrt{a^2cx\ldots}}{80\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] 1/80*(3*c^(3/2)*log(-2*a^2*c*x^2 + 2*sqrt(a^2*c*x^2 + c)*a*sqrt(c)*x - c) -
 2*(2*a^3*c*x^3 + 5*a*c*x - 8*(a^4*c*x^4 + 2*a^2*c*x^2 + c)*arctan(a*x))*sq
rt(a^2*c*x^2 + c))/a^2
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 0.89, size = 179, normalized size = 1.64

$$\frac{c\sqrt{c\,(ax-i)\,(ax+i)}\,\left(8\arctan(ax)\,x^4a^4-2a^3x^3+16\arctan(ax)\,x^2a^2-5ax+8\arctan(ax)\right)}{40a^2}+\frac{3c\sqrt{c\,(ax-i)\,(\ldots}}{40\ldots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x)
```

```
[Out] 1/40*c/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(8*arctan(a*x)*x^4*a^4-2*a^3*x^3+16*ar
ctan(a*x)*x^2*a^2-5*a*x+8*arctan(a*x))+3/40*c/a^2*(c*(a*x-I)*(I+a*x))^(1/2)
*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-I)/(a^2*x^2+1)^(1/2)-3/40*c/a^2*(c*(a*x-I)*
(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)+I)/(a^2*x^2+1)^(1/2)
```

maxima [B] time = 0.60, size = 406, normalized size = 3.72

$$40\left(a^2cx^2+c\right)\sqrt{a^2x^2+1}\,\sqrt{c}\,\arctan\left(ax\right)-20\left(a^4x^4+10\,a^2x^2+9\right)^{\frac{1}{4}}\left(acx\cos\left(\frac{1}{2}\,\arctan\left(4\,ax,-a^2x^2+3\right)\right)+2\,c\,\mathrm{si}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] 1/120*(40*(a^2*c*x^2 + c)*sqrt(a^2*x^2 + 1)*sqrt(c)*arctan(a*x) - 20*(a^4*x
^4 + 10*a^2*x^2 + 9)^(1/4)*(a*c*x*cos(1/2*arctan2(4*a*x, -a^2*x^2 + 3)) + 2
*c*sin(1/2*arctan2(4*a*x, -a^2*x^2 + 3)))*sqrt(c) - ((a*(3*(2*(a^2*x^2 + 1)
^(3/2)*x/a^2 - sqrt(a^2*x^2 + 1)*x/a^2 - arcsinh(a*x)/a^3)/a^2 - 8*(sqrt(a^
2*x^2 + 1)*x + arcsinh(a*x)/a)/a^4) - 8*(3*(a^2*x^2 + 1)^(3/2)*x^2/a^2 - 2*
(a^2*x^2 + 1)^(3/2)/a^4)*arctan(a*x))*a^4*c - 10*c*arctan2((a^4*x^4 + 10*a^
2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) + 2, a*x + (a^4*x^4 +
 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 - 3))) - 10*c*arctan2
((a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) - 2,
 -a*x + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 - 3
))))*sqrt(c))/a^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x*atan(a*x)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)*atan(a*x),x)
```

```
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x), x)
```

3.211 $\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)\,dx$

Optimal. Leaf size=298

$$\frac{3ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{4a\sqrt{a^2cx^2+c}}-\frac{3c\sqrt{a^2\cdots}}{8\cdots}$$

```
[Out] -1/12*(a^2*c*x^2+c)^(3/2)/a+1/4*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)-3/4*I*c^2
*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a
^2*c*x^2+c)^(1/2)+3/8*I*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(
a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3/8*I*c^2*polylog(2,I*(1+I*a*x)^(1/2
)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3/8*c*(a^2*c*x^2
+c)^(1/2)/a+3/8*c*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 298, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4878, 4890, 4886}

$$\frac{3ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\cdots\right.}{4a\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

```
[Out] (-3*c*Sqrt[c + a^2*c*x^2])/(8*a) - (c + a^2*c*x^2)^(3/2)/(12*a) + (3*c*x*Sq
rt[c + a^2*c*x^2]*ArcTan[a*x])/8 + (x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/4
- (((3*I)/4)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[
1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) + (((3*I)/8)*c^2*Sqrt[1 + a^2*x^2]*Pol
yLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) -
(((3*I)/8)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*
a*x]])/(a*Sqrt[c + a^2*c*x^2])
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)\,dx = -\frac{\left(c+a^2cx^2\right)^{3/2}}{12a} + \frac{1}{4}x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax) + \frac{1}{4}(3c)\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,d$$

$$= -\frac{3c\sqrt{c+a^2cx^2}}{8a} - \frac{\left(c+a^2cx^2\right)^{3/2}}{12a} + \frac{3}{8}cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{4}x\left(c+a^2cx^2\right)^{3/}$$

$$= -\frac{3c\sqrt{c+a^2cx^2}}{8a} - \frac{\left(c+a^2cx^2\right)^{3/2}}{12a} + \frac{3}{8}cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{4}x\left(c+a^2cx^2\right)^{3/}$$

$$= -\frac{3c\sqrt{c+a^2cx^2}}{8a} - \frac{\left(c+a^2cx^2\right)^{3/2}}{12a} + \frac{3}{8}cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{4}x\left(c+a^2cx^2\right)^{3/}$$

Mathematica [A] time = 2.73, size = 351, normalized size = 1.18

$$\frac{c\sqrt{a^2cx^2+c}\left(2\left(a^2x^2+1\right)^{3/2} + 96\sqrt{a^2x^2+1}\left(ax\tan^{-1}(ax)-1\right) + 6\left(a^2x^2+1\right)^2\cos\left(3\tan^{-1}(ax)\right) - 3\left(a^2x^2+1\right)^2}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(2*(1 + a^2*x^2)^(3/2) + 96*Sqrt[1 + a^2*x^2]*(-1 +
a*x*ArcTan[a*x]) + 6*(1 + a^2*x^2)^2*Cos[3*ArcTan[a*x]] + 96*ArcTan[a*x]*(L
og[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + (72*I)*PolyLo
g[2, (-I)*E^(I*ArcTan[a*x])] - (72*I)*PolyLog[2, I*E^(I*ArcTan[a*x])] - 3*(
1 + a^2*x^2)^2*ArcTan[a*x]*((-14*a*x)/Sqrt[1 + a^2*x^2] + 3*Log[1 - I*E^(I*
ArcTan[a*x])] + 4*Cos[2*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1
+ I*E^(I*ArcTan[a*x])]) + Cos[4*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])]
- Log[1 + I*E^(I*ArcTan[a*x])]) - 3*Log[1 + I*E^(I*ArcTan[a*x])] + 2*Sin[3*
ArcTan[a*x]])))/(192*a*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.56, size = 201, normalized size = 0.67

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\left(6\arctan\left(ax\right)x^3a^3-2a^2x^2+15\arctan\left(ax\right)xa-11\right)}{24a} - \frac{3c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\left(\arctan\left(ax\right)\ln\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x),x)
```

```
[Out] 1/24*c/a*(c*(a*x-I)*(I+a*x))^(1/2)*(6*arctan(a*x)*x^3*a^3-2*a^2*x^2+15*arct
an(a*x)*x*a-11)-3/8*c*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)*ln(1+I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dil
og(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)
))/a/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2+c\right)^{\frac{3}{2}} \arctan\left(ax\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}} \operatorname{atan}{\left(ax \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x),x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x), x)
```

3.212 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x}\,dx$

Optimal. Leaf size=281

$$-\frac{7}{6}c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)+\frac{ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2c^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)}{\sqrt{a^2cx^2+}}$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)-7/6*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*
x^2+c)^(1/2))-2*c^2*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a
^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+I*c^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a
*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-I*c^2*polylog(2,(1+I*a*x)^
(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/6*a*c*x*(a^2
*c*x^2+c)^(1/2)+c*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.38, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4950, 4946, 4958, 4954, 217, 206, 4930, 195}

$$\frac{ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{7}{6}c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)-\frac{2c^2\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x,x]
```

```
[Out] -(a*c*x*Sqrt[c + a^2*c*x^2])/6 + c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] + ((c +
a^2*c*x^2)^(3/2)*ArcTan[a*x])/3 - (2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcT
anh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (7*c^(3/2)*ArcT
anh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/6 + (I*c^2*Sqrt[1 + a^2*x^2]*PolyLo
g[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - (I*c^2*Sqrt
[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x
^2]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x}\,dx + \left(a^2c\right)\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx$$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{3}\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)-\frac{1}{3}(ac)\int \sqrt{c+a^2cx^2}\,d\ldots$$

$$= -\frac{1}{6}acx\sqrt{c+a^2cx^2}+c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{3}\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)-\frac{1}{6}\ldots$$

$$= -\frac{1}{6}acx\sqrt{c+a^2cx^2}+c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{3}\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)-\frac{2}{\ldots}\ldots$$

$$= -\frac{1}{6}acx\sqrt{c+a^2cx^2}+c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{3}\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)-\frac{2}{\ldots}\ldots$$

Mathematica [A] time = 0.26, size = 220, normalized size = 0.78

$$c\sqrt{a^2cx^2+c}\left(-ax\sqrt{a^2x^2+1}+2a^2x^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)+8\sqrt{a^2x^2+1}\,\tan^{-1}(ax)+6i\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-6i\text{L}\ldots\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(-(a*x*Sqrt[1 + a^2*x^2]) - ArcSinh[a*x] + 8*Sqrt[1
+ a^2*x^2]*ArcTan[a*x] + 2*a^2*x^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + 6*ArcTan
[a*x]*Log[1 - E^(I*ArcTan[a*x])] - 6*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])]
 + 6*Log[Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2]] - 6*Log[Cos[ArcTan[a*x]/2
] + Sin[ArcTan[a*x]/2]] + (6*I)*PolyLog[2, -E^(I*ArcTan[a*x])] - (6*I)*Poly
Log[2, E^(I*ArcTan[a*x])]))/(6*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.68, size = 174, normalized size = 0.62

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(2\arctan\left(ax\right)x^2a^2-ax+8\arctan\left(ax\right)\right)}{6}+\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(7i\arctan\left(\frac{iax+1}{\sqrt{a^2x^2+1}}\right)+3i\,\mathrm{di}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x,x)
```

```
[Out] 1/6*c*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)*x^2*a^2-a*x+8*arctan(a*x))+1
/3*c*(c*(a*x-I)*(I+a*x))^(1/2)*(7*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))+3*I
*dilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2
+1)^(1/2))+3*I*dilog((1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(a^2cx^2+c\right)\sqrt{a^2x^2+1}\,\sqrt{c}\,\arctan\left(ax\right)-\frac{1}{6}\left(a^4x^4+10\,a^2x^2+9\right)^{\frac{1}{4}}\left(acx\cos\left(\frac{1}{2}\,\arctan\left(4\,ax,-a^2x^2+3\right)\right)+2\,c\sin\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x,x, algorithm="maxima")
```

```
[Out] 1/3*(a^2*c*x^2 + c)*sqrt(a^2*x^2 + 1)*sqrt(c)*arctan(a*x) - 1/6*(a^4*x^4 +
10*a^2*x^2 + 9)^(1/4)*(a*c*x*cos(1/2*arctan2(4*a*x, -a^2*x^2 + 3)) + 2*c*si
n(1/2*arctan2(4*a*x, -a^2*x^2 + 3)))*sqrt(c) + 1/12*(c*arctan2((a^4*x^4 + 1
0*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) + 2, a*x + (a^4*x
```

```
^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 - 3))) + c*arctan
2((a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) - 2
, -a*x + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 -
3))) + 12*c*integrate(sqrt(a^2*x^2 + 1)*arctan(a*x)/x, x))*sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x,x)
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}(ax)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)/x,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)/x, x)
```

3.213 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^2}\,dx$

Optimal. Leaf size=300

$$-ac^{3/2}\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)+\frac{3iac^2\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3iac^2\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3iac^2\sqrt{a^2x^2+1}\,\tan$$

```
[Out] -a*c^(3/2)*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))-3*I*a*c^2*arctan(a*x)*arcta
n((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3/
2*I*a*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)-3/2*I*a*c^2*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))
*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/2*a*c*(a^2*c*x^2+c)^(1/2)-c*arctan
(a*x)*(a^2*c*x^2+c)^(1/2)/x+1/2*a^2*c*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.42, antiderivative size = 300, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4950, 4944, 266, 63, 208, 4890, 4886, 4878}

$$\frac{3iac^2\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3iac^2\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3iac^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\right.}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x^2,x]
```

```
[Out] -(a*c*Sqrt[c + a^2*c*x^2])/2 - (c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x + (a^2
*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/2 - ((3*I)*a*c^2*Sqrt[1 + a^2*x^2]*Ar
cTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - a*
c^(3/2)*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]] + (((3*I)/2)*a*c^2*Sqrt[1 + a^
2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x
^2] - (((3*I)/2)*a*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqr
t[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
```

```
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)}{x^2}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^2}\,dx + (a^2c)\int \sqrt{c+a^2cx^2}\tan^{-1}(ax)\,dx$$

$$= -\frac{1}{2}ac\sqrt{c+a^2cx^2} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + c^2\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx + \frac{1}{2}($$

$$= -\frac{1}{2}ac\sqrt{c+a^2cx^2} - \frac{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + (ac$$

$$= -\frac{1}{2}ac\sqrt{c+a^2cx^2} - \frac{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{3ia}{}$$

$$= -\frac{1}{2}ac\sqrt{c+a^2cx^2} - \frac{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{3ia}{}$$

$$= -\frac{1}{2}ac\sqrt{c+a^2cx^2} - \frac{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{3ia}{}$$

Mathematica [A] time = 0.95, size = 218, normalized size = 0.73

$$\frac{c\sqrt{a^2cx^2+c}\left(-ax\sqrt{a^2x^2+1} + a^2x^2\sqrt{a^2x^2+1}\tan^{-1}(ax) - 2\sqrt{a^2x^2+1}\tan^{-1}(ax) + 3iax\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) - 3iax}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x^2,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(-(a*x*Sqrt[1 + a^2*x^2]) - 2*Sqrt[1 + a^2*x^2]*ArcT
an[a*x] + a^2*x^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + 3*a*x*ArcTan[a*x]*Log[1 -
 I*E^(I*ArcTan[a*x])] - 3*a*x*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] - 2*
a*x*Log[Cos[ArcTan[a*x]/2]] + 2*a*x*Log[Sin[ArcTan[a*x]/2]] + (3*I)*a*x*Pol
yLog[2, (-I)*E^(I*ArcTan[a*x])] - (3*I)*a*x*PolyLog[2, I*E^(I*ArcTan[a*x])]
))/(2*x*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(a^2cx^2+c)^{\frac{3}{2}}\arctan(ax)}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^2,x, algorithm="giac")
```

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 0.70, size = 240, normalized size = 0.80

$$\frac{c\sqrt{c\,(ax-i)\,(ax+i)}\,\left(\arctan\left(ax\right)x^{2}a^{2}-ax-2\arctan\left(ax\right)\right)}{2x}-\frac{\sqrt{c\,(ax-i)\,(ax+i)}\,\left(3\arctan\left(ax\right)\ln\left(1+\frac{i(iax+}{\sqrt{a^{2}x^{2}}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^2,x)
```

```
[Out] 1/2*c*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)*x^2*a^2-a*x-2*arctan(a*x))/x-1
/2*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)*(3*arctan(a*x)*ln(1+I*(1+I*a
*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*
ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)+3*I*d
ilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(
1/2)))*a*c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}\arctan\left(ax\right)}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^{2}\,x^{2}+c\right)}^{3/2}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x^2,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}\left(ax\right)}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)/x**2,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)/x**2, x)
```

3.214 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^3}\,dx$

Optimal. Leaf size=304

$$-a^2c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)+\frac{3ia^2c^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3ia^2c^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3a^2c^2\sqrt{a^2x^2+1}\,\text{t}}{\sqrt{}}$$

```
[Out] -a^2*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))-3*a^2*c^2*arctan(a*x)
*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(
1/2)+3/2*I*a^2*c^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^
(1/2)/(a^2*c*x^2+c)^(1/2)-3/2*I*a^2*c^2*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)
^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/2*a*c*(a^2*c*x^2+c)^(1/2)/x
+a^2*c*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-1/2*c*arctan(a*x)*(a^2*c*x^2+c)^(1/2
)/x^2
```

Rubi [A] time = 0.64, antiderivative size = 304, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4950, 4946, 4962, 264, 4958, 4954, 217, 206}

$$\frac{3ia^2c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3ia^2c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-a^2c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)-\frac{3a^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x^3,x]
```

```
[Out] -(a*c*Sqrt[c + a^2*c*x^2])/(2*x) + a^2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] -
(c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(2*x^2) - (3*a^2*c^2*Sqrt[1 + a^2*x^2]*
ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] -
 a^2*c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]] + (((3*I)/2)*a^2*c^
2*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c
+ a^2*c*x^2] - (((3*I)/2)*a^2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a
*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
```

```
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^3}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^3}\,dx + \left(a^2c\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x}\,dx$$

$$= a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^2} - c^2\int \frac{\tan^{-1}(ax)}{x^3\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{ac\sqrt{c+a^2cx^2}}{x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2x^2} - \frac{1}{2}\left(a\right.$$

$$= -\frac{ac\sqrt{c+a^2cx^2}}{2x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2x^2} - \frac{2a^2c}{}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}}{2x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2x^2} - \frac{3a^2c}{}$$

Mathematica [A] time = 1.70, size = 301, normalized size = 0.99

$$\frac{a^2c\sqrt{a^2cx^2+c}\,\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)\left(12i\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)\cot\left(\frac{1}{2}\tan^{-1}(ax)\right)-12i\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)\cot\left(\frac{1}{2}\tan^{-1}(ax)\right)-\cdots\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x^3,x]
```

```
[Out] (a^2*c*Sqrt[c + a^2*c*x^2]*(-2 - 2*Cot[ArcTan[a*x]/2]^2 + 4*a*x*ArcTan[a*x]
*Csc[ArcTan[a*x]/2]^2 - ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Csc[ArcTan[a*x]/2]^2
 + 12*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Log[1 - E^(I*ArcTan[a*x])] - 12*ArcTan
[a*x]*Cot[ArcTan[a*x]/2]*Log[1 + E^(I*ArcTan[a*x])] + 8*Cot[ArcTan[a*x]/2]*
Log[Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2]] - 8*Cot[ArcTan[a*x]/2]*Log[Cos
[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2]] + (12*I)*Cot[ArcTan[a*x]/2]*PolyLog[2
, -E^(I*ArcTan[a*x])] - (12*I)*Cot[ArcTan[a*x]/2]*PolyLog[2, E^(I*ArcTan[a*
x])] + ArcTan[a*x]*Csc[ArcTan[a*x]/2]*Sec[ArcTan[a*x]/2])*Tan[ArcTan[a*x]/2
])/(8*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.01, size = 180, normalized size = 0.59

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(2\arctan\left(ax\right)x^2a^2-ax-\arctan\left(ax\right)\right)}{2x^2}+\frac{a^2c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(4i\arctan\left(\frac{iax+1}{\sqrt{a^2x^2+1}}\right)+3i\,\mathrm{d}\cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^3,x)
```

```
[Out] 1/2*c*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)*x^2*a^2-a*x-arctan(a*x))/x^2
+1/2*a^2*c*(c*(a*x-I)*(I+a*x))^(1/2)*(4*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2
))+3*I*dilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)*ln(1+(1+I*a*x)/(a
^2*x^2+1)^(1/2))+3*I*dilog((1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{3/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x^3,x)
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}(ax)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)/x**3,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)/x**3, x)
```

3.215 $\int \frac{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)}{x^4}\,dx$

Optimal. Leaf size=310

$$-\frac{ac\sqrt{a^2cx^2+c}}{6x^2}-\frac{a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{x}-\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}{3x^3}-\frac{7}{6}a^3c^{3/2}\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)+\frac{ia^3c^2\sqrt{a^2x^2}}{\sqrt{}}$$

```
[Out] -1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^3-7/6*a^3*c^(3/2)*arctanh((a^2*c*x^2
+c)^(1/2)/c^(1/2))-2*I*a^3*c^2*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)
^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+I*a^3*c^2*polylog(2,-I*(1+I*a
*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-I*a^3*c^2*
polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c
)^(1/2)-1/6*a*c*(a^2*c*x^2+c)^(1/2)/x^2-a^2*c*arctan(a*x)*(a^2*c*x^2+c)^(1/
2)/x
```

Rubi [A] time = 0.43, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4950, 4944, 266, 47, 63, 208, 4890, 4886}

$$\frac{ia^3c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{ia^3c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2ia^3c^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x^4,x]
```

```
[Out] -(a*c*Sqrt[c + a^2*c*x^2])/(6*x^2) - (a^2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
)/x - ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/(3*x^3) - ((2*I)*a^3*c^2*Sqrt[1 +
 a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2
*c*x^2] - (7*a^3*c^(3/2)*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]])/6 + (I*a^3*c
^2*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sq
rt[c + a^2*c*x^2] - (I*a^3*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a
*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^4}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^4}\,dx + \left(a^2c\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^2}\,dx$$

$$= -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3x^3} + \frac{1}{3}(ac)\int \frac{\sqrt{c+a^2cx^2}}{x^3}\,dx + \left(a^2c^2\right)\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3x^3} + \frac{1}{6}(ac)\,\mathrm{Subst}\left(\int \frac{\sqrt{c+a}}{x^2}\right.$$

$$= -\frac{ac\sqrt{c+a^2cx^2}}{6x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3x^3} - \frac{2ia^3c^2}{}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}}{6x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3x^3} - \frac{2ia^3c^2}{}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}}{6x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3x^3} - \frac{2ia^3c^2}{}$$

Mathematica [A] time = 0.50, size = 263, normalized size = 0.85

$$-\frac{c\sqrt{a^2cx^2+c}\left(-6ia^3x^3\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+6ia^3x^3\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)-6a^3x^3\tan^{-1}(ax)\log\left(1-ie^{i\tan^{-1}(ax)}\right)+6a^3x^3\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/x^4,x]
```

```
[Out] -1/6*(c*Sqrt[c + a^2*c*x^2]*(a*x*Sqrt[1 + a^2*x^2] + 2*Sqrt[1 + a^2*x^2]*Ar
cTan[a*x] + 8*a^2*x^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + a^3*x^3*ArcTanh[Sqrt[
1 + a^2*x^2]] - 6*a^3*x^3*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] + 6*a^3*
x^3*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] + 6*a^3*x^3*Log[Cos[ArcTan[a*x
]/2]] - 6*a^3*x^3*Log[Sin[ArcTan[a*x]/2]] - (6*I)*a^3*x^3*PolyLog[2, (-I)*E
^(I*ArcTan[a*x])] + (6*I)*a^3*x^3*PolyLog[2, I*E^(I*ArcTan[a*x])]))/(x^3*Sq
rt[1 + a^2*x^2])
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan(ax)}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^4,x, algorithm="giac")
```

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 1.34, size = 245, normalized size = 0.79

$$-\frac{c\sqrt{c\,(ax-i)\,(ax+i)}\,\left(8\arctan\left(ax\right)x^{2}a^{2}+ax+2\arctan\left(ax\right)\right)}{6x^{3}}+\frac{ia^{3}c\sqrt{c\,(ax-i)\,(ax+i)}\,\left(6i\arctan\left(ax\right)\ln\left(1\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^4,x)

[Out] -1/6*c*(c*(a*x-I)*(I+a*x))^(1/2)*(8*arctan(a*x)*x^2*a^2+a*x+2*arctan(a*x))/x^3+1/6*I*a^3*c*(c*(a*x-I)*(I+a*x))^(1/2)*(6*I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+7*I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-7*I*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)-6*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}\arctan\left(ax\right)}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^4,x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)/x^4, x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^{2}\,x^{2}+c\right)}^{3/2}}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x^4,x)

[Out] int((atan(a*x)*(c + a^2*c*x^2)^(3/2))/x^4, x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}\left(ax\right)}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)/x**4,x)

[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)/x**4, x)

3.216 $\int x^3 \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)\,dx$

Optimal. Leaf size=289

$$\frac{c^2x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{63a^2}+\frac{19}{63}a^2c^2x^6\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)-\frac{103ac^2x^5\sqrt{a^2cx^2+c}}{3024}+\frac{5}{21}c^2x^4\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)$$

```
[Out] 115/8064*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^4+47/2688*c^2*x
*(a^2*c*x^2+c)^(1/2)/a^3-205/12096*c^2*x^3*(a^2*c*x^2+c)^(1/2)/a-103/3024*a
*c^2*x^5*(a^2*c*x^2+c)^(1/2)-1/72*a^3*c^2*x^7*(a^2*c*x^2+c)^(1/2)-2/63*c^2*
arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^4+1/63*c^2*x^2*arctan(a*x)*(a^2*c*x^2+c)^
(1/2)/a^2+5/21*c^2*x^4*arctan(a*x)*(a^2*c*x^2+c)^(1/2)+19/63*a^2*c^2*x^6*ar
ctan(a*x)*(a^2*c*x^2+c)^(1/2)+1/9*a^4*c^2*x^8*arctan(a*x)*(a^2*c*x^2+c)^(1/
2)
```

Rubi [A] time = 1.98, antiderivative size = 289, normalized size of antiderivative = 1.00, number of steps used = 76, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4950, 4946, 4952, 321, 217, 206, 4930}

$$-\frac{1}{72}a^3c^2x^7\sqrt{a^2cx^2+c}-\frac{103ac^2x^5\sqrt{a^2cx^2+c}}{3024}-\frac{205c^2x^3\sqrt{a^2cx^2+c}}{12096a}+\frac{47c^2x\sqrt{a^2cx^2+c}}{2688a^3}+\frac{1}{9}a^4c^2x^8\sqrt{a^2cx^2+c}\,\tan^{-}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (47*c^2*x*Sqrt[c + a^2*c*x^2])/(2688*a^3) - (205*c^2*x^3*Sqrt[c + a^2*c*x^2
])/(12096*a) - (103*a*c^2*x^5*Sqrt[c + a^2*c*x^2])/3024 - (a^3*c^2*x^7*Sqrt
[c + a^2*c*x^2])/72 - (2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(63*a^4) + (c
^2*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(63*a^2) + (5*c^2*x^4*Sqrt[c + a^2*
c*x^2]*ArcTan[a*x])/21 + (19*a^2*c^2*x^6*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/6
3 + (a^4*c^2*x^8*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/9 + (115*c^(5/2)*ArcTanh[
(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(8064*a^4)
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^3 \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)\,dx = c\int x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx + \left(a^2c\right)\int x^5\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx$$

$$= c^2\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx + 2\left(\left(a^2c^2\right)\int x^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx\right) +$$

$$= \frac{1}{5}c^2x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{9}a^4c^2x^8\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{5}c^3\int \frac{x^3\tan^{-}}{\sqrt{c+a}}$$

$$= -\frac{c^2x^3\sqrt{c+a^2cx^2}}{20a} - \frac{1}{72}a^3c^2x^7\sqrt{c+a^2cx^2} + \frac{c^2x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{15a^2} + \frac{1}{5}c^2$$

$$= \frac{c^2x\sqrt{c+a^2cx^2}}{24a^3} - \frac{c^2x^3\sqrt{c+a^2cx^2}}{20a} + \frac{41ac^2x^5\sqrt{c+a^2cx^2}}{3024} - \frac{1}{72}a^3c^2x^7\sqrt{c+a^2c}$$

$$= \frac{c^2x\sqrt{c+a^2cx^2}}{24a^3} - \frac{3761c^2x^3\sqrt{c+a^2cx^2}}{60480a} + \frac{41ac^2x^5\sqrt{c+a^2cx^2}}{3024} - \frac{1}{72}a^3c^2x^7\sqrt{c}$$

$$= \frac{127c^2x\sqrt{c+a^2cx^2}}{2688a^3} - \frac{3761c^2x^3\sqrt{c+a^2cx^2}}{60480a} + \frac{41ac^2x^5\sqrt{c+a^2cx^2}}{3024} - \frac{1}{72}a^3c^2x^7$$

$$= \frac{127c^2x\sqrt{c+a^2cx^2}}{2688a^3} - \frac{3761c^2x^3\sqrt{c+a^2cx^2}}{60480a} + \frac{41ac^2x^5\sqrt{c+a^2cx^2}}{3024} - \frac{1}{72}a^3c^2x^7$$

$$= \frac{127c^2x\sqrt{c+a^2cx^2}}{2688a^3} - \frac{3761c^2x^3\sqrt{c+a^2cx^2}}{60480a} + \frac{41ac^2x^5\sqrt{c+a^2cx^2}}{3024} - \frac{1}{72}a^3c^2x^7$$

Mathematica [A] time = 0.25, size = 129, normalized size = 0.45

$$\frac{c^2\left(345\sqrt{c}\,\log\left(\sqrt{c}\,\sqrt{a^2cx^2+c}\,+acx\right)+384\left(7a^2x^2-2\right)\left(a^2x^2+1\right)^3\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)-ax\left(336a^6x^6+824a\right.\right.}{24192a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (c^2*(-(a*x*Sqrt[c + a^2*c*x^2]*(-423 + 410*a^2*x^2 + 824*a^4*x^4 + 336*a^6
*x^6)) + 384*(1 + a^2*x^2)^3*(-2 + 7*a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*
x] + 345*Sqrt[c]*Log[a*c*x + Sqrt[c]*Sqrt[c + a^2*c*x^2]]))/(24192*a^4)
```

fricas [A] time = 0.56, size = 154, normalized size = 0.53

$$\frac{345\,c^{\frac{5}{2}}\log\left(-2\,a^2cx^2-2\,\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x-c\right)-2\left(336\,a^7c^2x^7+824\,a^5c^2x^5+410\,a^3c^2x^3-423\,ac^2x-384\left(7\,a^8\right.\right.}{48384\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] 1/48384*(345*c^(5/2)*log(-2*a^2*c*x^2 - 2*sqrt(a^2*c*x^2 + c)*a*sqrt(c)*x -
 c) - 2*(336*a^7*c^2*x^7 + 824*a^5*c^2*x^5 + 410*a^3*c^2*x^3 - 423*a*c^2*x
- 384*(7*a^8*c^2*x^8 + 19*a^6*c^2*x^6 + 15*a^4*c^2*x^4 + a^2*c^2*x^2 - 2*c^
2)*arctan(a*x))*sqrt(a^2*c*x^2 + c))/a^4
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 2.67, size = 225, normalized size = 0.78

$$\frac{c^2\sqrt{c(ax-i)(ax+i)}\,\left(2688\arctan(ax)x^8a^8-336x^7a^7+7296\arctan(ax)x^6a^6-824x^5a^5+5760\arctan(ax\right.}{24192a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x)
```

```
[Out] 1/24192*c^2/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(2688*arctan(a*x)*x^8*a^8-336*x^7
*a^7+7296*arctan(a*x)*x^6*a^6-824*x^5*a^5+5760*arctan(a*x)*x^4*a^4-410*a^3*
x^3+384*arctan(a*x)*x^2*a^2+423*a*x-768*arctan(a*x))-115/8064*c^2/a^4*(c*(a
*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-I)/(a^2*x^2+1)^(1/2)+11
5/8064*c^2/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)+I)/
(a^2*x^2+1)^(1/2)
```

maxima [A] time = 0.60, size = 338, normalized size = 1.17

$$-\frac{1}{24192}\left(\left(\left(7\left(\frac{48\left(a^2x^2+1\right)^{\frac{3}{2}}x^5}{a^2}-\frac{40\left(a^2x^2+1\right)^{\frac{3}{2}}x^3}{a^4}+\frac{30\left(a^2x^2+1\right)^{\frac{3}{2}}x}{a^6}-\frac{15\sqrt{a^2x^2+1}\,x}{a^6}-\frac{15\,\mathrm{arsinh}(ax)}{a^7}\right)a^2c^2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/24192*((7*(48*(a^2*x^2 + 1)^(3/2)*x^5/a^2 - 40*(a^2*x^2 + 1)^(3/2)*x^3/a
^4 + 30*(a^2*x^2 + 1)^(3/2)*x/a^6 - 15*sqrt(a^2*x^2 + 1)*x/a^6 - 15*arcsinh
(a*x)/a^7)*a^2*c^2 + 96*(8*(a^2*x^2 + 1)^(3/2)*x^3/a^2 - 6*(a^2*x^2 + 1)^(3
/2)*x/a^4 + 3*sqrt(a^2*x^2 + 1)*x/a^4 + 3*arcsinh(a*x)/a^5)*c^2 + 144*c^2*(
2*(a^2*x^2 + 1)^(3/2)*x/a^2 - sqrt(a^2*x^2 + 1)*x/a^2 - arcsinh(a*x)/a^3)/a
^2 - 384*(sqrt(a^2*x^2 + 1)*x + arcsinh(a*x)/a)*c^2/a^4)*a - 384*(7*(a^2*x^
2 + 1)^(3/2)*a^2*c^2*x^6 + 12*(a^2*x^2 + 1)^(3/2)*c^2*x^4 + 3*(a^2*x^2 + 1)
^(3/2)*c^2*x^2/a^2 - 2*(a^2*x^2 + 1)^(3/2)*c^2/a^4)*arctan(a*x))*sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\mathrm{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^3*atan(a*x)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^3\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**(5/2)*atan(a*x),x)
```

```
[Out] Integral(x**3*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x), x)
```

3.217 $\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)\,dx$

Optimal. Leaf size=418

$$\frac{5c^2x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{128a^2}+\frac{17}{48}a^2c^2x^5\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)+\frac{59}{192}c^2x^3\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)+\frac{1}{8}a^4c^2x^7\sqrt{a^2cx^2+c}$$

```
[Out] 5/576*c*(a^2*c*x^2+c)^(3/2)/a^3+1/240*(a^2*c*x^2+c)^(5/2)/a^3-1/56*(a^2*c*x
^2+c)^(7/2)/a^3/c+5/64*I*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(
1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-5/128*I*c^3*polylog(2,-I*(1
+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+5/
128*I*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^
3/(a^2*c*x^2+c)^(1/2)+5/128*c^2*(a^2*c*x^2+c)^(1/2)/a^3+5/128*c^2*x*arctan(
a*x)*(a^2*c*x^2+c)^(1/2)/a^2+59/192*c^2*x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
+17/48*a^2*c^2*x^5*arctan(a*x)*(a^2*c*x^2+c)^(1/2)+1/8*a^4*c^2*x^7*arctan(a
*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 2.03, antiderivative size = 418, normalized size of antiderivative = 1.00, number of steps used = 51, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4950, 4946, 4952, 261, 4890, 4886, 266, 43}

$$-\frac{5ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{128a^3\sqrt{a^2cx^2+c}}+\frac{5ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{128a^3\sqrt{a^2cx^2+c}}+\frac{5c^2\sqrt{a^2cx^2+c}}{128a^3}+\frac{1}{8}a^4c^2x^7\sqrt{a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (5*c^2*Sqrt[c + a^2*c*x^2])/(128*a^3) + (5*c*(c + a^2*c*x^2)^(3/2))/(576*a^
3) + (c + a^2*c*x^2)^(5/2)/(240*a^3) - (c + a^2*c*x^2)^(7/2)/(56*a^3*c) + (
5*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(128*a^2) + (59*c^2*x^3*Sqrt[c + a
^2*c*x^2]*ArcTan[a*x])/192 + (17*a^2*c^2*x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x
])/48 + (a^4*c^2*x^7*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/8 + (((5*I)/64)*c^3*S
qrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^3*
Sqrt[c + a^2*c*x^2]) - (((5*I)/128)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*
Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + (((5*I)/128)
*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^
3*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)\,dx = c\int x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx+\left(a^2c\right)\int x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx$$

$$= c^2\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx+2\left(\left(a^2c^2\right)\int x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx\right.$$

$$= \frac{1}{4}c^2x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{8}a^4c^2x^7\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{4}c^3\int\frac{x^2\,\mathrm{t}}{\sqrt{c}}$$

$$= \frac{c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{8a^2}+\frac{1}{4}c^2x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{48}a^2c^2x^5\sqrt{c+}$$

$$= -\frac{c^2\sqrt{c+a^2cx^2}}{8a^3}+\frac{c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{8a^2}+\frac{43}{192}c^2x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(a$$

$$= \frac{c^2\sqrt{c+a^2cx^2}}{4a^3}-\frac{5c\left(c+a^2cx^2\right)^{3/2}}{24a^3}+\frac{3\left(c+a^2cx^2\right)^{5/2}}{40a^3}-\frac{\left(c+a^2cx^2\right)^{7/2}}{56a^3c}+\frac{21}{}$$

$$= \frac{73c^2\sqrt{c+a^2cx^2}}{384a^3}-\frac{7c\left(c+a^2cx^2\right)^{3/2}}{36a^3}+\frac{17\left(c+a^2cx^2\right)^{5/2}}{240a^3}-\frac{\left(c+a^2cx^2\right)^{7/2}}{56a^3c}+$$

$$= \frac{21c^2\sqrt{c+a^2cx^2}}{128a^3}-\frac{107c\left(c+a^2cx^2\right)^{3/2}}{576a^3}+\frac{17\left(c+a^2cx^2\right)^{5/2}}{240a^3}-\frac{\left(c+a^2cx^2\right)^{7/2}}{56a^3c}$$

Mathematica [B] time = 15.28, size = 1059, normalized size = 2.53

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (c^2*Sqrt[c*(1 + a^2*x^2)]*((-6*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (6*
I)*PolyLog[2, I*E^(I*ArcTan[a*x])] - ((1 + a^2*x^2)^2*(-2/Sqrt[1 + a^2*x^2]
 - 6*Cos[3*ArcTan[a*x]] + 3*ArcTan[a*x]*((-14*a*x)/Sqrt[1 + a^2*x^2] + 3*Lo
g[1 - I*E^(I*ArcTan[a*x])] + 4*Cos[2*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*
x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + Cos[4*ArcTan[a*x]]*(Log[1 - I*E^(I*A
rcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) - 3*Log[1 + I*E^(I*ArcTan[a*x]
)] + 2*Sin[3*ArcTan[a*x]])))/4))/(48*a^3*Sqrt[1 + a^2*x^2]) + (c^2*Sqrt[c*(
1 + a^2*x^2)]*((90*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (90*I)*PolyLog[2
, I*E^(I*ArcTan[a*x])] + ((1 + a^2*x^2)^3*(12/Sqrt[1 + a^2*x^2] + 110*Cos[3
*ArcTan[a*x]] - 90*Cos[5*ArcTan[a*x]] + 15*ArcTan[a*x]*((156*a*x)/Sqrt[1 +
a^2*x^2] + 30*Log[1 - I*E^(I*ArcTan[a*x])] + 3*Cos[6*ArcTan[a*x]]*Log[1 - I
*E^(I*ArcTan[a*x])] + 45*Cos[2*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] -
 Log[1 + I*E^(I*ArcTan[a*x])]) + 18*Cos[4*ArcTan[a*x]]*(Log[1 - I*E^(I*ArcT
an[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) - 30*Log[1 + I*E^(I*ArcTan[a*x])]
 - 3*Cos[6*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - 94*Sin[3*ArcTan[a*x]
] + 6*Sin[5*ArcTan[a*x]])))/16))/(720*a^3*Sqrt[1 + a^2*x^2]) + (c^2*Sqrt[c*
(1 + a^2*x^2)]*((-3150*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (3150*I)*Pol
yLog[2, I*E^(I*ArcTan[a*x])] - ((1 + a^2*x^2)^4*(38134/Sqrt[1 + a^2*x^2] +
7658*Cos[3*ArcTan[a*x]] + 35*(314*Cos[5*ArcTan[a*x]] - 90*Cos[7*ArcTan[a*x]
] + 3*ArcTan[a*x]*((-3530*a*x)/Sqrt[1 + a^2*x^2] + 525*Log[1 - I*E^(I*ArcTa
n[a*x])] + 120*Cos[6*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + 15*Cos[8*A
rcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + 840*Cos[2*ArcTan[a*x]]*(Log[1 -
I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + 420*Cos[4*ArcTan[a*x
```

```
]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) - 525*Log[
1 + I*E^(I*ArcTan[a*x])] - 120*Cos[6*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x
])] - 15*Cos[8*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] + 1790*Sin[3*ArcTa
n[a*x]] - 794*Sin[5*ArcTan[a*x]] + 30*Sin[7*ArcTan[a*x]]))))/64))/(80640*a^
3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^6 + 2\,a^2c^2x^4 + c^2x^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*sqrt(a^2*c*x^2 + c)*arctan
(a*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.35, size = 245, normalized size = 0.59

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(5040\arctan\left(ax\right)x^7a^7 - 720a^6x^6 + 14280\arctan\left(ax\right)x^5a^5 - 1992a^4x^4 + 12390\arctan\left(ax\right.\right.}{40320a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x)
```

```
[Out] 1/40320*c^2/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(5040*arctan(a*x)*x^7*a^7-720*a^6
*x^6+14280*arctan(a*x)*x^5*a^5-1992*a^4*x^4+12390*arctan(a*x)*x^3*a^3-1474*
a^2*x^2+1575*arctan(a*x)*x*a+1373)+5/128*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(arc
tan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dilog(1-I*(1+I
*a*x)/(a^2*x^2+1)^(1/2)))/a^3/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{5}{2}} x^2 \arctan\left(ax\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^2*arctan(a*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^2*atan(a*x)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2 \left(c \left(a^2x^2 + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}(ax) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(5/2)*atan(a*x),x)
```

```
[Out] Integral(x**2*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x), x)
```

3.218 $\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)\,dx$

Optimal. Leaf size=134

$$-\frac{5c^{5/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{112a^2}-\frac{5c^2x\sqrt{a^2cx^2+c}}{112a}-\frac{x\left(a^2cx^2+c\right)^{5/2}}{42a}-\frac{5cx\left(a^2cx^2+c\right)^{3/2}}{168a}+\frac{\left(a^2cx^2+c\right)^{7/2}\tan^{-1}(ax)}{7a^2c}$$

```
[Out] -5/168*c*x*(a^2*c*x^2+c)^(3/2)/a-1/42*x*(a^2*c*x^2+c)^(5/2)/a+1/7*(a^2*c*x^
2+c)^(7/2)*arctan(a*x)/a^2/c-5/112*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c
)^(1/2))/a^2-5/112*c^2*x*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.09, antiderivative size = 134, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4930, 195, 217, 206}

$$-\frac{5c^2x\sqrt{a^2cx^2+c}}{112a}-\frac{5c^{5/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{112a^2}-\frac{x\left(a^2cx^2+c\right)^{5/2}}{42a}-\frac{5cx\left(a^2cx^2+c\right)^{3/2}}{168a}+\frac{\left(a^2cx^2+c\right)^{7/2}\tan^{-1}(ax)}{7a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (-5*c^2*x*Sqrt[c + a^2*c*x^2])/(112*a) - (5*c*x*(c + a^2*c*x^2)^(3/2))/(168
*a) - (x*(c + a^2*c*x^2)^(5/2))/(42*a) + ((c + a^2*c*x^2)^(7/2)*ArcTan[a*x]
)/(7*a^2*c) - (5*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(112*a
^2)
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)\,dx = \frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)}{7a^2c} - \frac{\int \left(c+a^2cx^2\right)^{5/2}\,dx}{7a}$$
$$= -\frac{x\left(c+a^2cx^2\right)^{5/2}}{42a} + \frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)}{7a^2c} - \frac{(5c)\int \left(c+a^2cx^2\right)^{3/2}\,dx}{42a}$$
$$= -\frac{5cx\left(c+a^2cx^2\right)^{3/2}}{168a} - \frac{x\left(c+a^2cx^2\right)^{5/2}}{42a} + \frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)}{7a^2c} - \frac{\left(5c^2\right)\int}{}$$
$$= -\frac{5c^2x\sqrt{c+a^2cx^2}}{112a} - \frac{5cx\left(c+a^2cx^2\right)^{3/2}}{168a} - \frac{x\left(c+a^2cx^2\right)^{5/2}}{42a} + \frac{\left(c+a^2cx^2\right)^{7/2}\,\mathrm{t}}{7a^2c}$$
$$= -\frac{5c^2x\sqrt{c+a^2cx^2}}{112a} - \frac{5cx\left(c+a^2cx^2\right)^{3/2}}{168a} - \frac{x\left(c+a^2cx^2\right)^{5/2}}{42a} + \frac{\left(c+a^2cx^2\right)^{7/2}\,\mathrm{t}}{7a^2c}$$
$$= -\frac{5c^2x\sqrt{c+a^2cx^2}}{112a} - \frac{5cx\left(c+a^2cx^2\right)^{3/2}}{168a} - \frac{x\left(c+a^2cx^2\right)^{5/2}}{42a} + \frac{\left(c+a^2cx^2\right)^{7/2}\,\mathrm{t}}{7a^2c}$$

Mathematica [A] time = 0.22, size = 111, normalized size = 0.83

$$\frac{c^2\left(-15\sqrt{c}\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+acx\right)+48\left(a^2x^2+1\right)^3\sqrt{a^2cx^2+c}\tan^{-1}(ax)-ax\left(8a^4x^4+26a^2x^2+33\right)\sqrt{a^2}\right.}{336a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (c^2*(-(a*x*Sqrt[c + a^2*c*x^2]*(33 + 26*a^2*x^2 + 8*a^4*x^4)) + 48*(1 + a^
2*x^2)^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] - 15*Sqrt[c]*Log[a*c*x + Sqrt[c]*S
qrt[c + a^2*c*x^2]]))/(336*a^2)
```

fricas [A] time = 0.62, size = 130, normalized size = 0.97

$$\frac{15\,c^{\frac{5}{2}}\log\left(-2\,a^2cx^2+2\,\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x-c\right)-2\left(8\,a^5c^2x^5+26\,a^3c^2x^3+33\,ac^2x-48\left(a^6c^2x^6+3\,a^4c^2x^4+3\right.\right.}{672\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] 1/672*(15*c^(5/2)*log(-2*a^2*c*x^2 + 2*sqrt(a^2*c*x^2 + c)*a*sqrt(c)*x - c)
 - 2*(8*a^5*c^2*x^5 + 26*a^3*c^2*x^3 + 33*a*c^2*x - 48*(a^6*c^2*x^6 + 3*a^4
*c^2*x^4 + 3*a^2*c^2*x^2 + c^2)*arctan(a*x))*sqrt(a^2*c*x^2 + c))/a^2
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 0.90, size = 205, normalized size = 1.53

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\,\left(48\arctan(ax)\,x^6a^6-8x^5a^5+144\arctan(ax)\,x^4a^4-26a^3x^3+144\arctan(ax)\,x^2a^2-3\right.}{336a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x)
```

```
[Out] 1/336*c^2/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(48*arctan(a*x)*x^6*a^6-8*x^5*a^5+1
44*arctan(a*x)*x^4*a^4-26*a^3*x^3+144*arctan(a*x)*x^2*a^2-33*a*x+48*arctan(
a*x))-5/112*c^2/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)/(a^2*x^2+1)^(1/2
)+I)/(a^2*x^2+1)^(1/2)+5/112*c^2/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*ln((1+I*a*x)
/(a^2*x^2+1)^(1/2)-I)/(a^2*x^2+1)^(1/2)
```

maxima [B] time = 0.69, size = 637, normalized size = 4.75

$$560\left(a^2c^2x^2+c^2\right)\sqrt{a^2x^2+1}\,\sqrt{c}\,\arctan(ax)-280\left(a^4x^4+10\,a^2x^2+9\right)^{\frac{1}{4}}\left(ac^2x\cos\left(\frac{1}{2}\arctan\left(4\,ax,-a^2x^2+3\right)\right)+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] 1/1680*(560*(a^2*c^2*x^2 + c^2)*sqrt(a^2*x^2 + 1)*sqrt(c)*arctan(a*x) - 280
*(a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*(a*c^2*x*cos(1/2*arctan2(4*a*x, -a^2*x^2
+ 3)) + 2*c^2*sin(1/2*arctan2(4*a*x, -a^2*x^2 + 3)))*sqrt(c) - ((a*(5*(8*(a
^2*x^2 + 1)^(3/2)*x^3/a^2 - 6*(a^2*x^2 + 1)^(3/2)*x/a^4 + 3*sqrt(a^2*x^2 +
1)*x/a^4 + 3*arcsinh(a*x)/a^5)/a^2 - 24*(2*(a^2*x^2 + 1)^(3/2)*x/a^2 - sqrt
(a^2*x^2 + 1)*x/a^2 - arcsinh(a*x)/a^3)/a^4 + 64*(sqrt(a^2*x^2 + 1)*x + arc
sinh(a*x)/a)/a^6) - 16*(15*(a^2*x^2 + 1)^(3/2)*x^4/a^2 - 12*(a^2*x^2 + 1)^(
3/2)*x^2/a^4 + 8*(a^2*x^2 + 1)^(3/2)/a^6)*arctan(a*x))*a^6*c^2 + 28*(a*(3*(
2*(a^2*x^2 + 1)^(3/2)*x/a^2 - sqrt(a^2*x^2 + 1)*x/a^2 - arcsinh(a*x)/a^3)/a
^2 - 8*(sqrt(a^2*x^2 + 1)*x + arcsinh(a*x)/a)/a^4) - 8*(3*(a^2*x^2 + 1)^(3/
2)*x^2/a^2 - 2*(a^2*x^2 + 1)^(3/2)/a^4)*arctan(a*x))*a^4*c^2 - 140*c^2*arct
an2((a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) +
 2, a*x + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 -
 3))) - 140*c^2*arctan2((a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*
a*x, a^2*x^2 - 3)) - 2, -a*x + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arc
tan2(4*a*x, a^2*x^2 - 3))))*sqrt(c))/a^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x*atan(a*x)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)*atan(a*x),x)
```

```
[Out] Integral(x*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x), x)
```

3.219 $\int \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)\,dx$

Optimal. Leaf size=348

$$\frac{5ic^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{16a\sqrt{a^2cx^2+c}}-\frac{5ic^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{16a\sqrt{a^2cx^2+c}}-\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{5c^2\sqrt{a}}{1}$$

```
[Out] -5/72*c*(a^2*c*x^2+c)^(3/2)/a-1/30*(a^2*c*x^2+c)^(5/2)/a+5/24*c*x*(a^2*c*x^
2+c)^(3/2)*arctan(a*x)+1/6*x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)-5/8*I*c^3*arct
an(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*
x^2+c)^(1/2)+5/16*I*c^3*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*
x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-5/16*I*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(
1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-5/16*c^2*(a^2*c*x^2
+c)^(1/2)/a+5/16*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 348, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4878, 4890, 4886}

$$\frac{5ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{16a\sqrt{a^2cx^2+c}}-\frac{5ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{16a\sqrt{a^2cx^2+c}}-\frac{5c^2\sqrt{a^2cx^2+c}}{16a}-\frac{5ic^3\sqrt{a^2x^2+1}\,\mathrm{t}}{8a}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (-5*c^2*Sqrt[c + a^2*c*x^2])/(16*a) - (5*c*(c + a^2*c*x^2)^(3/2))/(72*a) -
(c + a^2*c*x^2)^(5/2)/(30*a) + (5*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/16
 + (5*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/24 + (x*(c + a^2*c*x^2)^(5/2)*
ArcTan[a*x])/6 - (((5*I)/8)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1
 + I*a*x]/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) + (((5*I)/16)*c^3*Sqrt[
1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c
+ a^2*c*x^2]) - (((5*I)/16)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*
a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2])
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)\,dx=-\frac{\left(c+a^2cx^2\right)^{5/2}}{30a}+\frac{1}{6}x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)+\frac{1}{6}(5c)\int \left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax$$
$$=-\frac{5c\left(c+a^2cx^2\right)^{3/2}}{72a}-\frac{\left(c+a^2cx^2\right)^{5/2}}{30a}+\frac{5}{24}cx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)+\frac{1}{6}x\left(c+a^2\right.$$
$$=-\frac{5c^2\sqrt{c+a^2cx^2}}{16a}-\frac{5c\left(c+a^2cx^2\right)^{3/2}}{72a}-\frac{\left(c+a^2cx^2\right)^{5/2}}{30a}+\frac{5}{16}c^2x\sqrt{c+a^2cx^2}\tan^{-1}($$
$$=-\frac{5c^2\sqrt{c+a^2cx^2}}{16a}-\frac{5c\left(c+a^2cx^2\right)^{3/2}}{72a}-\frac{\left(c+a^2cx^2\right)^{5/2}}{30a}+\frac{5}{16}c^2x\sqrt{c+a^2cx^2}\tan^{-1}($$
$$=-\frac{5c^2\sqrt{c+a^2cx^2}}{16a}-\frac{5c\left(c+a^2cx^2\right)^{3/2}}{72a}-\frac{\left(c+a^2cx^2\right)^{5/2}}{30a}+\frac{5}{16}c^2x\sqrt{c+a^2cx^2}\tan^{-1}($$

Mathematica [A] time = 6.50, size = 643, normalized size = 1.85

$$c^2\sqrt{a^2cx^2+c}\left(\frac{3}{4}\left(a^2x^2+1\right)^{5/2}+720\sqrt{a^2x^2+1}\left(ax\tan^{-1}(ax)-1\right)+\frac{55}{8}\left(a^2x^2+1\right)^3\cos\left(3\tan^{-1}(ax)\right)-\frac{45}{8}\left(a^2x^2+\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*((3*(1 + a^2*x^2)^(5/2))/4 + 720*Sqrt[1 + a^2*x^2]
*(-1 + a*x*ArcTan[a*x]) + (55*(1 + a^2*x^2)^3*Cos[3*ArcTan[a*x]])/8 - (45*(
1 + a^2*x^2)^3*Cos[5*ArcTan[a*x]])/8 + 720*ArcTan[a*x]*(Log[1 - I*E^(I*ArcT
an[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + (450*I)*PolyLog[2, (-I)*E^(I*Ar
cTan[a*x])] - (450*I)*PolyLog[2, I*E^(I*ArcTan[a*x])] - 15*(1 + a^2*x^2)^2*
(-2/Sqrt[1 + a^2*x^2] - 6*Cos[3*ArcTan[a*x]] + 3*ArcTan[a*x]*((-14*a*x)/Sqr
t[1 + a^2*x^2] + 3*Log[1 - I*E^(I*ArcTan[a*x])] + 4*Cos[2*ArcTan[a*x]]*(Log
[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + Cos[4*ArcTan[a*
x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) - 3*Log[1
 + I*E^(I*ArcTan[a*x])] + 2*Sin[3*ArcTan[a*x]])) + (15*(1 + a^2*x^2)^3*ArcT
an[a*x]*((156*a*x)/Sqrt[1 + a^2*x^2] + 30*Log[1 - I*E^(I*ArcTan[a*x])] + 3*
Cos[6*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + 45*Cos[2*ArcTan[a*x]]*(Lo
g[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + 18*Cos[4*ArcTa
n[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) - 30*
Log[1 + I*E^(I*ArcTan[a*x])] - 3*Cos[6*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a
*x])] - 94*Sin[3*ArcTan[a*x]] + 6*Sin[5*ArcTan[a*x]]))/16))/(1440*a*Sqrt[1
+ a^2*x^2])
```

fricas [F] time = 0.81, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 0.61, size = 225, normalized size = 0.65

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\,\left(120\arctan(ax)\,x^5a^5-24a^4x^4+390\arctan(ax)\,x^3a^3-98a^2x^2+495\arctan(ax)\,xa-\right.}{720a}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x),x)

[Out] 1/720*c^2/a*(c*(a*x-I)*(I+a*x))^(1/2)*(120*arctan(a*x)*x^5*a^5-24*a^4*x^4+390*arctan(a*x)*x^3*a^3-98*a^2*x^2+495*arctan(a*x)*x*a-299)-5/16*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a/(a^2*x^2+1)^(1/2)

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(atan(a*x)*(c + a^2*c*x^2)^(5/2),x)

[Out] int(atan(a*x)*(c + a^2*c*x^2)^(5/2), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\mathrm{atan}(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x),x)

[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x), x)

3.220 $\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)}{x}\,dx$

Optimal. Leaf size=329

$$-\frac{149}{120}c^{5/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)+\frac{ic^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{ic^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2c^3\sqrt{a^2x^2+1}\,\tan^{-1}(a\cdots}{\sqrt{a^2cx^2\cdots}}$$

```
[Out] -1/20*a*c*x*(a^2*c*x^2+c)^(3/2)+1/3*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)+1/5*(
a^2*c*x^2+c)^(5/2)*arctan(a*x)-149/120*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x
^2+c)^(1/2))-2*c^3*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^
2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+I*c^3*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*
x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-I*c^3*polylog(2,(1+I*a*x)^(
1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-29/120*a*c^2*x*
(a^2*c*x^2+c)^(1/2)+c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.55, antiderivative size = 329, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4950, 4946, 4958, 4954, 217, 206, 4930, 195}

$$\frac{ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{29}{120}ac^2x\sqrt{a^2cx^2+c}+c^2\sqrt{a^2cx^2+c}\,\tan\cdots$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x,x]
```

```
[Out] (-29*a*c^2*x*Sqrt[c + a^2*c*x^2])/120 - (a*c*x*(c + a^2*c*x^2)^(3/2))/20 +
c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] + (c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])
/3 + ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/5 - (2*c^3*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (149
*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/120 + (I*c^3*Sqrt[1 +
a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2
] - (I*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/S
qrt[c + a^2*c*x^2]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
```

```
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{x}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x}\,dx + \left(a^2c\right)\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx$$

$$= \frac{1}{5}\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax) - \frac{1}{5}(ac)\int \left(c+a^2cx^2\right)^{3/2}\,dx + c^2\int \frac{\sqrt{c+a^2cx^2}\ \mathrm{ta}}{x}$$

$$= -\frac{1}{20}acx\left(c+a^2cx^2\right)^{3/2} + c^2\sqrt{c+a^2cx^2}\ \tan^{-1}(ax) + \frac{1}{3}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

$$= -\frac{29}{120}ac^2x\sqrt{c+a^2cx^2} - \frac{1}{20}acx\left(c+a^2cx^2\right)^{3/2} + c^2\sqrt{c+a^2cx^2}\ \tan^{-1}(ax) + \frac{1}{3}c$$

$$= -\frac{29}{120}ac^2x\sqrt{c+a^2cx^2} - \frac{1}{20}acx\left(c+a^2cx^2\right)^{3/2} + c^2\sqrt{c+a^2cx^2}\ \tan^{-1}(ax) + \frac{1}{3}c$$

$$= -\frac{29}{120}ac^2x\sqrt{c+a^2cx^2} - \frac{1}{20}acx\left(c+a^2cx^2\right)^{3/2} + c^2\sqrt{c+a^2cx^2}\ \tan^{-1}(ax) + \frac{1}{3}c$$

Mathematica [A] time = 0.35, size = 268, normalized size = 0.81

$$\frac{c^2\sqrt{a^2cx^2+c}\left(-35ax\sqrt{a^2x^2+1}+88a^2x^2\sqrt{a^2x^2+1}\tan^{-1}(ax)+184\sqrt{a^2x^2+1}\tan^{-1}(ax)+24a^4x^4\sqrt{a^2x^2+1}\,\mathrm{ta}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x,x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*(-35*a*x*Sqrt[1 + a^2*x^2] - 6*a^3*x^3*Sqrt[1 + a^
2*x^2] - 29*ArcSinh[a*x] + 184*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + 88*a^2*x^2*S
qrt[1 + a^2*x^2]*ArcTan[a*x] + 24*a^4*x^4*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + 1
20*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] - 120*ArcTan[a*x]*Log[1 + E^(I*Ar
cTan[a*x])] + 120*Log[Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2]] - 120*Log[Co
s[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2]] + (120*I)*PolyLog[2, -E^(I*ArcTan[a*
x])] - (120*I)*PolyLog[2, E^(I*ArcTan[a*x])]))/(120*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.74, size = 198, normalized size = 0.60

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(24\arctan\left(ax\right)x^4a^4-6a^3x^3+88\arctan\left(ax\right)x^2a^2-35ax+184\arctan\left(ax\right)\right)}{120}+\frac{c^2\sqrt{c\left(ax-\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x,x)
```

```
[Out] 1/120*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(24*arctan(a*x)*x^4*a^4-6*a^3*x^3+88*ar
ctan(a*x)*x^2*a^2-35*a*x+184*arctan(a*x))+1/60*c^2*(c*(a*x-I)*(I+a*x))^(1/2
)*(149*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))+60*I*dilog(1+(1+I*a*x)/(a^2*x^
2+1)^(1/2))-60*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+60*I*dilog((1+
I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2}{3}\left(a^2c^2x^2+c^2\right)\sqrt{a^2x^2+1}\,\sqrt{c}\,\arctan\left(ax\right)-\frac{1}{3}\left(a^4x^4+10\,a^2x^2+9\right)^{\frac{1}{4}}\left(ac^2x\cos\left(\frac{1}{2}\,\arctan\left(4\,ax,-a^2x^2+3\right)\right)+2\,c^2\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x,x, algorithm="maxima")
```

```
[Out] 2/3*(a^2*c^2*x^2 + c^2)*sqrt(a^2*x^2 + 1)*sqrt(c)*arctan(a*x) - 1/3*(a^4*x^
4 + 10*a^2*x^2 + 9)^(1/4)*(a*c^2*x*cos(1/2*arctan2(4*a*x, -a^2*x^2 + 3)) +
2*c^2*sin(1/2*arctan2(4*a*x, -a^2*x^2 + 3)))*sqrt(c) - 1/120*((a*(3*(2*(a^2
*x^2 + 1)^(3/2)*x/a^2 - sqrt(a^2*x^2 + 1)*x/a^2 - arcsinh(a*x)/a^3)/a^2 - 8
*(sqrt(a^2*x^2 + 1)*x + arcsinh(a*x)/a)/a^4) - 8*(3*(a^2*x^2 + 1)^(3/2)*x^2
/a^2 - 2*(a^2*x^2 + 1)^(3/2)/a^4)*arctan(a*x))*a^4*c^2 - 20*c^2*arctan2((a^
4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2 - 3)) + 2, a*x
 + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a^2*x^2 - 3))) -
 20*c^2*arctan2((a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2
*x^2 - 3)) - 2, -a*x + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a
*x, a^2*x^2 - 3))) - 120*c^2*integrate(sqrt(a^2*x^2 + 1)*arctan(a*x)/x, x))
*sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{5/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}(ax)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)/x,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)/x, x)
```

3.221 $\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)}{x^2}\,dx$

Optimal. Leaf size=355

$$-ac^{5/2}\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)+\frac{15iac^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{8\sqrt{a^2cx^2+c}}-\frac{15iac^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{8\sqrt{a^2cx^2+c}}-\frac{15iac^3\sqrt{a^2x^2+1}}{4\sqrt{}}$$

```
[Out] -1/12*a*c*(a^2*c*x^2+c)^(3/2)+1/4*a^2*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)-a
*c^(5/2)*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))-15/4*I*a*c^3*arctan(a*x)*arct
an((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+1
5/8*I*a*c^3*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)
/(a^2*c*x^2+c)^(1/2)-15/8*I*a*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/
2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-7/8*a*c^2*(a^2*c*x^2+c)^(1/2)-c^2
*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x+7/8*a^2*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^
(1/2)
```

Rubi [A] time = 0.77, antiderivative size = 355, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.364$, Rules used = {4950, 4944, 266, 63, 208, 4890, 4886, 4878}

$$\frac{15iac^3\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{8\sqrt{a^2cx^2+c}}-\frac{15iac^3\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{8\sqrt{a^2cx^2+c}}-\frac{7}{8}ac^2\sqrt{a^2cx^2+c}-\frac{15iac^3\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x^2,x]
```

```
[Out] (-7*a*c^2*Sqrt[c + a^2*c*x^2])/8 - (a*c*(c + a^2*c*x^2)^(3/2))/12 - (c^2*Sq
rt[c + a^2*c*x^2]*ArcTan[a*x])/x + (7*a^2*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[
a*x])/8 + (a^2*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/4 - (((15*I)/4)*a*c^3
*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqr
t[c + a^2*c*x^2] - a*c^(5/2)*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]] + (((15*I
)/8)*a*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a
*x]])/Sqrt[c + a^2*c*x^2] - (((15*I)/8)*a*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2,
(I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{x^2}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^2}\,dx + \left(a^2c\right)\int \left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx$$

$$= -\frac{1}{12}ac\left(c+a^2cx^2\right)^{3/2} + \frac{1}{4}a^2cx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax) + c^2\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}}{x^2}$$

$$= -\frac{7}{8}ac^2\sqrt{c+a^2cx^2} - \frac{1}{12}ac\left(c+a^2cx^2\right)^{3/2} + \frac{7}{8}a^2c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{4}a^2c$$

$$= -\frac{7}{8}ac^2\sqrt{c+a^2cx^2} - \frac{1}{12}ac\left(c+a^2cx^2\right)^{3/2} - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + \frac{7}{8}a^2c^2x\sqrt{c}$$

$$= -\frac{7}{8}ac^2\sqrt{c+a^2cx^2} - \frac{1}{12}ac\left(c+a^2cx^2\right)^{3/2} - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + \frac{7}{8}a^2c^2x\sqrt{c}$$

$$= -\frac{7}{8}ac^2\sqrt{c+a^2cx^2} - \frac{1}{12}ac\left(c+a^2cx^2\right)^{3/2} - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + \frac{7}{8}a^2c^2x\sqrt{c}$$

$$= -\frac{7}{8}ac^2\sqrt{c+a^2cx^2} - \frac{1}{12}ac\left(c+a^2cx^2\right)^{3/2} - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + \frac{7}{8}a^2c^2x\sqrt{c}$$

Mathematica [**A**] time = 4.16, size = 491, normalized size = 1.38

$$\frac{ac^2\sqrt{a^2cx^2+c}\left(-48\left(\frac{\sqrt{a^2x^2+1}\,\tan^{-1}(ax)}{ax} - i\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) + i\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right) + \tan^{-1}(ax)\left(-\log\left(1-ie^{i\tan^{-1}(ax)}\right)\right)\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x^2,x]
```

```
[Out] (a*c^2*Sqrt[c + a^2*c*x^2]*((1 + a^2*x^2)^(3/2)/2 + 48*Sqrt[1 + a^2*x^2]*(-
1 + a*x*ArcTan[a*x]) + (3*(1 + a^2*x^2)^2*Cos[3*ArcTan[a*x]])/2 + 48*ArcTan
[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + (42*I
)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - 48*((Sqrt[1 + a^2*x^2]*ArcTan[a*x])/
(a*x) - ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] + ArcTan[a*x]*Log[1 + I*E^
(I*ArcTan[a*x])] + Log[Cos[ArcTan[a*x]/2]] - Log[Sin[ArcTan[a*x]/2]] - I*Po
lyLog[2, (-I)*E^(I*ArcTan[a*x])] + I*PolyLog[2, I*E^(I*ArcTan[a*x])]) - (42
*I)*PolyLog[2, I*E^(I*ArcTan[a*x])] - (3*(1 + a^2*x^2)^2*ArcTan[a*x]*((-14*
a*x)/Sqrt[1 + a^2*x^2] + 3*Log[1 - I*E^(I*ArcTan[a*x])] + 4*Cos[2*ArcTan[a*
x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + Cos[4*A
rcTan[a*x]]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) -
 3*Log[1 + I*E^(I*ArcTan[a*x])] + 2*Sin[3*ArcTan[a*x]]))/4))/(48*Sqrt[1 + a
^2*x^2])
```

fricas [**F**] time = 0.52, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.79, size = 265, normalized size = 0.75

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\,\left(6\arctan(ax)\,x^4a^4-2a^3x^3+27\arctan(ax)\,x^2a^2-23ax-24\arctan(ax)\right)}{24x}-\frac{\sqrt{c\,(ax-i)}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^2,x)
```

```
[Out] 1/24*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(6*arctan(a*x)*x^4*a^4-2*a^3*x^3+27*arct
an(a*x)*x^2*a^2-23*a*x-24*arctan(a*x))/x-1/8*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2
*x^2+1)^(1/2)*(15*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-15*arctan
(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+8*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2
))-8*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)+15*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))-15*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*a*c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan(ax)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{5/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x^2,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}(ax)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)/x**2,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)/x**2, x)
```

3.222 $\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)}{x^3}\,dx$

Optimal. Leaf size=364

$$-\frac{13}{6}a^2c^{5/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)+\frac{5ia^2c^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{5ia^2c^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{5a^2c^3\sqrt{a^2x^2+}}{}$$

```
[Out] 1/3*a^2*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)-13/6*a^2*c^(5/2)*arctanh(a*x*c^(1
/2)/(a^2*c*x^2+c)^(1/2))-5*a^2*c^3*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I
*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+5/2*I*a^2*c^3*polylog(2,
-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5/2
*I*a^2*c^3*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)-1/2*a*c^2*(a^2*c*x^2+c)^(1/2)/x-1/6*a^3*c^2*x*(a^2*c*x^2+c
)^(1/2)+2*a^2*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-1/2*c^2*arctan(a*x)*(a^2*
c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 1.14, antiderivative size = 364, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4950, 4946, 4962, 264, 4958, 4954, 217, 206, 4930, 195}

$$\frac{5ia^2c^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{5ia^2c^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{1}{6}a^3c^2x\sqrt{a^2cx^2+c}-\frac{ac^2\sqrt{a^2cx^2}}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x^3,x]
```

```
[Out] -(a*c^2*Sqrt[c + a^2*c*x^2])/(2*x) - (a^3*c^2*x*Sqrt[c + a^2*c*x^2])/6 + 2*
a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] - (c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x])/(2*x^2) + (a^2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/3 - (5*a^2*c^3*Sqr
t[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c
 + a^2*c*x^2] - (13*a^2*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])
/6 + (((5*I)/2)*a^2*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt
[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - (((5*I)/2)*a^2*c^3*Sqrt[1 + a^2*x^2]*P
olyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{x^3}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^3}\,dx + \left(a^2c\right)\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x}\,dx$$

$$= c^2\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^3}\,dx + 2\left(\left(a^2c^2\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x}\,dx\right) + \left(a^4c^2\right.$$

$$= -\frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^2} + \frac{1}{3}a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax) - \frac{1}{3}\left(a^3c^2\right)\int \sqrt{c+a^2}$$

$$= -\frac{ac^2\sqrt{c+a^2cx^2}}{x} - \frac{1}{6}a^3c^2x\sqrt{c+a^2cx^2} - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2x^2} + \frac{1}{3}a^2c\left(c+a^2\right.$$

$$= -\frac{ac^2\sqrt{c+a^2cx^2}}{2x} - \frac{1}{6}a^3c^2x\sqrt{c+a^2cx^2} - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2x^2} + \frac{1}{3}a^2c\left(c+a^2\right.$$

$$= -\frac{ac^2\sqrt{c+a^2cx^2}}{2x} - \frac{1}{6}a^3c^2x\sqrt{c+a^2cx^2} - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2x^2} + \frac{1}{3}a^2c\left(c+a^2\right.$$

Mathematica [A] time = 2.08, size = 361, normalized size = 0.99

$$\frac{a^2c^2\sqrt{a^2cx^2+c}\,\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)\left(4a^3x^3\tan^{-1}(ax)\csc^2\left(\frac{1}{2}\tan^{-1}(ax)\right) - 2a^2x^2\csc^2\left(\frac{1}{2}\tan^{-1}(ax)\right) + 60i\text{Li}_2\left(-e^{i\tan}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x^3,x]
```

```
[Out] (a^2*c^2*Sqrt[c + a^2*c*x^2]*(-6 - 4*ArcSinh[a*x]*Cot[ArcTan[a*x]/2] - 6*Co
t[ArcTan[a*x]/2]^2 - 2*a^2*x^2*Csc[ArcTan[a*x]/2]^2 + 28*a*x*ArcTan[a*x]*Cs
c[ArcTan[a*x]/2]^2 + 4*a^3*x^3*ArcTan[a*x]*Csc[ArcTan[a*x]/2]^2 - 3*ArcTan[
a*x]*Cot[ArcTan[a*x]/2]*Csc[ArcTan[a*x]/2]^2 + 60*ArcTan[a*x]*Cot[ArcTan[a*
x]/2]*Log[1 - E^(I*ArcTan[a*x])] - 60*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Log[1
+ E^(I*ArcTan[a*x])] + 48*Cot[ArcTan[a*x]/2]*Log[Cos[ArcTan[a*x]/2] - Sin[A
rcTan[a*x]/2]] - 48*Cot[ArcTan[a*x]/2]*Log[Cos[ArcTan[a*x]/2] + Sin[ArcTan[
a*x]/2]] + (60*I)*Cot[ArcTan[a*x]/2]*PolyLog[2, -E^(I*ArcTan[a*x])] - (60*I
)*Cot[ArcTan[a*x]/2]*PolyLog[2, E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]*Csc[ArcT
an[a*x]/2]*Sec[ArcTan[a*x]/2])*Tan[ArcTan[a*x]/2])/(24*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 1.05, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.08, size = 204, normalized size = 0.56

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\,\left(2\arctan\left(ax\right)x^4a^4-a^3x^3+14\arctan\left(ax\right)x^2a^2-3ax-3\arctan\left(ax\right)\right)}{6x^2}-\frac{\sqrt{c\,(ax-i)\,(ax}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^3,x)
```

```
[Out] 1/6*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)*x^4*a^4-a^3*x^3+14*arctan(
a*x)*x^2*a^2-3*a*x-3*arctan(a*x))/x^2-1/6*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^
2+1)^(1/2)*(-26*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))-15*I*dilog(1+(1+I*a*x
)/(a^2*x^2+1)^(1/2))-15*I*dilog((1+I*a*x)/(a^2*x^2+1)^(1/2))+15*arctan(a*x)
*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2)))*c^2*a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(a^4c^2x^2+a^2c^2\right)\sqrt{a^2x^2+1}\,\sqrt{c}\,\arctan\left(ax\right)-\frac{1}{6}\left(a^4x^4+10\,a^2x^2+9\right)^{\frac{1}{4}}\left(a^3c^2x\cos\left(\frac{1}{2}\,\arctan\left(4\,ax,-a^2x^2+3\right)\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^3,x, algorithm="maxima")
```

```
[Out] 1/3*(a^4*c^2*x^2 + a^2*c^2)*sqrt(a^2*x^2 + 1)*sqrt(c)*arctan(a*x) - 1/6*(a^
4*x^4 + 10*a^2*x^2 + 9)^(1/4)*(a^3*c^2*x*cos(1/2*arctan2(4*a*x, -a^2*x^2 +
3)) + 2*a^2*c^2*sin(1/2*arctan2(4*a*x, -a^2*x^2 + 3)))*sqrt(c) + 1/12*(a^2*
c^2*arctan2((a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*arctan2(4*a*x, a^2*x^2
 - 3)) + 2, a*x + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos(1/2*arctan2(4*a*x, a
^2*x^2 - 3))) + a^2*c^2*arctan2((a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*sin(1/2*ar
ctan2(4*a*x, a^2*x^2 - 3)) - 2, -a*x + (a^4*x^4 + 10*a^2*x^2 + 9)^(1/4)*cos
(1/2*arctan2(4*a*x, a^2*x^2 - 3))) + 24*a^2*c^2*integrate(sqrt(a^2*x^2 + 1)
*arctan(a*x)/x, x) + 12*c^2*integrate(sqrt(a^2*x^2 + 1)*arctan(a*x)/x^3, x)
)*sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x^3,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\,\mathrm{atan}\left(ax\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)/x**3,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)/x**3, x)
```

3.223 $\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{x^4}\,dx$

Optimal. Leaf size=372

$$-\frac{ac^2\sqrt{a^2cx^2+c}}{6x^2}-\frac{2a^2c^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{x}-\frac{c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}{3x^3}+\frac{1}{2}a^4c^2x\sqrt{a^2cx^2+c}\tan^{-1}(ax)-\frac{13}{6}a^3c^{5/}$$

```
[Out] -1/3*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/x^3-13/6*a^3*c^(5/2)*arctanh((a^2*c*
x^2+c)^(1/2)/c^(1/2))-5*I*a^3*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a
*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+5/2*I*a^3*c^3*polylog(2,-I
*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5/2
*I*a^3*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)-1/2*a^3*c^2*(a^2*c*x^2+c)^(1/2)-1/6*a*c^2*(a^2*c*x^2+c)^
(1/2)/x^2-2*a^2*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x+1/2*a^4*c^2*x*arctan(
a*x)*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.98, antiderivative size = 372, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4950, 4944, 266, 47, 63, 208, 4890, 4886, 4878}

$$\frac{5ia^3c^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{5ia^3c^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{1}{2}a^3c^2\sqrt{a^2cx^2+c}-\frac{ac^2\sqrt{a^2cx^2+}}{6x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x^4,x]
```

```
[Out] -(a^3*c^2*Sqrt[c + a^2*c*x^2])/2 - (a*c^2*Sqrt[c + a^2*c*x^2])/(6*x^2) - (2
*a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x + (a^4*c^2*x*Sqrt[c + a^2*c*x^2
]*ArcTan[a*x])/2 - (c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/(3*x^3) - ((5*I)*a
^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]
])/Sqrt[c + a^2*c*x^2] - (13*a^3*c^(5/2)*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c
]])/6 + (((5*I)/2)*a^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*
x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (((5*I)/2)*a^3*c^3*Sqrt[1 + a^2
*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 47

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^n)/(b*(m + 1)), x] - Dist[(d*n)/(b*(m + 1)), I
nt[(a + b*x)^(m + 1)*(c + d*x)^(n - 1), x], x] /; FreeQ[{a, b, c, d}, x] &&
 NeQ[b*c - a*d, 0] && GtQ[n, 0] && LtQ[m, -1] &&  !(IntegerQ[n] &&  !Intege
rQ[m]) &&  !(ILeQ[m + n + 2, 0] && (FractionQ[m] || GeQ[2*n + m + 1, 0])) &
& IntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{x^4}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^4}\,dx + \left(a^2c\right)\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{x^2}\,dx$$

$$= c^2\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^4}\,dx + 2\left(\left(a^2c^2\right)\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x^2}\,dx\right) + \left(a^4c^2\right.$$

$$= -\frac{1}{2}a^3c^2\sqrt{c+a^2cx^2} + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3x^3}$$

$$= -\frac{1}{2}a^3c^2\sqrt{c+a^2cx^2} + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{3x^3}$$

$$= -\frac{1}{2}a^3c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}}{6x^2} + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{c\left(c+a^2\right.}{}$$

$$= -\frac{1}{2}a^3c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}}{6x^2} + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{c\left(c+a^2\right.}{}$$

$$= -\frac{1}{2}a^3c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}}{6x^2} + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{c\left(c+a^2\right.}{}$$

Mathematica [A] time = 1.04, size = 313, normalized size = 0.84

$$\frac{c^2\sqrt{a^2cx^2+c}\left(15ia^3x^3\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) - 15ia^3x^3\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right) + 15a^3x^3\tan^{-1}(ax)\log\left(1-ie^{i\tan^{-1}(ax)}\right) - 15a^3\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/x^4,x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*(-(a*x*Sqrt[1 + a^2*x^2]) - 3*a^3*x^3*Sqrt[1 + a^2
*x^2] - 2*Sqrt[1 + a^2*x^2]*ArcTan[a*x] - 14*a^2*x^2*Sqrt[1 + a^2*x^2]*ArcT
an[a*x] + 3*a^4*x^4*Sqrt[1 + a^2*x^2]*ArcTan[a*x] - a^3*x^3*ArcTanh[Sqrt[1
+ a^2*x^2]] + 15*a^3*x^3*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] - 15*a^3*
x^3*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] - 12*a^3*x^3*Log[Cos[ArcTan[a*
x]/2]] + 12*a^3*x^3*Log[Sin[ArcTan[a*x]/2]] + (15*I)*a^3*x^3*PolyLog[2, (-I
)*E^(I*ArcTan[a*x])] - (15*I)*a^3*x^3*PolyLog[2, I*E^(I*ArcTan[a*x])]))/(6*
x^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2+c}\,\arctan(ax)}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.42, size = 270, normalized size = 0.73

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\,\left(3\arctan(ax)\,x^4a^4-3a^3x^3-14\arctan(ax)\,x^2a^2-ax-2\arctan(ax)\right)}{6x^3}+\frac{ia^3c^2\sqrt{c\,(ax-i}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^4,x)
```

```
[Out] 1/6*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(3*arctan(a*x)*x^4*a^4-3*a^3*x^3-14*arcta
n(a*x)*x^2*a^2-a*x-2*arctan(a*x))/x^3+1/6*I*a^3*c^2*(c*(a*x-I)*(I+a*x))^(1/
2)*(15*I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-15*I*arctan(a*x)*l
n(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+13*I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-1
3*I*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)+15*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))-15*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan(ax)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)/x^4,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)/x^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{5/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x^4,x)
```

```
[Out] int((atan(a*x)*(c + a^2*c*x^2)^(5/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\mathrm{atan}(ax)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)/x**4,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)/x**4, x)
```

3.224 $\int \frac{x^3 \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}} \, dx$

Optimal. Leaf size=120

$$\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3a^2c}-\frac{2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3a^4c}+\frac{5\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{6a^4\sqrt{c}}-\frac{x\sqrt{a^2cx^2+c}}{6a^3c}$$

```
[Out] 5/6*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^4/c^(1/2)-1/6*x*(a^2*c*x^2+c
)^(1/2)/a^3/c-2/3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^4/c+1/3*x^2*arctan(a*x)
*(a^2*c*x^2+c)^(1/2)/a^2/c
```

Rubi [A] time = 0.15, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.227$, Rules used = {4952, 321, 217, 206, 4930}

$$-\frac{x\sqrt{a^2cx^2+c}}{6a^3c}+\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3a^2c}-\frac{2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3a^4c}+\frac{5\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{6a^4\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] -(x*Sqrt[c + a^2*c*x^2])/(6*a^3*c) - (2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3
*a^4*c) + (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*a^2*c) + (5*ArcTanh[(a*S
qrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(6*a^4*Sqrt[c])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
```

```
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx = \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^2c} - \frac{2\int \frac{x\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{3a^2} - \frac{\int \frac{x^2}{\sqrt{c+a^2cx^2}}\,dx}{3a}$$
$$= -\frac{x\sqrt{c+a^2cx^2}}{6a^3c} - \frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^4c} + \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^2c} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}}\,dx}{6a^3} +$$
$$= -\frac{x\sqrt{c+a^2cx^2}}{6a^3c} - \frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^4c} + \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^2c} + \frac{\text{Subst}\left(\int \frac{1}{1-a^2cx^2}\right.}{6a}$$
$$= -\frac{x\sqrt{c+a^2cx^2}}{6a^3c} - \frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^4c} + \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^2c} + \frac{5\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{c+a^2cx^2}}\right.}{6a^4\sqrt{c}}$$

Mathematica [A] time = 0.13, size = 91, normalized size = 0.76

$$\frac{-ax\sqrt{a^2cx^2+c}+5\sqrt{c}\,\log\left(\sqrt{c}\,\sqrt{a^2cx^2+c}+acx\right)+2\left(a^2x^2-2\right)\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{6a^4c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (-(a*x*Sqrt[c + a^2*c*x^2]) + 2*(-2 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x] + 5*Sqrt[c]*Log[a*c*x + Sqrt[c]*Sqrt[c + a^2*c*x^2]])/(6*a^4*c)
```

fricas [A] time = 0.66, size = 80, normalized size = 0.67

$$-\frac{2\sqrt{a^2cx^2+c}\left(ax-2\left(a^2x^2-2\right)\arctan\left(ax\right)\right)-5\sqrt{c}\,\log\left(-2\,a^2cx^2-2\,\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x-c\right)}{12\,a^4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] -1/12*(2*sqrt(a^2*c*x^2 + c)*(a*x - 2*(a^2*x^2 - 2)*arctan(a*x)) - 5*sqrt(c
)*log(-2*a^2*c*x^2 - 2*sqrt(a^2*c*x^2 + c)*a*sqrt(c)*x - c))/(a^4*c)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 3.16, size = 165, normalized size = 1.38

$$\frac{\left(2\arctan\left(ax\right)x^2a^2-ax-4\arctan\left(ax\right)\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{6c\,a^4}+\frac{5\ln\left(\frac{iax+1}{\sqrt{a^2x^2+1}}+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{6\sqrt{a^2x^2+1}\;a^4c}-\frac{5\ln\left(\frac{i}{\sqrt{a}}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/6*(2*arctan(a*x)*x^2*a^2-a*x-4*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)/c/a
^4+5/6*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)+I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2
+1)^(1/2)/a^4/c-5/6*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-I)*(c*(a*x-I)*(I+a*x))^(
1/2)/(a^2*x^2+1)^(1/2)/a^4/c
```

maxima [A] time = 0.47, size = 89, normalized size = 0.74

$$-\frac{a\left(\frac{\frac{\sqrt{a^2x^2+1}\,x}{a^2}-\frac{\operatorname{arsinh}(ax)}{a^3}}{a^2}-\frac{4\,\operatorname{arsinh}(ax)}{a^5}\right)-2\left(\frac{\sqrt{a^2x^2+1}\,x^2}{a^2}-\frac{2\,\sqrt{a^2x^2+1}}{a^4}\right)\arctan(ax)}{6\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] -1/6*(a*((sqrt(a^2*x^2 + 1)*x/a^2 - arcsinh(a*x)/a^3)/a^2 - 4*arcsinh(a*x)/
a^5) - 2*(sqrt(a^2*x^2 + 1)*x^2/a^2 - 2*sqrt(a^2*x^2 + 1)/a^4)*arctan(a*x))
/sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\mathrm{atan}\left(a\,x\right)}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^3*atan(a*x))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\,\mathrm{atan}\,(ax)}{\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**3*atan(a*x)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.225 $\int \frac{x^2 \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}} \, dx$

Optimal. Leaf size=250

$$\frac{x\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{2a^2c}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2a^3\sqrt{a^2cx^2+c}}+\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2a^3\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}}{2a^3c}+\frac{i\sqrt{a^2x^2+1}\tan^{-1}}{a^3\sqrt{a}}$$

```
[Out] I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3
/(a^2*c*x^2+c)^(1/2)-1/2*I*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a
^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/2*I*polylog(2,I*(1+I*a*x)^(1/2)/(
1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-1/2*(a^2*c*x^2+c)
^(1/2)/a^3/c+1/2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2/c
```

Rubi [A] time = 0.15, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4952, 261, 4890, 4886}

$$-\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a^3\sqrt{a^2cx^2+c}}+\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a^3\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}}{2a^3c}+\frac{i\sqrt{a^2x^2+1}\tan^{-1}\left(\frac{\sqrt{1+ia}}{\sqrt{1-ia}}\right.}{a^3\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] -Sqrt[c + a^2*c*x^2]/(2*a^3*c) + (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(2*a^2
*c) + (I*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*
x]])/(a^3*Sqrt[c + a^2*c*x^2]) - ((I/2)*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*
Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + ((I/2)*Sqrt[
1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c +
 a^2*c*x^2])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
```

```
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int \frac{x^2\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx = \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2a^2c} - \frac{\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{2a^2} - \frac{\int \frac{x}{\sqrt{c+a^2cx^2}}\,dx}{2a}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2a^2c} - \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)}{\sqrt{1+a^2x^2}}\,dx}{2a^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^3\sqrt{c+a^2cx^2}} - \frac{i\sqrt{1+a^2}}{2a^3}$$

Mathematica [A] time = 0.62, size = 158, normalized size = 0.63

$$-\frac{\sqrt{c\left(a^2x^2+1\right)}\left(\sqrt{a^2x^2+1} - ax\sqrt{a^2x^2+1}\,\tan^{-1}(ax) + i\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) - i\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right) + \tan^{-1}(ax)\log\left(1\right.\right.}{2a^3c\sqrt{a^2x^2+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] -1/2*(Sqrt[c*(1 + a^2*x^2)]*(Sqrt[1 + a^2*x^2] - a*x*Sqrt[1 + a^2*x^2]*ArcT
an[a*x] + ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] - ArcTan[a*x]*Log[1 + I*
E^(I*ArcTan[a*x])] + I*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - I*PolyLog[2, I*
E^(I*ArcTan[a*x])]))/(a^3*c*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^2\arctan(ax)}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(x^2*arctan(a*x)/sqrt(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.03, size = 184, normalized size = 0.74

$$\frac{(\arctan(ax)xa-1)\sqrt{c(ax-i)(ax+i)}}{2c\,a^3} - \frac{i\left(i\arctan(ax)\ln\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right) - i\arctan(ax)\ln\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right) + \text{dilog}\right.}{2\sqrt{a^2x^2+1}\,a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/2*(arctan(a*x)*x*a-1)*(c*(a*x-I)*(I+a*x))^(1/2)/c/a^3-1/2*I*(I*arctan(a*x
)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x
^2+1)^(1/2))+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-I*(1+I*a*x)/(a^
2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^3/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)}{\sqrt{a^2cx^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arctan(a*x)/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\, \mathrm{atan}(a\,x)}{\sqrt{c\,a^2\,x^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^2*atan(a*x))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \operatorname{atan}(ax)}{\sqrt{c\left(a^2x^2+1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*atan(a*x)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.226 $\int \frac{x\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=59

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{a^2c}-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{a^2\sqrt{c}}$$

[Out] -arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^2/c^(1/2)+arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2/c

Rubi [A] time = 0.06, antiderivative size = 59, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4930, 217, 206}

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{a^2c}-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{a^2\sqrt{c}}$$

Antiderivative was successfully verified.

[In] Int[(x*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]

[Out] (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(a^2*c) - ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]]/(a^2*Sqrt[c])

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx &= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2c}-\frac{\int \frac{1}{\sqrt{c+a^2cx^2}}\,dx}{a}\\
&= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2c}-\frac{\text{Subst}\left(\int \frac{1}{1-a^2cx^2}\,dx,x,\frac{x}{\sqrt{c+a^2cx^2}}\right)}{a}\\
&= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2c}-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{c+a^2cx^2}}\right)}{a^2\sqrt{c}}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 60, normalized size = 1.02

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)-\sqrt{c}\,\log\left(\sqrt{c}\,\sqrt{a^2cx^2+c}\,+acx\right)}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*ArcTan[a*x] - Sqrt[c]*Log[a*c*x + Sqrt[c]*Sqrt[c + a^2
*c*x^2]])/(a^2*c)
```

fricas [A] time = 0.56, size = 64, normalized size = 1.08

$$\frac{2\,\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)+\sqrt{c}\,\log\left(-2\,a^2cx^2+2\,\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x-c\right)}{2\,a^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*(2*sqrt(a^2*c*x^2 + c)*arctan(a*x) + sqrt(c)*log(-2*a^2*c*x^2 + 2*sqrt(
a^2*c*x^2 + c)*a*sqrt(c)*x - c))/(a^2*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.92, size = 144, normalized size = 2.44

$$\frac{\arctan\left(ax\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{a^2c}-\frac{\ln\left(\frac{iax+1}{\sqrt{a^2x^2+1}}+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{\sqrt{a^2x^2+1}\;a^2c}+\frac{\ln\left(\frac{iax+1}{\sqrt{a^2x^2+1}}-i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{\sqrt{a^2x^2+1}\;a^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] arctan(a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/a^2/c-ln((1+I*a*x)/(a^2*x^2+1)^(1/2)+
I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^2/c+ln((1+I*a*x)/(a^2*x^2+
1)^(1/2)-I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^2/c
```

maxima [A] time = 0.49, size = 61, normalized size = 1.03

$$\frac{2\,\sqrt{a^2x^2+1}\,\arctan\left(ax\right)-\log\left(ax+\sqrt{a^2x^2+1}\right)+\log\left(-ax+\sqrt{a^2x^2+1}\right)}{2\,a^2\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/2*(2*sqrt(a^2*x^2 + 1)*arctan(a*x) - log(a*x + sqrt(a^2*x^2 + 1)) + log(-
a*x + sqrt(a^2*x^2 + 1)))/(a^2*sqrt(c))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x*atan(a*x))/(c + a^2*c*x^2)^(1/2), x)
```

sympy **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Exception raised: TypeError
```

3.227 $\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=193

$$\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}$$

```
[Out] -2*I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/
a/(a^2*c*x^2+c)^(1/2)+I*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*
x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-I*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^
(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 193, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {4890, 4886}

$$\frac{i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] ((-2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x
]])/(a*Sqrt[c + a^2*c*x^2]) + (I*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1
+ I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) - (I*Sqrt[1 + a^2*x^2]*
PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2])
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx &= \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)}{\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}\\ &= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{c+a^2cx^2}}+\frac{i\sqrt{1+a^2x^2}\,\mathrm{Li}_2\left(-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{c+a^2cx^2}}-\frac{i\sqrt{1+a^2x^2}\,\mathrm{Li}_2\left(\frac{i}{\right.}\right.}{a\sqrt{c+a^2cx}}\end{aligned}$$

Mathematica [A] time = 0.11, size = 118, normalized size = 0.61

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(i\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)-i\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+\tan^{-1}(ax)\left(\log\left(1-ie^{i\tan^{-1}(ax)}\right)-\log\left(1+ie^{i\tan^{-1}(ax)}\right)\right)\right)}{ac\sqrt{a^2x^2+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 +
 I*E^(I*ArcTan[a*x])]) + I*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - I*PolyLog[2
, I*E^(I*ArcTan[a*x])]))/(a*c*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan\left(ax\right)}{\sqrt{a^2cx^2+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)/sqrt(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.59, size = 150, normalized size = 0.78

$$\frac{i\left(i\arctan\left(ax\right)\ln\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-i\arctan\left(ax\right)\ln\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)+\text{dilog}\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-\text{dilog}\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)\right)\sqrt{c}}{\sqrt{a^2x^2+1}\,ca}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] I*(I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-
I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)
/c/a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)}{\sqrt{a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}(ax)}{\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.228 $\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=177

$$\frac{i\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}$$

```
[Out] -2*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)+I*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1
)^(1/2)/(a^2*c*x^2+c)^(1/2)-I*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a
^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4958, 4954}

$$\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])
/Sqrt[c + a^2*c*x^2] + (I*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sq
rt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - (I*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt
[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] && !GtQ[d, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx &= \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)}{x\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}\\ &= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}}+\frac{i\sqrt{1+a^2x^2}\,\text{Li}_2\left(-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}}-\frac{i\sqrt{1+a^2x^2}\,\text{Li}_2\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.14, size = 100, normalized size = 0.56

$$\frac{\sqrt{a^2x^2+1}\left(i\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-i\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+\tan^{-1}(ax)\left(\log\left(1-e^{i\tan^{-1}(ax)}\right)-\log\left(1+e^{i\tan^{-1}(ax)}\right)\right)\right)}{\sqrt{c\left(a^2x^2+1\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*(ArcTan[a*x]*(Log[1 - E^(I*ArcTan[a*x])] - Log[1 + E^(I*
ArcTan[a*x])]) + I*PolyLog[2, -E^(I*ArcTan[a*x])] - I*PolyLog[2, E^(I*ArcTa
n[a*x])]))/Sqrt[c*(1 + a^2*x^2)]
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)}{a^2cx^3+cx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/(a^2*c*x^3 + c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.67, size = 139, normalized size = 0.79

$$-\frac{i\left(-i\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)\arctan(ax)+i\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)\arctan(ax)+\operatorname{polylog}\left(2,\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-\operatorname{polylog}\left(2,-\frac{ia}{\sqrt{a^2}}\right.\right.}{\sqrt{a^2x^2+1}\;c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -I*(-I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*
x^2+1)^(1/2))*arctan(a*x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,
-(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/
c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)}{\sqrt{a^2cx^2+c}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/(sqrt(a^2*c*x^2 + c)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{\mathrm{atan}(a\,x)}{x\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)/(x*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}(ax)}{x\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)/(x*sqrt(c*(a**2*x**2 + 1))), x)
```

3.229 $\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=56

$$-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{cx}-\frac{a\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{\sqrt{c}}$$

```
[Out] -a*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(1/2)-arctan(a*x)*(a^2*c*x^2+c)^(
1/2)/c/x
```

Rubi [A] time = 0.09, antiderivative size = 56, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4944, 266, 63, 208}

$$-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{cx}-\frac{a\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(c*x)) - (a*ArcTanh[Sqrt[c + a^2*c*x^2]
/Sqrt[c]])/Sqrt[c]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} + a\int \frac{1}{x\sqrt{c+a^2cx^2}}\,dx$$
$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} + \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x\sqrt{c+a^2cx}}\,dx, x, x^2\right)$$
$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} + \frac{\text{Subst}\left(\int \frac{1}{-\frac{1}{a^2}+\frac{x^2}{a^2c}}\,dx, x, \sqrt{c+a^2cx^2}\right)}{ac}$$
$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{a\tanh^{-1}\left(\frac{\sqrt{c+a^2cx^2}}{\sqrt{c}}\right)}{\sqrt{c}}$$

Mathematica [A] time = 0.10, size = 62, normalized size = 1.11

$$\frac{a\left(\log(x)-\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+c\right)\right)}{\sqrt{c}} - \frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{cx}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(c*x)) + (a*(Log[x] - Log[c + Sqrt[c]*S
qrt[c + a^2*c*x^2]]))/Sqrt[c]
```

fricas [A] time = 0.60, size = 68, normalized size = 1.21

$$\frac{a\sqrt{c}\,x\log\left(-\frac{a^2cx^2-2\sqrt{a^2cx^2+c}\sqrt{c}+2c}{x^2}\right)-2\sqrt{a^2cx^2+c}\arctan(ax)}{2\,cx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/2*(a*sqrt(c)*x*log(-(a^2*c*x^2 - 2*sqrt(a^2*c*x^2 + c)*sqrt(c) + 2*c)/x^2
) - 2*sqrt(a^2*c*x^2 + c)*arctan(a*x))/(c*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.58, size = 139, normalized size = 2.48

$$-\frac{\arctan(ax)\sqrt{c(ax-i)(ax+i)}}{cx}+\frac{a\ln\left(\frac{iax+1}{\sqrt{a^2x^2+1}}-1\right)\sqrt{c(ax-i)(ax+i)}}{\sqrt{a^2x^2+1}\;c}-\frac{a\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)\sqrt{c(ax-i)(ax+i)}}{\sqrt{a^2x^2+1}\;c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^2/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -arctan(a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/c/x+a*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)
-1)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c-a*ln(1+(1+I*a*x)/(a^2*x^2
+1)^(1/2))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c
```

maxima [A] time = 0.48, size = 36, normalized size = 0.64

$$-\frac{a \operatorname{arsinh}\left(\frac{1}{a|x|}\right) + \frac{\sqrt{a^2x^2+1} \arctan(ax)}{x}}{\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] -(a*arcsinh(1/(a*abs(x))) + sqrt(a^2*x^2 + 1)*arctan(a*x)/x)/sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\operatorname{atan}(a\,x)}{x^2\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}(ax)}{x^2\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**2/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)/(x**2*sqrt(c*(a**2*x**2 + 1))), x)
```

3.230 $\int \frac{\tan^{-1}(ax)}{x^3\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=242

$$-\frac{ia^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}+\frac{ia^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{a\sqrt{a^2cx^2+c}}{2cx}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{2cx^2}+\frac{a^2\sqrt{a^2x^2+1}\,\text{ta}}{}$$

```
[Out] a^2*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/
(a^2*c*x^2+c)^(1/2)-1/2*I*a^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(
a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+1/2*I*a^2*polylog(2,(1+I*a*x)^(1/2)/(1
-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/2*a*(a^2*c*x^2+c)^(1
/2)/c/x-1/2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/c/x^2
```

Rubi [A] time = 0.22, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4962, 264, 4958, 4954}

$$-\frac{ia^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}+\frac{ia^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2\sqrt{a^2cx^2+c}}-\frac{a\sqrt{a^2cx^2+c}}{2cx}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{2cx^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -(a*Sqrt[c + a^2*c*x^2])/(2*c*x) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(2*c*x
^2) + (a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I
*a*x]])/Sqrt[c + a^2*c*x^2] - ((I/2)*a^2*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqr
t[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] + ((I/2)*a^2*Sqrt[1 + a
^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
```

```
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^3\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2cx^2}+\frac{1}{2}a\int \frac{1}{x^2\sqrt{c+a^2cx^2}}\,dx-\frac{1}{2}a^2\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx$$
$$= -\frac{a\sqrt{c+a^2cx^2}}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2cx^2}-\frac{\left(a^2\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)}{x\sqrt{1+a^2x^2}}\,dx}{2\sqrt{c+a^2cx^2}}$$
$$= -\frac{a\sqrt{c+a^2cx^2}}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2cx^2}+\frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}}-$$

Mathematica [A] time = 0.72, size = 165, normalized size = 0.68

$$\frac{a^2\sqrt{a^2x^2+1}\left(-4i\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)+4i\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)-2\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)-4\tan^{-1}(ax)\log\left(1-e^{i\tan^{-1}(ax)}\right)\right.}{8\sqrt{}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (a^2*Sqrt[1 + a^2*x^2]*(-2*Cot[ArcTan[a*x]/2] - ArcTan[a*x]*Csc[ArcTan[a*x]
/2]^2 - 4*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] + 4*ArcTan[a*x]*Log[1 + E^
(I*ArcTan[a*x])] - (4*I)*PolyLog[2, -E^(I*ArcTan[a*x])] + (4*I)*PolyLog[2,
E^(I*ArcTan[a*x])] + ArcTan[a*x]*Sec[ArcTan[a*x]/2]^2 - 2*Tan[ArcTan[a*x]/2
]))/(8*Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)}{a^2cx^5+cx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/(a^2*c*x^5 + c*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.10, size = 175, normalized size = 0.72

$$-\frac{(ax+\arctan(ax))\sqrt{c(ax-i)(ax+i)}}{2x^2c}+\frac{ia^2\left(-i\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)\arctan(ax)+i\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)\arctan(ax)\right.}{2\sqrt{a^2x}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -1/2*(a*x+arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)/x^2/c+1/2*I*a^2*(-I*ln(1+(
1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))
*arctan(a*x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*a*x)/(a
^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\sqrt{a^2cx^2+c}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/(sqrt(a^2*c*x^2 + c)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)}{x^3\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{atan}(ax)}{x^3\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)/(x**3*sqrt(c*(a**2*x**2 + 1))), x)
```

3.231 $\int \frac{\tan^{-1}(ax)}{x^4\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=118

$$-\frac{a\sqrt{a^2cx^2+c}}{6cx^2}+\frac{2a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3cx}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3cx^3}+\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{6\sqrt{c}}$$

```
[Out] 5/6*a^3*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(1/2)-1/6*a*(a^2*c*x^2+c)^(1
/2)/c/x^2-1/3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/c/x^3+2/3*a^2*arctan(a*x)*(a^
2*c*x^2+c)^(1/2)/c/x
```

Rubi [A] time = 0.20, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4962, 266, 51, 63, 208, 4944}

$$-\frac{a\sqrt{a^2cx^2+c}}{6cx^2}+\frac{2a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3cx}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3cx^3}+\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{6\sqrt{c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -(a*Sqrt[c + a^2*c*x^2])/(6*c*x^2) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*c
*x^3) + (2*a^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*c*x) + (5*a^3*ArcTanh[Sq
rt[c + a^2*c*x^2]/Sqrt[c]])/(6*Sqrt[c])
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
```

```
b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\tan^{-1}(ax)}{x^4\sqrt{c+a^2cx^2}}\,dx &= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^3}+\frac{1}{3}a\int \frac{1}{x^3\sqrt{c+a^2cx^2}}\,dx-\frac{1}{3}\left(2a^2\right)\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx\\
&= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^3}+\frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx}+\frac{1}{6}a\,\mathrm{Subst}\left(\int \frac{1}{x^2\sqrt{c+a^2cx}}\,dx,x,x\right.\\
&= -\frac{a\sqrt{c+a^2cx^2}}{6cx^2}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^3}+\frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx}-\frac{1}{12}a^3\,\mathrm{Subst}\left(\int \frac{}{x\sqrt{}}\right.\\
&= -\frac{a\sqrt{c+a^2cx^2}}{6cx^2}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^3}+\frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx}-\frac{a\,\mathrm{Subst}\left(\int \frac{1}{-\frac{1}{a^2}+\frac{x^2}{a^2c}}\right.}{6}\\
&= -\frac{a\sqrt{c+a^2cx^2}}{6cx^2}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^3}+\frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx}+\frac{5a^3\tanh^{-1}\left(\frac{\sqrt{c+a^2c}}{\sqrt{c}}\right.}{6\sqrt{c}}
\end{aligned}
$$

Mathematica [A] time = 0.12, size = 110, normalized size = 0.93

$$
\frac{-5a^3\sqrt{c}\,x^3\log(x)-ax\sqrt{a^2cx^2+c}+2\left(2a^2x^2-1\right)\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)+5a^3\sqrt{c}\,x^3\log\left(\sqrt{c}\,\sqrt{a^2cx^2+c}+c\right)}{6cx^3}
$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-(a*x*Sqrt[c + a^2*c*x^2]) + 2*(-1 + 2*a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan
[a*x] - 5*a^3*Sqrt[c]*x^3*Log[x] + 5*a^3*Sqrt[c]*x^3*Log[c + Sqrt[c]*Sqrt[c
 + a^2*c*x^2]])/(6*c*x^3)
```

fricas [A] time = 0.65, size = 89, normalized size = 0.75

$$
\frac{5\,a^3\sqrt{c}\,x^3\log\left(-\frac{a^2cx^2+2\,\sqrt{a^2cx^2+c}\,\sqrt{c}+2\,c}{x^2}\right)-2\,\sqrt{a^2cx^2+c}\left(ax-2\left(2\,a^2x^2-1\right)\arctan\left(ax\right)\right)}{12\,cx^3}
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] 1/12*(5*a^3*sqrt(c)*x^3*log(-(a^2*c*x^2 + 2*sqrt(a^2*c*x^2 + c)*sqrt(c) + 2
*c)/x^2) - 2*sqrt(a^2*c*x^2 + c)*(a*x - 2*(2*a^2*x^2 - 1)*arctan(a*x)))/(c*
x^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 3.23, size = 163, normalized size = 1.38

$$\frac{\left(4\arctan\left(ax\right)x^{2}a^{2}-ax-2\arctan\left(ax\right)\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{6c\,x^{3}}+\frac{5a^{3}\ln\left(1+\frac{iax+1}{\sqrt{a^{2}x^{2}+1}}\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{6\sqrt{a^{2}x^{2}+1}\,c}-\frac{5a^{3}\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^4/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/6*(4*arctan(a*x)*x^2*a^2-a*x-2*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)/c/x
^3+5/6*a^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2
*x^2+1)^(1/2)/c-5/6*a^3*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)*(c*(a*x-I)*(I+a*x
))^(1/2)/(a^2*x^2+1)^(1/2)/c
```

maxima [A] time = 0.50, size = 81, normalized size = 0.69

$$\frac{\left(5\,a^{2}\operatorname{arsinh}\left(\frac{1}{a|x|}\right)-\frac{\sqrt{a^{2}x^{2}+1}}{x^{2}}\right)a+2\left(\frac{2\,\sqrt{a^{2}x^{2}+1}\,a^{2}}{x}-\frac{\sqrt{a^{2}x^{2}+1}}{x^{3}}\right)\arctan\left(ax\right)}{6\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/6*((5*a^2*arcsinh(1/(a*abs(x))) - sqrt(a^2*x^2 + 1)/x^2)*a + 2*(2*sqrt(a^
2*x^2 + 1)*a^2/x - sqrt(a^2*x^2 + 1)/x^3)*arctan(a*x))/sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}\left(a\,x\right)}{x^4\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^4*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)/(x^4*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}\left(ax\right)}{x^{4}\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**4/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)/(x**4*sqrt(c*(a**2*x**2 + 1))), x)
```

3.232 $\int \frac{x^3 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}} dx$

Optimal. Leaf size=107

$$-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{a^2cx^2+c}}\right)}{a^4c^{3/2}}+\frac{\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{a^4c^2}+\frac{\tan^{-1}(ax)}{a^4c\sqrt{a^2cx^2+c}}-\frac{x}{a^3c\sqrt{a^2cx^2+c}}$$

```
[Out] -arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^4/c^(3/2)-x/a^3/c/(a^2*c*x^2+c)
^(1/2)+arctan(a*x)/a^4/c/(a^2*c*x^2+c)^(1/2)+arctan(a*x)*(a^2*c*x^2+c)^(1/2
)/a^4/c^2
```

Rubi [A] time = 0.20, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4964, 4930, 217, 206, 191}

$$\frac{\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{a^4c^2}-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{a^2cx^2+c}}\right)}{a^4c^{3/2}}-\frac{x}{a^3c\sqrt{a^2cx^2+c}}+\frac{\tan^{-1}(ax)}{a^4c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -(x/(a^3*c*Sqrt[c + a^2*c*x^2])) + ArcTan[a*x]/(a^4*c*Sqrt[c + a^2*c*x^2])
+ (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(a^4*c^2) - ArcTanh[(a*Sqrt[c]*x)/Sqrt[
c + a^2*c*x^2]]/(a^4*c^(3/2))
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx = -\frac{\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2}+\frac{\int \frac{x\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{a^2c}$$

$$=\frac{\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}}+\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^4c^2}-\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^3}-\frac{\int \frac{1}{\sqrt{c+a^2cx^2}}\,dx}{a^3c}$$

$$=-\frac{x}{a^3c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}}+\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^4c^2}-\frac{\text{Subst}\left(\int \frac{1}{1-a^2cx^2}\,dx,x,-\right.}{a^3c}$$

$$=-\frac{x}{a^3c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}}+\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^4c^2}-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{c+a^2cx^2}}\right)}{a^4c^{3/2}}$$

Mathematica [A] time = 0.13, size = 107, normalized size = 1.00

$$\frac{-ax\sqrt{a^2cx^2+c}-\sqrt{c}\left(a^2x^2+1\right)\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+acx\right)+\left(a^2x^2+2\right)\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{a^4c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (-(a*x*Sqrt[c + a^2*c*x^2]) + (2 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
 - Sqrt[c]*(1 + a^2*x^2)*Log[a*c*x + Sqrt[c]*Sqrt[c + a^2*c*x^2]])/(a^4*c^2
*(1 + a^2*x^2))
```

fricas [A] time = 0.62, size = 102, normalized size = 0.95

$$\frac{\left(a^2x^2+1\right)\sqrt{c}\,\log\left(-2\,a^2cx^2+2\,\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x-c\right)-2\,\sqrt{a^2cx^2+c}\left(ax-\left(a^2x^2+2\right)\arctan(ax)\right)}{2\left(a^6c^2x^2+a^4c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*((a^2*x^2 + 1)*sqrt(c)*log(-2*a^2*c*x^2 + 2*sqrt(a^2*c*x^2 + c)*a*sqrt(
c)*x - c) - 2*sqrt(a^2*c*x^2 + c)*(a*x - (a^2*x^2 + 2)*arctan(a*x)))/(a^6*c
^2*x^2 + a^4*c^2)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 3.02, size = 242, normalized size = 2.26

$$\frac{(i+\arctan(ax))\,(iax+1)\sqrt{c\,(ax-i)\,(ax+i)}}{2\left(a^2x^2+1\right)a^4c^2}-\frac{\sqrt{c\,(ax-i)\,(ax+i)}\;(iax-1)\,(\arctan(ax)-i)}{2\left(a^2x^2+1\right)a^4c^2}+\frac{\arctan(ax)\sqrt{c}}{a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/a^4/c^2
-1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)-I)/(a^2*x^2+1)/a^4/c
^2+arctan(a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/a^4/c^2+ln((1+I*a*x)/(a^2*x^2+1)^(
1/2)-I)/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^4/c^2-ln((1+I*a*x)/(a
^2*x^2+1)^(1/2)+I)/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^4/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\mathrm{atan}\left(a\,x\right)}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^3*atan(a*x))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Exception raised: TypeError
```

3.233 $\int \frac{x^2 \tan^{-1}(ax)}{(c+a^2cx^2)^{3/2}} dx$

Optimal. Leaf size=251

$$-\frac{x\tan^{-1}(ax)}{a^2c\sqrt{a^2cx^2+c}}+\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{1}{a^3c\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}\left(\right.}{a^3c\sqrt{a^2c}}$$

```
[Out] -1/a^3/c/(a^2*c*x^2+c)^(1/2)-x*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(1/2)-2*I*ar
ctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(
a^2*c*x^2+c)^(1/2)+I*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2
+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)-I*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)
^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4934, 4890, 4886}

$$\frac{i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{1}{a^3c\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}\left(\right.}{a^3c\sqrt{a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -(1/(a^3*c*Sqrt[c + a^2*c*x^2])) - (x*ArcTan[a*x])/(a^2*c*Sqrt[c + a^2*c*x^
2]) - ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 -
I*a*x]])/(a^3*c*Sqrt[c + a^2*c*x^2]) + (I*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I
)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*c*Sqrt[c + a^2*c*x^2]) - (I*Sqrt[
1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*c*Sqrt[c
 + a^2*c*x^2])
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4934

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^2*((d_) + (e_.)*(x_)^2)^(q_), x
_Symbol] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c^3*d*(q + 1)^2), x] + (-Dist[
1/(2*c^2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] +
Simp[(x*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*c^2*d*(q + 1)), x]) /;
FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -5/2]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx = -\frac{1}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} + \frac{\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{a^2c}$$

$$= -\frac{1}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)}{\sqrt{1+a^2x^2}}\,dx}{a^2c\sqrt{c+a^2cx^2}}$$

$$= -\frac{1}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^3c\sqrt{c+a^2cx^2}} + \frac{i\sqrt{1+a^2x^2}}{a^3c\sqrt{}}$$

Mathematica [A] time = 0.25, size = 155, normalized size = 0.62

$$-\frac{\sqrt{a^2x^2+1}\left(\frac{1}{\sqrt{a^2x^2+1}}+\frac{ax\tan^{-1}(ax)}{\sqrt{a^2x^2+1}}-i\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+i\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+\tan^{-1}(ax)\left(-\log\left(1-ie^{i\tan^{-1}(ax)}\right)\right)+\right.}{a^3c\sqrt{c\left(a^2x^2+1\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -((Sqrt[1 + a^2*x^2]*(1/Sqrt[1 + a^2*x^2] + (a*x*ArcTan[a*x])/Sqrt[1 + a^2*
x^2] - ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] + ArcTan[a*x]*Log[1 + I*E^(
I*ArcTan[a*x])] - I*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + I*PolyLog[2, I*E^(
I*ArcTan[a*x])]))/(a^3*c*Sqrt[c*(1 + a^2*x^2)]))
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2\arctan(ax)}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 +
 c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.00, size = 247, normalized size = 0.98

$$-\frac{(i+\arctan(ax))(ax-i)\sqrt{c(ax-i)(ax+i)}}{2\left(a^2x^2+1\right)c^2a^3}-\frac{\sqrt{c(ax-i)(ax+i)}\,(ax+i)(\arctan(ax)-i)}{2\left(a^2x^2+1\right)c^2a^3}+\frac{i\left(i\arctan(ax)\ln\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2/a^3-
1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)-I)/(a^2*x^2+1)/c^2/a^3+I
*(I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(1
+I*a*x)/(a^2*x^2+1)^(1/2))+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-I
*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/
c^2/a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arctan(a*x)/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2 \operatorname{atan}(a\,x)}{\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^2*atan(a*x))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \operatorname{atan}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**2*atan(a*x)/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.234 $\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=49

$$\frac{x}{ac\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)}{a^2c\sqrt{a^2cx^2+c}}$$

```
[Out] x/a/c/(a^2*c*x^2+c)^(1/2)-arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4930, 191}

$$\frac{x}{ac\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)}{a^2c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] x/(a*c*Sqrt[c + a^2*c*x^2]) - ArcTan[a*x]/(a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx &= -\frac{\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a}\\ &= \frac{x}{ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.05, size = 42, normalized size = 0.86

$$\frac{\sqrt{a^2cx^2+c}\left(ax-\tan^{-1}(ax)\right)}{a^2c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(a*x - ArcTan[a*x]))/(a^2*c^2*(1 + a^2*x^2))
```

fricas [A] time = 0.62, size = 43, normalized size = 0.88

$$\frac{\sqrt{a^2cx^2+c}\,(ax-\arctan(ax))}{a^4c^2x^2+a^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] sqrt(a^2*c*x^2 + c)*(a*x - arctan(a*x))/(a^4*c^2*x^2 + a^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [C] time = 0.86, size = 100, normalized size = 2.04

$$-\frac{(i+\arctan(ax))(iax+1)\sqrt{c(ax-i)(ax+i)}}{2\left(a^2x^2+1\right)c^2a^2}+\frac{\sqrt{c(ax-i)(ax+i)}\ (iax-1)(\arctan(ax)-i)}{2\left(a^2x^2+1\right)c^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x)
[Out] -1/2*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2/a^
2+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)-I)/(a^2*x^2+1)/c^2/
a^2
```

maxima [A] time = 0.50, size = 28, normalized size = 0.57

$$\frac{ax-\arctan(ax)}{\sqrt{a^2x^2+1}\,a^2c^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] (a*x - arctan(a*x))/(sqrt(a^2*x^2 + 1)*a^2*c^(3/2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,\mathrm{atan}(a\,x)}{\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x))/(c + a^2*c*x^2)^(3/2),x)
[Out] int((x*atan(a*x))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)/(a**2*c*x**2+c)**(3/2),x)
[Out] Exception raised: TypeError
```

3.235 $\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=45

$$\frac{1}{ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}$$

```
[Out] 1/a/c/(a^2*c*x^2+c)^(1/2)+x*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.02, antiderivative size = 45, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4894}

$$\frac{1}{ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] 1/(a*c*Sqrt[c + a^2*c*x^2]) + (x*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2])
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\frac{1}{ac\sqrt{c+a^2cx^2}}+\frac{x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.05, size = 38, normalized size = 0.84

$$\frac{\sqrt{a^2cx^2+c}\left(ax\tan^{-1}(ax)+1\right)}{c^2\left(a^3x^2+a\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(1 + a*x*ArcTan[a*x]))/(c^2*(a + a^3*x^2))
```

fricas [A] time = 1.19, size = 40, normalized size = 0.89

$$\frac{\sqrt{a^2cx^2+c}\,(ax\arctan(ax)+1)}{a^3c^2x^2+ac^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(a^2*c*x^2 + c)*(a*x*arctan(a*x) + 1)/(a^3*c^2*x^2 + a*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.46, size = 98, normalized size = 2.18

$$\frac{(i+\arctan(ax))(ax-i)\sqrt{c(ax-i)(ax+i)}}{2(a^2x^2+1)c^2a}+\frac{\sqrt{c(ax-i)(ax+i)}\,(ax+i)(\arctan(ax)-i)}{2(a^2x^2+1)c^2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2/a+1/2
*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)-I)/(a^2*x^2+1)/c^2/a
```

maxima [A] time = 0.34, size = 41, normalized size = 0.91

$$\frac{x\arctan(ax)}{\sqrt{a^2cx^2+c}\,c}+\frac{1}{\sqrt{a^2cx^2+c}\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] x*arctan(a*x)/(sqrt(a^2*c*x^2 + c)*c) + 1/(sqrt(a^2*c*x^2 + c)*a*c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{atan}(a\,x)}{\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{atan}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.236 $\int \frac{\tan^{-1}(ax)}{x(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=229

$$\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}-\frac{ax}{c\sqrt{a^2cx^2+c}}+\frac{\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tanh^{-1}}{c\sqrt{a^2cx^2+c}}$$

```
[Out] -a*x/c/(a^2*c*x^2+c)^(1/2)+arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)-2*arctan(a*x)*
arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^
(1/2)+I*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^
2*c*x^2+c)^(1/2)-I*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(
1/2)/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.28, antiderivative size = 229, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4966, 4958, 4954, 4930, 191}

$$\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}-\frac{ax}{c\sqrt{a^2cx^2+c}}+\frac{\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\mathrm{ta}}{c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] -((a*x)/(c*Sqrt[c + a^2*c*x^2])) + ArcTan[a*x]/(c*Sqrt[c + a^2*c*x^2]) - (2
*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(c
*Sqrt[c + a^2*c*x^2]) + (I*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/S
qrt[1 - I*a*x])])/(c*Sqrt[c + a^2*c*x^2]) - (I*Sqrt[1 + a^2*x^2]*PolyLog[2,
 Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^{3/2}}\,dx &= -\left(a^2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx}{c}\\ &= \frac{\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-a\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx+\frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)}{x\sqrt{1+a^2x^2}}\,dx}{c\sqrt{c+a^2cx^2}}\\ &= -\frac{ax}{c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{2\sqrt{1+a^2x^2}\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c\sqrt{c+a^2cx^2}}+\frac{i\sqrt{1+a^2x}\ldots}{c\sqrt{c}\ldots}\end{aligned}$$

Mathematica [A] time = 0.23, size = 141, normalized size = 0.62

$$\frac{\sqrt{a^2x^2+1}\left(-\frac{ax}{\sqrt{a^2x^2+1}}+\frac{\tan^{-1}(ax)}{\sqrt{a^2x^2+1}}+i\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-i\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+\tan^{-1}(ax)\log\left(1-e^{i\tan^{-1}(ax)}\right)-\tan^{-1}\ldots\right.}{c\sqrt{c\left(a^2x^2+1\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*(-((a*x)/Sqrt[1 + a^2*x^2]) + ArcTan[a*x]/Sqrt[1 + a^2*x
^2] + ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] - ArcTan[a*x]*Log[1 + E^(I*Arc
Tan[a*x])] + I*PolyLog[2, -E^(I*ArcTan[a*x])] - I*PolyLog[2, E^(I*ArcTan[a*
x])]))/(c*Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\arctan(ax)}{a^4c^2x^5+2a^2c^2x^3+c^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/(a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2
*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.66, size = 232, normalized size = 1.01

$$\frac{(i+\arctan(ax))(iax+1)\sqrt{c(ax-i)(ax+i)}}{2(a^2x^2+1)c^2}-\frac{\sqrt{c(ax-i)(ax+i)}\,(iax-1)(\arctan(ax)-i)}{2(a^2x^2+1)c^2}-\frac{i\left(-i\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2-1/2
*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)-I)/(a^2*x^2+1)/c^2-I*(-I
*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)
^(1/2))*arctan(a*x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*
a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^(3/2)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)}{x\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)/(x*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{atan}(ax)}{x\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)/(x*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.237 $\int \frac{\tan^{-1}(ax)}{x^2(c+a^2cx^2)^{3/2}} \, dx$

Optimal. Leaf size=103

$$-\frac{a\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{c^{3/2}}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{c^2x}-\frac{a}{c\sqrt{a^2cx^2+c}}-\frac{a^2x\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}$$

```
[Out] -a*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(3/2)-a/c/(a^2*c*x^2+c)^(1/2)-a^2
*x*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)-arctan(a*x)*(a^2*c*x^2+c)^(1/2)/c^2/x
```

Rubi [A] time = 0.20, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4966, 4944, 266, 63, 208, 4894}

$$-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{c^2x}-\frac{a\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{c^{3/2}}-\frac{a}{c\sqrt{a^2cx^2+c}}-\frac{a^2x\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] -(a/(c*Sqrt[c + a^2*c*x^2])) - (a^2*x*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2])
- (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(c^2*x) - (a*ArcTanh[Sqrt[c + a^2*c*x^2
]/Sqrt[c]])/c^(3/2)
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
```

```
& NeQ[m, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{a}{c\sqrt{c+a^2cx^2}}-\frac{a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x}+\frac{a\int \frac{1}{x\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{a}{c\sqrt{c+a^2cx^2}}-\frac{a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x}+\frac{a\,\text{Subst}\left(\int \frac{1}{x\sqrt{c+a^2cx}}\,dx,x,x^2\right)}{2c}$$

$$= -\frac{a}{c\sqrt{c+a^2cx^2}}-\frac{a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x}+\frac{\text{Subst}\left(\int \frac{1}{-\frac{1}{a^2}+\frac{x^2}{a^2c}}\,dx,x,\sqrt{c+a^2cx^2}\right)}{ac^2}$$

$$= -\frac{a}{c\sqrt{c+a^2cx^2}}-\frac{a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x}-\frac{a\tanh^{-1}\left(\frac{\sqrt{c+a^2cx^2}}{\sqrt{c}}\right)}{c^{3/2}}$$

Mathematica [A] time = 0.19, size = 122, normalized size = 1.18

$$-\frac{a\log\left(\sqrt{c}\sqrt{c\left(a^2x^2+1\right)}+c\right)}{c^{3/2}}-\frac{a\sqrt{c\left(a^2x^2+1\right)}}{c^2\left(a^2x^2+1\right)}-\frac{\left(2a^2x^2+1\right)\sqrt{c\left(a^2x^2+1\right)}\,\tan^{-1}(ax)}{c^2x\left(a^2x^2+1\right)}+\frac{a\log(x)}{c^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] -((a*Sqrt[c*(1 + a^2*x^2)])/(c^2*(1 + a^2*x^2))) - (Sqrt[c*(1 + a^2*x^2)]*(
1 + 2*a^2*x^2)*ArcTan[a*x])/(c^2*x*(1 + a^2*x^2)) + (a*Log[x])/c^(3/2) - (a
*Log[c + Sqrt[c]*Sqrt[c*(1 + a^2*x^2)]])/c^(3/2)
```

fricas [A] time = 0.71, size = 104, normalized size = 1.01

$$\frac{\left(a^3x^3+ax\right)\sqrt{c}\,\log\left(-\frac{a^2cx^2-2\,\sqrt{a^2cx^2+c}\,\sqrt{c}+2\,c}{x^2}\right)-2\,\sqrt{a^2cx^2+c}\left(ax+\left(2\,a^2x^2+1\right)\arctan\left(ax\right)\right)}{2\left(a^2c^2x^3+c^2x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/2*((a^3*x^3 + a*x)*sqrt(c)*log(-(a^2*c*x^2 - 2*sqrt(a^2*c*x^2 + c)*sqrt(c
) + 2*c)/x^2) - 2*sqrt(a^2*c*x^2 + c)*(a*x + (2*a^2*x^2 + 1)*arctan(a*x)))/
(a^2*c^2*x^3 + c^2*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.59, size = 231, normalized size = 2.24

$$-\frac{a\left(i+\arctan\left(ax\right)\right)\left(ax-i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^{2}x^{2}+1\right)c^{2}}-\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(ax+i\right)\left(\arctan\left(ax\right)-i\right)a}{2\left(a^{2}x^{2}+1\right)c^{2}}-\frac{\arctan\left(ax\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*a*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2-1/
2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)-I)*a/(a^2*x^2+1)/c^2-arcta
n(a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/x/c^2-a*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))/
(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2+a*ln((1+I*a*x)/(a^2*x^2+1)^
(1/2)-1)/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)}{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^(3/2)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)}{x^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}{\left(ax \right)}}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)/(x**2*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.238 $\int \frac{\tan^{-1}(ax)}{x^3(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=300

$$-\frac{a\sqrt{a^2cx^2+c}}{2c^2x}-\frac{\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{2c^2x^2}-\frac{3ia^2\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2c\sqrt{a^2cx^2+c}}+\frac{3ia^2\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2c\sqrt{a^2cx^2+c}}-\frac{a^2\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}$$

```
[Out] a^3*x/c/(a^2*c*x^2+c)^(1/2)-a^2*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)+3*a^2*arc
tan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*
c*x^2+c)^(1/2)-3/2*I*a^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x
^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)+3/2*I*a^2*polylog(2,(1+I*a*x)^(1/2)/(1-I*
a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-1/2*a*(a^2*c*x^2+c)^(1/
2)/c^2/x-1/2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/c^2/x^2
```

Rubi [A] time = 0.61, antiderivative size = 300, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4966, 4962, 264, 4958, 4954, 4930, 191}

$$-\frac{3ia^2\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2c\sqrt{a^2cx^2+c}}+\frac{3ia^2\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2c\sqrt{a^2cx^2+c}}-\frac{a\sqrt{a^2cx^2+c}}{2c^2x}-\frac{\sqrt{a^2cx^2+c}\tan^{-1}(a}{2c^2x^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (a^3*x)/(c*Sqrt[c + a^2*c*x^2]) - (a*Sqrt[c + a^2*c*x^2])/(2*c^2*x) - (a^2*
ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2]) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(2
*c^2*x^2) + (3*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sq
rt[1 - I*a*x]])/(c*Sqrt[c + a^2*c*x^2]) - (((3*I)/2)*a^2*Sqrt[1 + a^2*x^2]*
PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/(c*Sqrt[c + a^2*c*x^2]) + (
((3*I)/2)*a^2*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]]
)/(c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
```

```
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^3\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^{3/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x^3\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2c^2x^2}+a^4\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx+\frac{a\int \frac{1}{x^2\sqrt{c+a^2cx^2}}\,dx}{2c}-\frac{a^2\int \frac{\tan^{-1}(a}{x\sqrt{c+a^2c}}}{2c}$$

$$= -\frac{a\sqrt{c+a^2cx^2}}{2c^2x}-\frac{a^2\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2c^2x^2}+a^3\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx-$$

$$= \frac{a^3x}{c\sqrt{c+a^2cx^2}}-\frac{a\sqrt{c+a^2cx^2}}{2c^2x}-\frac{a^2\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2c^2x^2}+\frac{3a^2\sqrt{1+a^2}}{}$$

Mathematica [A] time = 1.32, size = 258, normalized size = 0.86

$$-\frac{a^2\left(12i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-12i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+2\sqrt{a^2x^2+1}\,\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)+12\sqrt{a^2x}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x^3*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] -1/8*(a^2*(-8*a*x + 8*ArcTan[a*x] + a*x*Csc[ArcTan[a*x]/2]^2 + Sqrt[1 + a^2
*x^2]*ArcTan[a*x]*Csc[ArcTan[a*x]/2]^2 + 12*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*L
```

```
og[1 - E^(I*ArcTan[a*x])] - 12*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Log[1 + E^(I*A
rcTan[a*x])] + (12*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, -E^(I*ArcTan[a*x])] - (1
2*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, E^(I*ArcTan[a*x])] - Sqrt[1 + a^2*x^2]*Ar
cTan[a*x]*Sec[ArcTan[a*x]/2]^2 + 2*Sqrt[1 + a^2*x^2]*Tan[ArcTan[a*x]/2]))/(
c*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)}{a^4c^2x^7+2\,a^2c^2x^5+c^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/(a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2
*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.12, size = 273, normalized size = 0.91

$$-\frac{a^2(i+\arctan(ax))(iax+1)\sqrt{c(ax-i)(ax+i)}}{2\left(a^2x^2+1\right)c^2}+\frac{\sqrt{c(ax-i)(ax+i)}\;(iax-1)(\arctan(ax)-i)a^2}{2\left(a^2x^2+1\right)c^2}-\frac{(ax+\arcta}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^3/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*a^2*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^
2+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)-I)*a^2/(a^2*x^2+1)/
c^2-1/2*(a*x+arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)/c^2/x^2+3/2*I*a^2*(-I*l
n(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(
1/2))*arctan(a*x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*a*
x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^3/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^(3/2)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)}{x^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(atan(a*x)/(x^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}(ax)}{x^3\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**3/(a**2*c*x**2+c)**(3/2),x)
[Out] Integral(atan(a*x)/(x**3*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.239 $\int \frac{\tan^{-1}(ax)}{x^4(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=165

$$-\frac{a\sqrt{a^2cx^2+c}}{6c^2x^2}+\frac{5a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3c^2x}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3c^2x^3}+\frac{a^4x\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}+\frac{11a^3\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{6c^{3/2}}+\frac{\ldots}{c\sqrt{a\ldots}}$$

```
[Out] 11/6*a^3*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(3/2)+a^3/c/(a^2*c*x^2+c)^(
1/2)+a^4*x*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)-1/6*a*(a^2*c*x^2+c)^(1/2)/c^2/
x^2-1/3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/c^2/x^3+5/3*a^2*arctan(a*x)*(a^2*c*
x^2+c)^(1/2)/c^2/x
```

Rubi [A] time = 0.49, antiderivative size = 165, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4966, 4962, 266, 51, 63, 208, 4944, 4894}

$$-\frac{a\sqrt{a^2cx^2+c}}{6c^2x^2}+\frac{5a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3c^2x}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3c^2x^3}+\frac{11a^3\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{6c^{3/2}}+\frac{a^3}{c\sqrt{a^2cx^2+c}}+\frac{a^4x\,\mathrm{t}\ldots}{c\sqrt{a^2\ldots}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] a^3/(c*Sqrt[c + a^2*c*x^2]) - (a*Sqrt[c + a^2*c*x^2])/(6*c^2*x^2) + (a^4*x*
ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2]) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3
*c^2*x^3) + (5*a^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*c^2*x) + (11*a^3*Arc
Tanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]])/(6*c^(3/2))
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] && !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^4\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x^4\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^3}+a^4\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx+\frac{a\int \frac{1}{x^3\sqrt{c+a^2cx^2}}\,dx}{3c}-\frac{\left(2a^2\right)\int \frac{\tan}{x^2\sqrt{c}}}{3c}$$

$$= \frac{a^3}{c\sqrt{c+a^2cx^2}}+\frac{a^4x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^3}+\frac{5a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x}$$

$$= \frac{a^3}{c\sqrt{c+a^2cx^2}}-\frac{a\sqrt{c+a^2cx^2}}{6c^2x^2}+\frac{a^4x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^3}+\frac{5a^2\sqrt{c+a}}{}$$

$$= \frac{a^3}{c\sqrt{c+a^2cx^2}}-\frac{a\sqrt{c+a^2cx^2}}{6c^2x^2}+\frac{a^4x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^3}+\frac{5a^2\sqrt{c+a}}{}$$

$$= \frac{a^3}{c\sqrt{c+a^2cx^2}}-\frac{a\sqrt{c+a^2cx^2}}{6c^2x^2}+\frac{a^4x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^3}+\frac{5a^2\sqrt{c+a}}{}$$

Mathematica [A]   time = 0.34, size = 143, normalized size = 0.87

$$\frac{-11a^3\sqrt{c}\log(x)+\frac{a(5a^2x^2-1)\sqrt{a^2cx^2+c}}{a^2x^4+x^2}+\frac{2(8a^4x^4+4a^2x^2-1)\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{a^2x^5+x^3}+11a^3\sqrt{c}\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+c\right)}{6c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^4*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] ((a*(-1 + 5*a^2*x^2)*Sqrt[c + a^2*c*x^2])/(x^2 + a^2*x^4) + (2*Sqrt[c + a^2
*c*x^2]*(-1 + 4*a^2*x^2 + 8*a^4*x^4)*ArcTan[a*x])/(x^3 + a^2*x^5) - 11*a^3*
Sqrt[c]*Log[x] + 11*a^3*Sqrt[c]*Log[c + Sqrt[c]*Sqrt[c + a^2*c*x^2]])/(6*c^
2)
```

fricas [A]   time = 0.63, size = 129, normalized size = 0.78

$$\frac{11\left(a^5x^5+a^3x^3\right)\sqrt{c}\log\left(-\frac{a^2cx^2+2\sqrt{a^2cx^2+c}\sqrt{c}+2c}{x^2}\right)+2\left(5a^3x^3-ax+2\left(8a^4x^4+4a^2x^2-1\right)\arctan(ax)\right)\sqrt{a^2cx^2+}}{12\left(a^2c^2x^5+c^2x^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] 1/12*(11*(a^5*x^5 + a^3*x^3)*sqrt(c)*log(-(a^2*c*x^2 + 2*sqrt(a^2*c*x^2 + c
)*sqrt(c) + 2*c)/x^2) + 2*(5*a^3*x^3 - a*x + 2*(8*a^4*x^4 + 4*a^2*x^2 - 1)*
arctan(a*x))*sqrt(a^2*c*x^2 + c))/(a^2*c^2*x^5 + c^2*x^3)
```

giac [F]   time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C]   time = 2.92, size = 259, normalized size = 1.57

$$\frac{a^3(i+\arctan(ax))(ax-i)\sqrt{c(ax-i)(ax+i)}}{2\left(a^2x^2+1\right)c^2}+\frac{\sqrt{c(ax-i)(ax+i)}\ (ax+i)(\arctan(ax)-i)a^3}{2\left(a^2x^2+1\right)c^2}+\frac{(10\arctan(ax)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^4/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*a^3*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2+1
/2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)-I)*a^3/(a^2*x^2+1)/c^2+1/
6*(10*arctan(a*x)*x^2*a^2-a*x-2*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)/x^3/
c^2-11/6*a^3*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)/(a^2*x^2+1)^(1/2)*(c*(a*x-I)
*(I+a*x))^(1/2)/c^2+11/6*a^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^
(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2
```

maxima [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^4/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^(3/2)*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)}{x^4\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^4*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(atan(a*x)/(x^4*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}{\left(ax \right)}}{x^{4} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**4/(a**2*c*x**2+c)**(3/2),x)
[Out] Integral(atan(a*x)/(x**4*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.240 $\int \frac{x^5 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=170

$$-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{a^6c^{5/2}}+\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{a^6c^3}+\frac{5\tan^{-1}(ax)}{3a^6c^2\sqrt{a^2cx^2+c}}-\frac{5x}{3a^5c^2\sqrt{a^2cx^2+c}}+\frac{x^2\tan^{-1}(ax)}{3a^4c\left(a^2cx^2+c\right)^{3/2}}-\frac{}{9a^3c\left(a^2\right.}$$

```
[Out] -1/9*x^3/a^3/c/(a^2*c*x^2+c)^(3/2)+1/3*x^2*arctan(a*x)/a^4/c/(a^2*c*x^2+c)^
(3/2)-arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^6/c^(5/2)-5/3*x/a^5/c^2/(a
^2*c*x^2+c)^(1/2)+5/3*arctan(a*x)/a^6/c^2/(a^2*c*x^2+c)^(1/2)+arctan(a*x)*(
a^2*c*x^2+c)^(1/2)/a^6/c^3
```

Rubi [A] time = 0.43, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4964, 4930, 217, 206, 191, 4938}

$$-\frac{5x}{3a^5c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{a^6c^3}+\frac{5\tan^{-1}(ax)}{3a^6c^2\sqrt{a^2cx^2+c}}-\frac{\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{a^6c^{5/2}}-\frac{x^3}{9a^3c\left(a^2cx^2+c\right)^{3/2}}+\frac{x^2\,\mathrm{ta}}{3a^4c\left(a^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -x^3/(9*a^3*c*(c + a^2*c*x^2)^(3/2)) - (5*x)/(3*a^5*c^2*Sqrt[c + a^2*c*x^2]
) + (x^2*ArcTan[a*x])/(3*a^4*c*(c + a^2*c*x^2)^(3/2)) + (5*ArcTan[a*x])/(3*
a^6*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(a^6*c^3)
- ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]]/(a^6*c^(5/2))
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4938

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(q_), x_Symbol] :> Simp[(b*(f*x)^m*(d + e*x^2)^(q + 1))/(c*d*m^2), x] +
```

```
(Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x)^(m - 2)*(d + e*x^2)^(q + 1)*(a +
b*ArcTan[c*x]), x], x] - Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*A
rcTan[c*x]))/(c^2*d*m), x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d
] && EqQ[m + 2*q + 2, 0] && LtQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^5\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\int \frac{x^3\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a^2}+\frac{\int \frac{x^3\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2c}$$

$$= -\frac{x^3}{9a^3c\left(c+a^2cx^2\right)^{3/2}}+\frac{x^2\tan^{-1}(ax)}{3a^4c\left(c+a^2cx^2\right)^{3/2}}+\frac{\int \frac{x\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{a^4c^2}-\frac{2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3a^4c}-\frac{\int \frac{x}{(c\cdots}}{}$$

$$= -\frac{x^3}{9a^3c\left(c+a^2cx^2\right)^{3/2}}+\frac{x^2\tan^{-1}(ax)}{3a^4c\left(c+a^2cx^2\right)^{3/2}}+\frac{5\tan^{-1}(ax)}{3a^6c^2\sqrt{c+a^2cx^2}}+\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax\cdots}{a^6c^3}$$

$$= -\frac{x^3}{9a^3c\left(c+a^2cx^2\right)^{3/2}}-\frac{5x}{3a^5c^2\sqrt{c+a^2cx^2}}+\frac{x^2\tan^{-1}(ax)}{3a^4c\left(c+a^2cx^2\right)^{3/2}}+\frac{5\tan^{-1}(ax)}{3a^6c^2\sqrt{c+a^2cx^2}}+\cdots$$

$$= -\frac{x^3}{9a^3c\left(c+a^2cx^2\right)^{3/2}}-\frac{5x}{3a^5c^2\sqrt{c+a^2cx^2}}+\frac{x^2\tan^{-1}(ax)}{3a^4c\left(c+a^2cx^2\right)^{3/2}}+\frac{5\tan^{-1}(ax)}{3a^6c^2\sqrt{c+a^2cx^2}}+\cdots$$

Mathematica [A] time = 0.21, size = 131, normalized size = 0.77

$$-\frac{ax\left(16a^2x^2+15\right)\sqrt{a^2cx^2+c}+9\sqrt{c}\left(a^2x^2+1\right)^2\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+acx\right)-3\left(3a^4x^4+12a^2x^2+8\right)\sqrt{a^2cx\cdots}}{9a^6c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -1/9*(a*x*(15 + 16*a^2*x^2)*Sqrt[c + a^2*c*x^2] - 3*Sqrt[c + a^2*c*x^2]*(8
+ 12*a^2*x^2 + 3*a^4*x^4)*ArcTan[a*x] + 9*Sqrt[c]*(1 + a^2*x^2)^2*Log[a*c*x
 + Sqrt[c]*Sqrt[c + a^2*c*x^2]])/(a^6*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.53, size = 140, normalized size = 0.82

$$\frac{9\left(a^4x^4+2a^2x^2+1\right)\sqrt{c}\log\left(-2a^2cx^2+2\sqrt{a^2cx^2+c}\,a\sqrt{c}\,x-c\right)-2\left(16a^3x^3+15ax-3\left(3a^4x^4+12a^2x^2+\cdots\right.\right.}{18\left(a^{10}c^3x^4+2a^8c^3x^2+a^6c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/18*(9*(a^4*x^4 + 2*a^2*x^2 + 1)*sqrt(c)*log(-2*a^2*c*x^2 + 2*sqrt(a^2*c*x
^2 + c)*a*sqrt(c)*x - c) - 2*(16*a^3*x^3 + 15*a*x - 3*(3*a^4*x^4 + 12*a^2*x
^2 + 8)*arctan(a*x))*sqrt(a^2*c*x^2 + c))/(a^10*c^3*x^4 + 2*a^8*c^3*x^2 + a
^6*c^3)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 5.82, size = 386, normalized size = 2.27

$$\frac{(i+3\arctan(ax))\left(ix^3a^3+3a^2x^2-3iax-1\right)\sqrt{c\,(ax-i)\,(ax+i)}}{72\left(a^2x^2+1\right)^2c^3a^6}+\frac{7\,(i+\arctan(ax))\,(iax+1)\sqrt{c\,(ax-i)\,(ax+i}}{8a^6c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/72*(I+3*arctan(a*x))*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))^
(1/2)/(a^2*x^2+1)^2/c^3/a^6+7/8*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x
))^(1/2)/a^6/c^3/(a^2*x^2+1)-7/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arct
an(a*x)-I)/a^6/c^3/(a^2*x^2+1)-1/72*(c*(a*x-I)*(I+a*x))^(1/2)*(I*x^3*a^3-3*
a^2*x^2-3*I*a*x+1)*(-I+3*arctan(a*x))/a^6/c^3/(a^4*x^4+2*a^2*x^2+1)+arctan(
a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^6-ln((1+I*a*x)/(a^2*x^2+1)^(1/2)+I)/(a
^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^6/c^3+ln((1+I*a*x)/(a^2*x^2+1)^
(1/2)-I)/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^6/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5\arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^5*arctan(a*x)/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5\,\mathrm{atan}\left(a\,x\right)}{{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*atan(a*x))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^5*atan(a*x))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5 \operatorname{atan}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*atan(a*x)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**5*atan(a*x)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.241 $\int \frac{x^4 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}} \, dx$

Optimal. Leaf size=308

$$-\frac{x^3 \tan^{-1}(ax)}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{4}{3a^5c^2\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}}{a^5c^2\sqrt{}}$$

```
[Out] 1/9/a^5/c/(a^2*c*x^2+c)^(3/2)-1/3*x^3*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(3/2)
-4/3/a^5/c^2/(a^2*c*x^2+c)^(1/2)-x*arctan(a*x)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-
2*I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a
^5/c^2/(a^2*c*x^2+c)^(1/2)+I*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*
(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)-I*polylog(2,I*(1+I*a*x)^(1/2)
/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.37, antiderivative size = 308, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4964, 4934, 4890, 4886, 4944, 266, 43}

$$\frac{i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{4}{3a^5c^2\sqrt{a^2cx^2+c}}-\frac{x\tan^{-1}(ax)}{a^4c^2\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] 1/(9*a^5*c*(c + a^2*c*x^2)^(3/2)) - 4/(3*a^5*c^2*Sqrt[c + a^2*c*x^2]) - (x^
3*ArcTan[a*x])/(3*a^2*c*(c + a^2*c*x^2)^(3/2)) - (x*ArcTan[a*x])/(a^4*c^2*S
qrt[c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 +
I*a*x]/Sqrt[1 - I*a*x]])/(a^5*c^2*Sqrt[c + a^2*c*x^2]) + (I*Sqrt[1 + a^2*x^
2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^5*c^2*Sqrt[c + a^
2*c*x^2]) - (I*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*
a*x]])/(a^5*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4934

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^2*((d_) + (e_.)*(x_)^2)^(q_), x
_Symbol] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c^3*d*(q + 1)^2), x] + (-Dist[
1/(2*c^2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] +
Simp[(x*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*c^2*d*(q + 1)), x]) /;
FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -5/2]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\int \frac{x^2\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a^2} + \frac{\int \frac{x^2\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2c}$$

$$= -\frac{1}{a^5c^2\sqrt{c+a^2cx^2}} - \frac{x^3\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{x\tan^{-1}(ax)}{a^4c^2\sqrt{c+a^2cx^2}} + \frac{\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{3a} + \frac{\int \frac{\tan^{-1}}{\sqrt{c+a}}}{a^4}$$

$$= -\frac{1}{a^5c^2\sqrt{c+a^2cx^2}} - \frac{x^3\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{x\tan^{-1}(ax)}{a^4c^2\sqrt{c+a^2cx^2}} + \frac{\text{Subst}\left(\int \frac{x}{\left(c+a^2cx\right)^{5/2}}\,dx, x, \right.}{6a}$$

$$= -\frac{1}{a^5c^2\sqrt{c+a^2cx^2}} - \frac{x^3\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{x\tan^{-1}(ax)}{a^4c^2\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan}{a^5c^2\sqrt{c+a^2cx}}$$

$$= \frac{1}{9a^5c\left(c+a^2cx^2\right)^{3/2}} - \frac{4}{3a^5c^2\sqrt{c+a^2cx^2}} - \frac{x^3\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{x\tan^{-1}(ax)}{a^4c^2\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{}}{}$$

Mathematica [A] time = 0.40, size = 177, normalized size = 0.57

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{45}{\sqrt{a^2x^2+1}} - \frac{45ax\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} + 36i\left(\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) - \text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)\right) + 36\tan^{-1}(ax)\left(\log\left(1-i\right.\right.\right.}{36a^5c^3\sqrt{a^2x^2+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(-45/Sqrt[1 + a^2*x^2] - (45*a*x*ArcTan[a*x])/Sqrt[1
 + a^2*x^2] + Cos[3*ArcTan[a*x]] + 36*ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*
x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + (36*I)*(PolyLog[2, (-I)*E^(I*ArcTan[
a*x])] - PolyLog[2, I*E^(I*ArcTan[a*x])]) + 3*ArcTan[a*x]*Sin[3*ArcTan[a*x]
]))/(36*a^5*c^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^4\arctan(ax)}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^4*arctan(a*x)/(a^6*c^3*x^6 + 3*a^4*c^3*x^4 +
 3*a^2*c^3*x^2 + c^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.24, size = 389, normalized size = 1.26

$$-\frac{(i+3\arctan(ax))\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c\,(ax-i)\,(ax+i)}}{72\left(a^2x^2+1\right)^2c^3a^5}-\frac{5\,(i+\arctan(ax))\,(ax-i)\sqrt{c\,(ax-i)\,(ax+i)}}{8a^5c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/72*(I+3*arctan(a*x))*(a^3*x^3-3*I*x^2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^(
1/2)/(a^2*x^2+1)^2/c^3/a^5-5/8*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^
(1/2)/a^5/c^3/(a^2*x^2+1)-5/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x
)-I)/a^5/c^3/(a^2*x^2+1)-1/72*(-I+3*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)*
(a^3*x^3+3*I*x^2*a^2-3*a*x-I)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^5+I*(I*arctan(a*x
)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x
^2+1)^(1/2))+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-I*(1+I*a*x)/(a^
2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^5/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^4\arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4*arctan(a*x)/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4 \operatorname{atan}(a\,x)}{\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^4*atan(a*x))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4 \operatorname{atan}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**4*atan(a*x)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.242 $\int \frac{x^3 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}} \, dx$

Optimal. Leaf size=112

$$-\frac{x^2 \tan^{-1}(ax)}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3}{9ac\left(a^2cx^2+c\right)^{3/2}}-\frac{2\tan^{-1}(ax)}{3a^4c^2\sqrt{a^2cx^2+c}}+\frac{2x}{3a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/9*x^3/a/c/(a^2*c*x^2+c)^(3/2)-1/3*x^2*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(3/
2)+2/3*x/a^3/c^2/(a^2*c*x^2+c)^(1/2)-2/3*arctan(a*x)/a^4/c^2/(a^2*c*x^2+c)^
(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 112, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4938, 4930, 191}

$$\frac{2x}{3a^3c^2\sqrt{a^2cx^2+c}}-\frac{2\tan^{-1}(ax)}{3a^4c^2\sqrt{a^2cx^2+c}}+\frac{x^3}{9ac\left(a^2cx^2+c\right)^{3/2}}-\frac{x^2\tan^{-1}(ax)}{3a^2c\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] x^3/(9*a*c*(c + a^2*c*x^2)^(3/2)) + (2*x)/(3*a^3*c^2*Sqrt[c + a^2*c*x^2]) -
 (x^2*ArcTan[a*x])/(3*a^2*c*(c + a^2*c*x^2)^(3/2)) - (2*ArcTan[a*x])/(3*a^4
*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4938

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(q_), x_Symbol] :> Simp[(b*(f*x)^m*(d + e*x^2)^(q + 1))/(c*d*m^2), x] +
 (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x)^(m - 2)*(d + e*x^2)^(q + 1)*(a +
b*ArcTan[c*x]), x], x] - Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*A
rcTan[c*x]))/(c^2*d*m), x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d
] && EqQ[m + 2*q + 2, 0] && LtQ[q, -1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3}{9ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3a^2c}$$

$$= \frac{x^3}{9ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)}{3a^4c^2\sqrt{c+a^2cx^2}} + \frac{2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3a^3c}$$

$$= \frac{x^3}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{2x}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)}{3a^4c^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.08, size = 65, normalized size = 0.58

$$\frac{\sqrt{a^2cx^2+c}\left(ax\left(7a^2x^2+6\right)-3\left(3a^2x^2+2\right)\tan^{-1}(ax)\right)}{9a^4c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(a*x*(6 + 7*a^2*x^2) - 3*(2 + 3*a^2*x^2)*ArcTan[a*x]))
/(9*a^4*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.79, size = 74, normalized size = 0.66

$$\frac{\left(7\,a^3x^3+6\,ax-3\left(3\,a^2x^2+2\right)\arctan\left(ax\right)\right)\sqrt{a^2cx^2+c}}{9\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/9*(7*a^3*x^3 + 6*a*x - 3*(3*a^2*x^2 + 2)*arctan(a*x))*sqrt(a^2*c*x^2 + c)
/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 3.06, size = 244, normalized size = 2.18

$$-\frac{\left(i+3\arctan\left(ax\right)\right)\left(ix^3a^3+3a^2x^2-3iax-1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{72\left(a^2x^2+1\right)^2c^3a^4}-\frac{3\left(i+\arctan\left(ax\right)\right)\left(iax+1\right)\sqrt{c\left(ax-i\right)\left(ax\right.}}{8a^4c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/72*(I+3*arctan(a*x))*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))
^(1/2)/(a^2*x^2+1)^2/c^3/a^4-3/8*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*
x))^(1/2)/a^4/c^3/(a^2*x^2+1)+3/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arc
tan(a*x)-I)/a^4/c^3/(a^2*x^2+1)+1/72*(-I+3*arctan(a*x))*(c*(a*x-I)*(I+a*x))
^(1/2)*(I*x^3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^4
```

maxima [A] time = 0.46, size = 65, normalized size = 0.58

$$\frac{7\,a^3x^3+6\,ax-3\left(3\,a^2x^2+2\right)\arctan\left(ax\right)}{9\left(a^6c^2x^2+a^4c^2\right)\sqrt{a^2x^2+1}\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/9*(7*a^3*x^3 + 6*a*x - 3*(3*a^2*x^2 + 2)*arctan(a*x))/((a^6*c^2*x^2 + a^4
*c^2)*sqrt(a^2*x^2 + 1)*sqrt(c))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\mathrm{atan}\left(a\,x\right)}{{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^3*atan(a*x))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Exception raised: TypeError
```

3.243 $\int \frac{x^2 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=77

$$\frac{x^3 \tan^{-1}(ax)}{3c\left(a^2cx^2+c\right)^{3/2}}+\frac{1}{3a^3c^2\sqrt{a^2cx^2+c}}-\frac{1}{9a^3c\left(a^2cx^2+c\right)^{3/2}}$$

```
[Out] -1/9/a^3/c/(a^2*c*x^2+c)^(3/2)+1/3*x^3*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)+1/
3/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4944, 266, 43}

$$\frac{1}{3a^3c^2\sqrt{a^2cx^2+c}}-\frac{1}{9a^3c\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3 \tan^{-1}(ax)}{3c\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -1/(9*a^3*c*(c + a^2*c*x^2)^(3/2)) + 1/(3*a^3*c^2*Sqrt[c + a^2*c*x^2]) + (x
^3*ArcTan[a*x])/(3*c*(c + a^2*c*x^2)^(3/2))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x^2\tan^{-1}(ax)}{(c+a^2cx^2)^{5/2}}\,dx &= \frac{x^3\tan^{-1}(ax)}{3c(c+a^2cx^2)^{3/2}} - \frac{1}{3}a\int \frac{x^3}{(c+a^2cx^2)^{5/2}}\,dx \\ &= \frac{x^3\tan^{-1}(ax)}{3c(c+a^2cx^2)^{3/2}} - \frac{1}{6}a\,\text{Subst}\left(\int \frac{x}{(c+a^2cx)^{5/2}}\,dx, x, x^2\right) \\ &= \frac{x^3\tan^{-1}(ax)}{3c(c+a^2cx^2)^{3/2}} - \frac{1}{6}a\,\text{Subst}\left(\int \left(-\frac{1}{a^2(c+a^2cx)^{5/2}} + \frac{1}{a^2c(c+a^2cx)^{3/2}}\right)dx, x, x^2\right) \\ &= -\frac{1}{9a^3c(c+a^2cx^2)^{3/2}} + \frac{1}{3a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3\tan^{-1}(ax)}{3c(c+a^2cx^2)^{3/2}}\end{aligned}$$

Mathematica [A] time = 0.06, size = 57, normalized size = 0.74

$$\frac{\sqrt{a^2cx^2+c}\,\left(3a^3x^3\tan^{-1}(ax)+3a^2x^2+2\right)}{9a^3c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(2 + 3*a^2*x^2 + 3*a^3*x^3*ArcTan[a*x]))/(9*a^3*c^3*(1
 + a^2*x^2)^2)
```

fricas [A] time = 0.57, size = 67, normalized size = 0.87

$$\frac{\left(3\,a^3x^3\arctan(ax)+3\,a^2x^2+2\right)\sqrt{a^2cx^2+c}}{9\left(a^7c^3x^4+2\,a^5c^3x^2+a^3c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/9*(3*a^3*x^3*arctan(a*x) + 3*a^2*x^2 + 2)*sqrt(a^2*c*x^2 + c)/(a^7*c^3*x^
4 + 2*a^5*c^3*x^2 + a^3*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 2.83, size = 240, normalized size = 3.12

$$\frac{(i+3\arctan(ax))\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c(ax-i)(ax+i)}}{72\left(a^2x^2+1\right)^2c^3a^3}+\frac{(i+\arctan(ax))(ax-i)\sqrt{c(ax-i)(ax+i)}}{8a^3c^3\left(a^2x^2+1\right)}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/72*(I+3*arctan(a*x))*(a^3*x^3-3*I*x^2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^(1
/2)/(a^2*x^2+1)^2/c^3/a^3+1/8*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(
1/2)/a^3/c^3/(a^2*x^2+1)+1/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)
-I)/a^3/c^3/(a^2*x^2+1)+1/72*(-I+3*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)*(
a^3*x^3+3*I*x^2*a^2-3*a*x-I)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^3
```

maxima [A] time = 0.36, size = 93, normalized size = 1.21

$$\frac{1}{9}a\left(\frac{3}{\sqrt{a^2cx^2+c}\,a^4c^2}-\frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}a^4c}\right)+\frac{1}{3}\left(\frac{x}{\sqrt{a^2cx^2+c}\,a^2c^2}-\frac{x}{\left(a^2cx^2+c\right)^{\frac{3}{2}}a^2c}\right)\arctan\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/9*a*(3/(sqrt(a^2*c*x^2 + c)*a^4*c^2) - 1/((a^2*c*x^2 + c)^(3/2)*a^4*c)) +
 1/3*(x/(sqrt(a^2*c*x^2 + c)*a^2*c^2) - x/((a^2*c*x^2 + c)^(3/2)*a^2*c))*ar
ctan(a*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^2*atan(a*x))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\operatorname{atan}{\left(ax \right)}}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**2*atan(a*x)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.244 $\int \frac{x\tan^{-1}(ax)}{(c+a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=79

$$\frac{2x}{9ac^2\sqrt{a^2cx^2+c}}+\frac{x}{9ac\left(a^2cx^2+c\right)^{3/2}}-\frac{\tan^{-1}(ax)}{3a^2c\left(a^2cx^2+c\right)^{3/2}}$$

```
[Out] 1/9*x/a/c/(a^2*c*x^2+c)^(3/2)-1/3*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(3/2)+2/9
*x/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.06, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4930, 192, 191}

$$\frac{2x}{9ac^2\sqrt{a^2cx^2+c}}+\frac{x}{9ac\left(a^2cx^2+c\right)^{3/2}}-\frac{\tan^{-1}(ax)}{3a^2c\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] x/(9*a*c*(c + a^2*c*x^2)^(3/2)) + (2*x)/(9*a*c^2*Sqrt[c + a^2*c*x^2]) - Arc
Tan[a*x]/(3*a^2*c*(c + a^2*c*x^2)^(3/2))
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx &= -\frac{\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{3a}\\
&= \frac{x}{9ac\left(c+a^2cx^2\right)^{3/2}}-\frac{\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{9ac}\\
&= \frac{x}{9ac\left(c+a^2cx^2\right)^{3/2}}+\frac{2x}{9ac^2\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)}{3a^2c\left(c+a^2cx^2\right)^{3/2}}
\end{aligned}$$

Mathematica [A] time = 0.06, size = 51, normalized size = 0.65

$$\frac{\sqrt{a^2cx^2+c}\left(2a^3x^3+3ax-3\tan^{-1}(ax)\right)}{9c^3\left(a^3x^2+a\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(3*a*x + 2*a^3*x^3 - 3*ArcTan[a*x]))/(9*c^3*(a + a^3*x
^2)^2)
```

fricas [A] time = 0.51, size = 64, normalized size = 0.81

$$\frac{\left(2\,a^3x^3+3\,ax-3\,\arctan\left(ax\right)\right)\sqrt{a^2cx^2+c}}{9\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/9*(2*a^3*x^3 + 3*a*x - 3*arctan(a*x))*sqrt(a^2*c*x^2 + c)/(a^6*c^3*x^4 +
2*a^4*c^3*x^2 + a^2*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.90, size = 244, normalized size = 3.09

$$\frac{\left(i+3\arctan\left(ax\right)\right)\left(ix^3a^3+3a^2x^2-3iax-1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{72\left(a^2x^2+1\right)^2c^3a^2}-\frac{\left(i+\arctan\left(ax\right)\right)\left(iax+1\right)\sqrt{c\left(ax-i\right)\left(ax+\right.}}{8a^2c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/72*(I+3*arctan(a*x))*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))^
(1/2)/(a^2*x^2+1)^2/c^3/a^2-1/8*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x
))^(1/2)/a^2/c^3/(a^2*x^2+1)+1/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arct
an(a*x)-I)/a^2/c^3/(a^2*x^2+1)-1/72*(c*(a*x-I)*(I+a*x))^(1/2)*(I*x^3*a^3-3*
a^2*x^2-3*I*a*x+1)*(-I+3*arctan(a*x))/a^2/c^3/(a^4*x^4+2*a^2*x^2+1)
```

maxima [A] time = 0.44, size = 66, normalized size = 0.84

$$\frac{\left(2\,a^3x^3+3\,ax-3\,\arctan\left(ax\right)\right)\sqrt{a^2x^2+1}\,\sqrt{c}}{9\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/9*(2*a^3*x^3 + 3*a*x - 3*arctan(a*x))*sqrt(a^2*x^2 + 1)*sqrt(c)/(a^6*c^3*
x^4 + 2*a^4*c^3*x^2 + a^2*c^3)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x \operatorname{atan}(a x)}{\left(c a^2 x^2 + c\right)^{5/2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x))/(c + a^2*c*x^2)^(5/2),x)
[Out] int((x*atan(a*x))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)/(a**2*c*x**2+c)**(5/2),x)
[Out] Exception raised: TypeError
```

3.245 $\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=101

$$\frac{2}{3ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)}{3c^2\sqrt{a^2cx^2+c}}+\frac{1}{9ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax)}{3c\left(a^2cx^2+c\right)^{3/2}}$$

```
[Out] 1/9/a/c/(a^2*c*x^2+c)^(3/2)+1/3*x*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)+2/3/a/c
^2/(a^2*c*x^2+c)^(1/2)+2/3*x*arctan(a*x)/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.105, Rules used = {4896, 4894}

$$\frac{2}{3ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)}{3c^2\sqrt{a^2cx^2+c}}+\frac{1}{9ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax)}{3c\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] 1/(9*a*c*(c + a^2*c*x^2)^(3/2)) + 2/(3*a*c^2*Sqrt[c + a^2*c*x^2]) + (x*ArcT
an[a*x])/(3*c*(c + a^2*c*x^2)^(3/2)) + (2*x*ArcTan[a*x])/(3*c^2*Sqrt[c + a^
2*c*x^2])
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx &= \frac{1}{9ac\left(c+a^2cx^2\right)^{3/2}}+\frac{x\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}}+\frac{2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3c}\\ &= \frac{1}{9ac\left(c+a^2cx^2\right)^{3/2}}+\frac{2}{3ac^2\sqrt{c+a^2cx^2}}+\frac{x\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}}+\frac{2x\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.05, size = 63, normalized size = 0.62

$$\frac{\sqrt{a^2cx^2+c}\left(\left(6a^3x^3+9ax\right)\tan^{-1}(ax)+6a^2x^2+7\right)}{9ac^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(7 + 6*a^2*x^2 + (9*a*x + 6*a^3*x^3)*ArcTan[a*x]))/(9*
a*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.74, size = 72, normalized size = 0.71

$$\frac{\sqrt{a^2cx^2+c}\left(6\,a^2x^2+3\left(2\,a^3x^3+3\,ax\right)\arctan\left(ax\right)+7\right)}{9\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/9*sqrt(a^2*c*x^2 + c)*(6*a^2*x^2 + 3*(2*a^3*x^3 + 3*a*x)*arctan(a*x) + 7)
/(a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.50, size = 240, normalized size = 2.38

$$-\frac{\left(i+3\arctan\left(ax\right)\right)\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{72\left(a^2x^2+1\right)^2a\,c^3}+\frac{3\left(i+\arctan\left(ax\right)\right)\left(ax-i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{8c^3a\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/72*(I+3*arctan(a*x))*(a^3*x^3-3*I*x^2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^(
1/2)/(a^2*x^2+1)^2/a/c^3+3/8*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1
/2)/c^3/a/(a^2*x^2+1)+3/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)-I)
/c^3/a/(a^2*x^2+1)-1/72*(-I+3*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)*(a^3*x
^3+3*I*x^2*a^2-3*a*x-I)/(a^4*x^4+2*a^2*x^2+1)/a/c^3
```

maxima [A] time = 0.34, size = 86, normalized size = 0.85

$$\frac{1}{9}a\left(\frac{6}{\sqrt{a^2cx^2+c}\,a^2c^2}+\frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}a^2c}\right)+\frac{1}{3}\left(\frac{2\,x}{\sqrt{a^2cx^2+c}\,c^2}+\frac{x}{\left(a^2cx^2+c\right)^{\frac{3}{2}}c}\right)\arctan\left(ax\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/9*a*(6/(sqrt(a^2*c*x^2 + c)*a^2*c^2) + 1/((a^2*c*x^2 + c)^(3/2)*a^2*c)) +
 1/3*(2*x/(sqrt(a^2*c*x^2 + c)*c^2) + x/((a^2*c*x^2 + c)^(3/2)*c))*arctan(a
*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)}{{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + a^2*c*x^2)^(5/2),x)
[Out] int(atan(a*x)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(a**2*c*x**2+c)**(5/2),x)
[Out] Integral(atan(a*x)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.246 $\int \frac{\tan^{-1}(ax)}{x(c+a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=279

$$\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{11ax}{9c^2\sqrt{a^2cx^2+c}}+\frac{\tan^{-1}(ax)}{c^2\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tanh}{c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -1/9*a*x/c/(a^2*c*x^2+c)^(3/2)+1/3*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)-11/9*a
*x/c^2/(a^2*c*x^2+c)^(1/2)+arctan(a*x)/c^2/(a^2*c*x^2+c)^(1/2)-2*arctan(a*x
)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2
+c)^(1/2)+I*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c
^2/(a^2*c*x^2+c)^(1/2)-I*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^
2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.43, antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4966, 4958, 4954, 4930, 191, 192}

$$\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{11ax}{9c^2\sqrt{a^2cx^2+c}}+\frac{\tan^{-1}(ax)}{c^2\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] -(a*x)/(9*c*(c + a^2*c*x^2)^(3/2)) - (11*a*x)/(9*c^2*Sqrt[c + a^2*c*x^2]) +
 ArcTan[a*x]/(3*c*(c + a^2*c*x^2)^(3/2)) + ArcTan[a*x]/(c^2*Sqrt[c + a^2*c*
x^2]) - (2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I
*a*x]])/(c^2*Sqrt[c + a^2*c*x^2]) + (I*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[
1 + I*a*x]/Sqrt[1 - I*a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) - (I*Sqrt[1 + a^2*x
^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(c^2*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
```

```
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^{5/2}}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)}{x\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}}-\frac{1}{3}a\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}}\,dx+\frac{\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx}{c^2}-\frac{a^2\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= -\frac{ax}{9c\left(c+a^2cx^2\right)^{3/2}}+\frac{\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}}+\frac{\tan^{-1}(ax)}{c^2\sqrt{c+a^2cx^2}}-\frac{(2a)\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{9c}-\frac{a\int \cdots}{\cdots}$$

$$= -\frac{ax}{9c\left(c+a^2cx^2\right)^{3/2}}-\frac{11ax}{9c^2\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}}+\frac{\tan^{-1}(ax)}{c^2\sqrt{c+a^2cx^2}}-\frac{2\sqrt{1+a^2\cdots}}{\cdots}$$

Mathematica [A] time = 0.38, size = 168, normalized size = 0.60

$$\frac{\left(a^2x^2+1\right)^{3/2}\left(-\frac{45ax}{\sqrt{a^2x^2+1}}+\frac{45\tan^{-1}(ax)}{\sqrt{a^2x^2+1}}+36i\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-36i\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+36\tan^{-1}(ax)\log\left(1-e^{i\tan^{-1}\cdots}\right)\cdots\right.}{36c\left(c\left(a^2x^2+1\right)\right)^{3/\cdots}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] ((1 + a^2*x^2)^(3/2)*((-45*a*x)/Sqrt[1 + a^2*x^2] + (45*ArcTan[a*x])/Sqrt[1
 + a^2*x^2] + 3*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 36*ArcTan[a*x]*Log[1 - E^(
I*ArcTan[a*x])] - 36*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] + (36*I)*PolyLo
g[2, -E^(I*ArcTan[a*x])] - (36*I)*PolyLog[2, E^(I*ArcTan[a*x])] - Sin[3*Arc
Tan[a*x]]))/(36*c*(c*(1 + a^2*x^2))^(3/2))
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)}{a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)/(a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a
^2*c^3*x^3 + c^3*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.72, size = 370, normalized size = 1.33

$$-\frac{(i+3\arctan(ax))\left(ix^3a^3+3a^2x^2-3iax-1\right)\sqrt{c(ax-i)(ax+i)}}{72\left(a^2x^2+1\right)^2c^3}+\frac{5(i+\arctan(ax))(iax+1)\sqrt{c(ax-i)(ax+}}{8c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/72*(I+3*arctan(a*x))*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))
^(1/2)/(a^2*x^2+1)^2/c^3+5/8*(I+arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^
(1/2)/c^3/(a^2*x^2+1)-5/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)
-I)/c^3/(a^2*x^2+1)+1/72*(-I+3*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)*(I*x^
3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3-I*(-I*ln(1+(1+I*a*x)/(
a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*
x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*a*x)/(a^2*x^2+1)^
(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^(5/2)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}(a\,x)}{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(atan(a*x)/(x*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Exception raised: TypeError
```

3.247 $\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=158

$$-\frac{a\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{c^{5/2}}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{c^3x}-\frac{5a}{3c^2\sqrt{a^2cx^2+c}}-\frac{5a^2x\tan^{-1}(ax)}{3c^2\sqrt{a^2cx^2+c}}-\frac{a}{9c\left(a^2cx^2+c\right)^{3/2}}-\frac{a^2x\tan^{-1}}{3c\left(a^2cx^2\right.}$$

```
[Out] -1/9*a/c/(a^2*c*x^2+c)^(3/2)-1/3*a^2*x*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)-a*
arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(5/2)-5/3*a/c^2/(a^2*c*x^2+c)^(1/2)-
5/3*a^2*x*arctan(a*x)/c^2/(a^2*c*x^2+c)^(1/2)-arctan(a*x)*(a^2*c*x^2+c)^(1/
2)/c^3/x
```

Rubi [A] time = 0.34, antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4966, 4944, 266, 63, 208, 4894, 4896}

$$-\frac{5a}{3c^2\sqrt{a^2cx^2+c}}-\frac{5a^2x\tan^{-1}(ax)}{3c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{c^3x}-\frac{a\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{c^{5/2}}-\frac{a}{9c\left(a^2cx^2+c\right)^{3/2}}-\frac{a^2x\tan^{-1}}{3c\left(a^2cx^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] -a/(9*c*(c + a^2*c*x^2)^(3/2)) - (5*a)/(3*c^2*Sqrt[c + a^2*c*x^2]) - (a^2*x
*ArcTan[a*x])/(3*c*(c + a^2*c*x^2)^(3/2)) - (5*a^2*x*ArcTan[a*x])/(3*c^2*Sq
rt[c + a^2*c*x^2]) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(c^3*x) - (a*ArcTanh
[Sqrt[c + a^2*c*x^2]/Sqrt[c]])/c^(5/2)
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= -\frac{a}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{a^2x\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx}{c^2} - \frac{\left(2a^2\right)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3c} - \frac{a^2 \int}{}$$

$$= -\frac{a}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a}{3c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a^2x\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx}}{c}$$

$$= -\frac{a}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a}{3c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a^2x\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx}}{c}$$

$$= -\frac{a}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a}{3c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a^2x\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx}}{c}$$

$$= -\frac{a}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a}{3c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a^2x\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx}}{c}$$

Mathematica [A] time = 0.25, size = 151, normalized size = 0.96

$$\frac{ax\left(-\left(15a^2x^2+16\right)\sqrt{a^2cx^2+c}+9\sqrt{c}\left(a^2x^2+1\right)^2\log(x)-9\sqrt{c}\left(a^2x^2+1\right)^2\log\left(\sqrt{c}\sqrt{a^2cx^2+c}+c\right)\right)-3\left(8a^4x\right.}{9c^3x\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(x^2*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] (-3*Sqrt[c + a^2*c*x^2]*(3 + 12*a^2*x^2 + 8*a^4*x^4)*ArcTan[a*x] + a*x*(-((
16 + 15*a^2*x^2)*Sqrt[c + a^2*c*x^2]) + 9*Sqrt[c]*(1 + a^2*x^2)^2*Log[x] -
9*Sqrt[c]*(1 + a^2*x^2)^2*Log[c + Sqrt[c]*Sqrt[c + a^2*c*x^2]]))/(9*c^3*x*(
1 + a^2*x^2)^2)
```

fricas [A] time = 0.59, size = 142, normalized size = 0.90

$$\frac{9\left(a^5x^5+2\,a^3x^3+ax\right)\sqrt{c}\,\log\left(-\frac{a^2cx^2-2\,\sqrt{a^2cx^2+c}\,\sqrt{c}+2\,c}{x^2}\right)-2\left(15\,a^3x^3+16\,ax+3\left(8\,a^4x^4+12\,a^2x^2+3\right)\arctan(\right.}{18\left(a^4c^3x^5+2\,a^2c^3x^3+c^3x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/18*(9*(a^5*x^5 + 2*a^3*x^3 + a*x)*sqrt(c)*log(-(a^2*c*x^2 - 2*sqrt(a^2*c*
x^2 + c)*sqrt(c) + 2*c)/x^2) - 2*(15*a^3*x^3 + 16*a*x + 3*(8*a^4*x^4 + 12*a
^2*x^2 + 3)*arctan(a*x))*sqrt(a^2*c*x^2 + c))/(a^4*c^3*x^5 + 2*a^2*c^3*x^3
+ c^3*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.66, size = 369, normalized size = 2.34

$$\frac{a\left(i+3\arctan\left(ax\right)\right)\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{72\left(a^2x^2+1\right)^2c^3}-\frac{7a\left(i+\arctan\left(ax\right)\right)\left(ax-i\right)\sqrt{c\left(ax-i\right)\left(ax\right.}}{8c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/x^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/72*a*(I+3*arctan(a*x))*(a^3*x^3-3*I*x^2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^
(1/2)/(a^2*x^2+1)^2/c^3-7/8*a*(I+arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(
1/2)/c^3/(a^2*x^2+1)-7/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)-I)*
a/c^3/(a^2*x^2+1)+1/72*(c*(a*x-I)*(I+a*x))^(1/2)*(a^3*x^3+3*I*x^2*a^2-3*a*x
-I)*(-I+3*arctan(a*x))*a/c^3/(a^4*x^4+2*a^2*x^2+1)-arctan(a*x)*(c*(a*x-I)*(
I+a*x))^(1/2)/x/c^3-a*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)*(
c*(a*x-I)*(I+a*x))^(1/2)/c^3+a*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)/(a^2*x^2+1
)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan\left(ax\right)}{\left(a^2cx^2+c\right)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)/((a^2*c*x^2 + c)^(5/2)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}(a\,x)}{x^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(atan(a*x)/(x^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}(ax)}{x^2\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/x**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)/(x**2*(c*(a**2*x**2 + 1))**(5/2)), x)
```

3.248 $\int x^m \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)\,dx$

Optimal. Leaf size=270

$$\frac{a^6c^3x^{m+7}\tan^{-1}(ax)}{m+7}+\frac{3a^4c^3x^{m+5}\tan^{-1}(ax)}{m+5}-\frac{ac^3x^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}+\frac{3a^2c^3x^{m+3}\tan^{-1}(ax)}{m+3}-\frac{a^7c^3x^{m+}}{}$$

```
[Out] c^3*x^(1+m)*arctan(a*x)/(1+m)+3*a^2*c^3*x^(3+m)*arctan(a*x)/(3+m)+3*a^4*c^3
*x^(5+m)*arctan(a*x)/(5+m)+a^6*c^3*x^(7+m)*arctan(a*x)/(7+m)-a*c^3*x^(2+m)*
hypergeom([1, 1+1/2*m],[2+1/2*m],-a^2*x^2)/(m^2+3*m+2)-3*a^3*c^3*x^(4+m)*hy
pergeom([1, 2+1/2*m],[3+1/2*m],-a^2*x^2)/(m^2+7*m+12)-3*a^5*c^3*x^(6+m)*hyp
ergeom([1, 3+1/2*m],[4+1/2*m],-a^2*x^2)/(5+m)/(6+m)-a^7*c^3*x^(8+m)*hyperge
om([1, 4+1/2*m],[5+1/2*m],-a^2*x^2)/(7+m)/(8+m)
```

Rubi [A] time = 0.23, antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4948, 4852, 364}

$$-\frac{ac^3x^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}-\frac{3a^3c^3x^{m+4}\,{}_2F_1\left(1,\frac{m+4}{2};\frac{m+6}{2};-a^2x^2\right)}{m^2+7m+12}-\frac{3a^5c^3x^{m+6}\,{}_2F_1\left(1,\frac{m+6}{2};\frac{m+8}{2};-a^2x^2\right)}{(m+5)(m+6)}-$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] (c^3*x^(1 + m)*ArcTan[a*x])/(1 + m) + (3*a^2*c^3*x^(3 + m)*ArcTan[a*x])/(3
+ m) + (3*a^4*c^3*x^(5 + m)*ArcTan[a*x])/(5 + m) + (a^6*c^3*x^(7 + m)*ArcTa
n[a*x])/(7 + m) - (a*c^3*x^(2 + m)*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/
2, -(a^2*x^2)])/(2 + 3*m + m^2) - (3*a^3*c^3*x^(4 + m)*Hypergeometric2F1[1,
 (4 + m)/2, (6 + m)/2, -(a^2*x^2)])/(12 + 7*m + m^2) - (3*a^5*c^3*x^(6 + m)
*Hypergeometric2F1[1, (6 + m)/2, (8 + m)/2, -(a^2*x^2)])/((5 + m)*(6 + m))
- (a^7*c^3*x^(8 + m)*Hypergeometric2F1[1, (8 + m)/2, (10 + m)/2, -(a^2*x^2)
])/((7 + m)*(8 + m))
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)\,dx = \int \left(c^3x^m \tan^{-1}(ax) + 3a^2c^3x^{2+m}\tan^{-1}(ax) + 3a^4c^3x^{4+m}\tan^{-1}(ax) + a^6c^3x^{6+m}\,\mathrm{t}\right.$$
$$= c^3\int x^m \tan^{-1}(ax)\,dx + \left(3a^2c^3\right)\int x^{2+m}\tan^{-1}(ax)\,dx + \left(3a^4c^3\right)\int x^{4+m}\tan^{-1}($$
$$= \frac{c^3x^{1+m}\tan^{-1}(ax)}{1+m} + \frac{3a^2c^3x^{3+m}\tan^{-1}(ax)}{3+m} + \frac{3a^4c^3x^{5+m}\tan^{-1}(ax)}{5+m} + \frac{a^6c^3x^{7+m}\,\mathrm{t}}{7+}$$
$$= \frac{c^3x^{1+m}\tan^{-1}(ax)}{1+m} + \frac{3a^2c^3x^{3+m}\tan^{-1}(ax)}{3+m} + \frac{3a^4c^3x^{5+m}\tan^{-1}(ax)}{5+m} + \frac{a^6c^3x^{7+m}\,\mathrm{t}}{7+}$$

Mathematica [A] time = 0.36, size = 234, normalized size = 0.87

$$c^3x^{m+1}\left(\frac{a^6x^6\tan^{-1}(ax)}{m+7} + \frac{3a^4x^4\tan^{-1}(ax)}{m+5} - \frac{ax\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2} + \frac{3a^2x^2\tan^{-1}(ax)}{m+3} - \frac{a^7x^7\,{}_2F_1\left(1,\frac{m}{2}+4\right.}{(m+7)(}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x],x]
```

```
[Out] c^3*x^(1 + m)*(ArcTan[a*x]/(1 + m) + (3*a^2*x^2*ArcTan[a*x])/(3 + m) + (3*a
^4*x^4*ArcTan[a*x])/(5 + m) + (a^6*x^6*ArcTan[a*x])/(7 + m) - (a^7*x^7*Hype
rgeometric2F1[1, 4 + m/2, 5 + m/2, -(a^2*x^2)])/((7 + m)*(8 + m)) - (a*x*Hy
pergeometric2F1[1, (2 + m)/2, (4 + m)/2, -(a^2*x^2)])/(2 + 3*m + m^2) - (3*
a^3*x^3*Hypergeometric2F1[1, (4 + m)/2, (6 + m)/2, -(a^2*x^2)])/(12 + 7*m +
 m^2) - (3*a^5*x^5*Hypergeometric2F1[1, (6 + m)/2, (8 + m)/2, -(a^2*x^2)])/
((5 + m)*(6 + m)))
```

fricas [F] time = 1.29, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)x^m \arctan\left(ax\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m*arctan(a*x
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.62, size = 600, normalized size = 2.22

$$\frac{a^{-1-m}c^3\left(-\frac{4x^m a^m\left(a^6m^3x^6+6a^6m^2x^6+8m\,x^6a^6-a^4m^3x^4-8a^4m^2x^4-12m\,x^4a^4+a^2m^3x^2+10a^2m^2x^2+24m\,x^2a^2-m^3-12m^2-44m-48\right)}{(7+m)m(2+m)(4+m)(6+m)} + \frac{8x^{8+m}a^{8+m}}{(14+2}\right.}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3*arctan(a*x),x)
```

```
[Out] 1/4*a^(-1-m)*c^3*(-4*x^m*a^m*(a^6*m^3*x^6+6*a^6*m^2*x^6+8*a^6*m*x^6-a^4*m^3
*x^4-8*a^4*m^2*x^4-12*a^4*m*x^4+a^2*m^3*x^2+10*a^2*m^2*x^2+24*a^2*m*x^2-m^3
-12*m^2-44*m-48)/(7+m)/m/(2+m)/(4+m)/(6+m)+8*x^(8+m)*a^(8+m)/(14+2*m)/(a^2*
x^2)^(1/2)*arctan((a^2*x^2)^(1/2))+2/(8+m)*x^m*a^m*(-8-m)/(7+m)*LerchPhi(-a
^2*x^2,1,1/2*m))+3/4*a^(-1-m)*c^3*(-4*x^m*a^m*(a^4*m^2*x^4+2*a^4*m*x^4-a^2*
m^2*x^2-4*a^2*m*x^2+m^2+6*m+8)/(5+m)/m/(2+m)/(4+m)+8*x^(6+m)*a^(6+m)/(10+2*
m)/(a^2*x^2)^(1/2)*arctan((a^2*x^2)^(1/2))+2*x^m*a^m/(5+m)*LerchPhi(-a^2*x^
2,1,1/2*m))+3/4*a^(-1-m)*c^3*(-4*x^m*a^m*(a^2*m*x^2-m-2)/(3+m)/m/(2+m)+8*x^
(4+m)*a^(4+m)/(6+2*m)/(a^2*x^2)^(1/2)*arctan((a^2*x^2)^(1/2))+2/(4+m)*x^m*a
^m*(-4-m)/(3+m)*LerchPhi(-a^2*x^2,1,1/2*m))+1/4*a^(-1-m)*c^3*(4/(2+m)*x^m*a
^m*(-m-2)/(1+m)/m+8*x^(2+m)*a^(2+m)/(2+2*m)/(a^2*x^2)^(1/2)*arctan((a^2*x^2
)^(1/2))+2*x^m*a^m/(1+m)*LerchPhi(-a^2*x^2,1,1/2*m))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(\left(a^6c^3m^3 + 9\,a^6c^3m^2 + 23\,a^6c^3m + 15\,a^6c^3\right)x^7 + 3\left(a^4c^3m^3 + 11\,a^4c^3m^2 + 31\,a^4c^3m + 21\,a^4c^3\right)x^5 + 3\left(a^2c^3m^3 \cdots\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x),x, algorithm="maxima")
```

```
[Out] (((a^6*c^3*m^3 + 9*a^6*c^3*m^2 + 23*a^6*c^3*m + 15*a^6*c^3)*x^7 + 3*(a^4*c^
3*m^3 + 11*a^4*c^3*m^2 + 31*a^4*c^3*m + 21*a^4*c^3)*x^5 + 3*(a^2*c^3*m^3 +
13*a^2*c^3*m^2 + 47*a^2*c^3*m + 35*a^2*c^3)*x^3 + (c^3*m^3 + 15*c^3*m^2 + 7
1*c^3*m + 105*c^3)*x)*x^m*arctan(a*x) - (m^4 + 16*m^3 + 86*m^2 + 176*m + 10
5)*integrate(((a^7*c^3*m^3 + 9*a^7*c^3*m^2 + 23*a^7*c^3*m + 15*a^7*c^3)*x^7
 + 3*(a^5*c^3*m^3 + 11*a^5*c^3*m^2 + 31*a^5*c^3*m + 21*a^5*c^3)*x^5 + 3*(a^
3*c^3*m^3 + 13*a^3*c^3*m^2 + 47*a^3*c^3*m + 35*a^3*c^3)*x^3 + (a*c^3*m^3 +
15*a*c^3*m^2 + 71*a*c^3*m + 105*a*c^3)*x)*x^m/(m^4 + 16*m^3 + (a^2*m^4 + 16
*a^2*m^3 + 86*a^2*m^2 + 176*a^2*m + 105*a^2)*x^2 + 86*m^2 + 176*m + 105), x
))/(m^4 + 16*m^3 + 86*m^2 + 176*m + 105)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^m*atan(a*x)*(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int x^{m} \operatorname{atan}{\left(a x \right)}\, dx + \int 3 a^{2} x^{2} x^{m} \operatorname{atan}{\left(a x \right)}\, dx + \int 3 a^{4} x^{4} x^{m} \operatorname{atan}{\left(a x \right)}\, dx + \int a^{6} x^{6} x^{m} \operatorname{atan}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3*atan(a*x),x)
```

```
[Out] c**3*(Integral(x**m*atan(a*x), x) + Integral(3*a**2*x**2*x**m*atan(a*x), x)
 + Integral(3*a**4*x**4*x**m*atan(a*x), x) + Integral(a**6*x**6*x**m*atan(a
*x), x))
```

3.249 $\int x^m \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)\,dx$

Optimal. Leaf size=201

$$\frac{a^4c^2x^{m+5}\tan^{-1}(ax)}{m+5}-\frac{ac^2x^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}+\frac{2a^2c^2x^{m+3}\tan^{-1}(ax)}{m+3}-\frac{a^5c^2x^{m+6}\,{}_2F_1\left(1,\frac{m+6}{2};\frac{m+8}{2};-a^2x^2\right)}{(m+5)(m+6)}$$

```
[Out] c^2*x^(1+m)*arctan(a*x)/(1+m)+2*a^2*c^2*x^(3+m)*arctan(a*x)/(3+m)+a^4*c^2*x
^(5+m)*arctan(a*x)/(5+m)-a*c^2*x^(2+m)*hypergeom([1, 1+1/2*m],[2+1/2*m],-a^
2*x^2)/(m^2+3*m+2)-2*a^3*c^2*x^(4+m)*hypergeom([1, 2+1/2*m],[3+1/2*m],-a^2*
x^2)/(m^2+7*m+12)-a^5*c^2*x^(6+m)*hypergeom([1, 3+1/2*m],[4+1/2*m],-a^2*x^2
)/(5+m)/(6+m)
```

Rubi [A] time = 0.16, antiderivative size = 201, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4948, 4852, 364}

$$-\frac{ac^2x^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}-\frac{2a^3c^2x^{m+4}\,{}_2F_1\left(1,\frac{m+4}{2};\frac{m+6}{2};-a^2x^2\right)}{m^2+7m+12}-\frac{a^5c^2x^{m+6}\,{}_2F_1\left(1,\frac{m+6}{2};\frac{m+8}{2};-a^2x^2\right)}{(m+5)(m+6)}+\frac{2a^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] (c^2*x^(1 + m)*ArcTan[a*x])/(1 + m) + (2*a^2*c^2*x^(3 + m)*ArcTan[a*x])/(3
+ m) + (a^4*c^2*x^(5 + m)*ArcTan[a*x])/(5 + m) - (a*c^2*x^(2 + m)*Hypergeom
etric2F1[1, (2 + m)/2, (4 + m)/2, -(a^2*x^2)])/(2 + 3*m + m^2) - (2*a^3*c^2
*x^(4 + m)*Hypergeometric2F1[1, (4 + m)/2, (6 + m)/2, -(a^2*x^2)])/(12 + 7*
m + m^2) - (a^5*c^2*x^(6 + m)*Hypergeometric2F1[1, (6 + m)/2, (8 + m)/2, -(
a^2*x^2)])/((5 + m)*(6 + m))
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)\,dx = \int \left(c^2x^m \tan^{-1}(ax) + 2a^2c^2x^{2+m}\tan^{-1}(ax) + a^4c^2x^{4+m}\tan^{-1}(ax)\right)dx$$
$$= c^2\int x^m \tan^{-1}(ax)\,dx + \left(2a^2c^2\right)\int x^{2+m}\tan^{-1}(ax)\,dx + \left(a^4c^2\right)\int x^{4+m}\tan^{-1}$$
$$= \frac{c^2x^{1+m}\tan^{-1}(ax)}{1+m} + \frac{2a^2c^2x^{3+m}\tan^{-1}(ax)}{3+m} + \frac{a^4c^2x^{5+m}\tan^{-1}(ax)}{5+m} - \frac{\left(ac^2\right)\int}{1+}$$
$$= \frac{c^2x^{1+m}\tan^{-1}(ax)}{1+m} + \frac{2a^2c^2x^{3+m}\tan^{-1}(ax)}{3+m} + \frac{a^4c^2x^{5+m}\tan^{-1}(ax)}{5+m} - \frac{ac^2x^{2+m}}{}$$

Mathematica [A] time = 0.14, size = 175, normalized size = 0.87

$$c^2x^{m+1}\left(\frac{a^4x^4\tan^{-1}(ax)}{m+5} - \frac{ax\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2} + \frac{2a^2x^2\tan^{-1}(ax)}{m+3} - \frac{a^5x^5\,{}_2F_1\left(1,\frac{m+6}{2};\frac{m+8}{2};-a^2x^2\right)}{(m+5)(m+6)} - \frac{2a}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x],x]
```

```
[Out] c^2*x^(1 + m)*(ArcTan[a*x]/(1 + m) + (2*a^2*x^2*ArcTan[a*x])/(3 + m) + (a^4
*x^4*ArcTan[a*x])/(5 + m) - (a*x*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2,
 -(a^2*x^2)])/(2 + 3*m + m^2) - (2*a^3*x^3*Hypergeometric2F1[1, (4 + m)/2,
(6 + m)/2, -(a^2*x^2)])/(12 + 7*m + m^2) - (a^5*x^5*Hypergeometric2F1[1, (6
 + m)/2, (8 + m)/2, -(a^2*x^2)])/((5 + m)*(6 + m)))
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)x^m \arctan\left(ax\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m*arctan(a*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.40, size = 376, normalized size = 1.87

$$\frac{a^{-1-m}c^2\left(-\frac{4x^m a^m\left(a^4m^2x^4+2m\,x^4a^4-a^2m^2x^2-4m\,x^2a^2+m^2+6m+8\right)}{(5+m)m(2+m)(4+m)} + \frac{8x^{6+m}a^{6+m}\arctan\left(\sqrt{a^2x^2}\right)}{(10+2m)\sqrt{a^2x^2}} + \frac{2x^m a^m\Phi\left(-a^2x^2,1,\frac{m}{2}\right)}{5+m}\right)}{4} + \frac{a^{-1-m}c^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x),x)
```

```
[Out] 1/4*a^(-1-m)*c^2*(-4*x^m*a^m*(a^4*m^2*x^4+2*a^4*m*x^4-a^2*m^2*x^2-4*a^2*m*x
^2+m^2+6*m+8)/(5+m)/m/(2+m)/(4+m)+8*x^(6+m)*a^(6+m)/(10+2*m)/(a^2*x^2)^(1/2
```

```
)*arctan((a^2*x^2)^(1/2))+2*x^m*a^m/(5+m)*LerchPhi(-a^2*x^2,1,1/2*m))+1/2*a
^(-1-m)*c^2*(-4*x^m*a^m*(a^2*m*x^2-m-2)/(3+m)/m/(2+m)+8*x^(4+m)*a^(4+m)/(6+
2*m)/(a^2*x^2)^(1/2)*arctan((a^2*x^2)^(1/2))+2/(4+m)*x^m*a^m*(-4-m)/(3+m)*L
erchPhi(-a^2*x^2,1,1/2*m))+1/4*a^(-1-m)*c^2*(4/(2+m)*x^m*a^m*(-m-2)/(1+m)/m
+8*x^(2+m)*a^(2+m)/(2+2*m)/(a^2*x^2)^(1/2)*arctan((a^2*x^2)^(1/2))+2*x^m*a^
m/(1+m)*LerchPhi(-a^2*x^2,1,1/2*m))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(\left(a^4c^2m^2+4\,a^4c^2m+3\,a^4c^2\right)x^5+2\left(a^2c^2m^2+6\,a^2c^2m+5\,a^2c^2\right)x^3+\left(c^2m^2+8\,c^2m+15\,c^2\right)x\right)x^m\arctan\left(ax\right)-(}{m^3+9\,m^2+23\,m}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x),x, algorithm="maxima")
```

```
[Out] (((a^4*c^2*m^2 + 4*a^4*c^2*m + 3*a^4*c^2)*x^5 + 2*(a^2*c^2*m^2 + 6*a^2*c^2*
m + 5*a^2*c^2)*x^3 + (c^2*m^2 + 8*c^2*m + 15*c^2)*x)*x^m*arctan(a*x) - (m^3
 + 9*m^2 + 23*m + 15)*integrate(((a^5*c^2*m^2 + 4*a^5*c^2*m + 3*a^5*c^2)*x^
5 + 2*(a^3*c^2*m^2 + 6*a^3*c^2*m + 5*a^3*c^2)*x^3 + (a*c^2*m^2 + 8*a*c^2*m
+ 15*a*c^2)*x)*x^m/(m^3 + (a^2*m^3 + 9*a^2*m^2 + 23*a^2*m + 15*a^2)*x^2 + 9
*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23*m + 15)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^m*atan(a*x)*(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x^m\,\mathrm{atan}\,(ax)\,dx+\int 2a^2x^2x^m\,\mathrm{atan}\,(ax)\,dx+\int a^4x^4x^m\,\mathrm{atan}\,(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2*atan(a*x),x)
```

```
[Out] c**2*(Integral(x**m*atan(a*x), x) + Integral(2*a**2*x**2*x**m*atan(a*x), x)
 + Integral(a**4*x**4*x**m*atan(a*x), x))
```

3.250 $\int x^m \left(c+a^2cx^2\right)\tan^{-1}(ax)\,dx$

Optimal. Leaf size=124

$$-\frac{acx^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}+\frac{a^2cx^{m+3}\tan^{-1}(ax)}{m+3}-\frac{a^3cx^{m+4}\,{}_2F_1\left(1,\frac{m+4}{2};\frac{m+6}{2};-a^2x^2\right)}{m^2+7m+12}+\frac{cx^{m+1}\tan^{-1}(ax)}{m+1}$$

```
[Out] c*x^(1+m)*arctan(a*x)/(1+m)+a^2*c*x^(3+m)*arctan(a*x)/(3+m)-a*c*x^(2+m)*hyp
ergeom([1, 1+1/2*m],[2+1/2*m],-a^2*x^2)/(m^2+3*m+2)-a^3*c*x^(4+m)*hypergeom
([1, 2+1/2*m],[3+1/2*m],-a^2*x^2)/(m^2+7*m+12)
```

Rubi [A] time = 0.08, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4950, 4852, 364}

$$-\frac{acx^{m+2}\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-a^2x^2\right)}{m^2+3m+2}-\frac{a^3cx^{m+4}\,{}_2F_1\left(1,\frac{m+4}{2};\frac{m+6}{2};-a^2x^2\right)}{m^2+7m+12}+\frac{a^2cx^{m+3}\tan^{-1}(ax)}{m+3}+\frac{cx^{m+1}\tan^{-1}(ax)}{m+1}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] (c*x^(1 + m)*ArcTan[a*x])/(1 + m) + (a^2*c*x^(3 + m)*ArcTan[a*x])/(3 + m) -
 (a*c*x^(2 + m)*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, -(a^2*x^2)])/(2
+ 3*m + m^2) - (a^3*c*x^(4 + m)*Hypergeometric2F1[1, (4 + m)/2, (6 + m)/2,
-(a^2*x^2)])/(12 + 7*m + m^2)
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int x^m \left(c + a^2 c x^2\right) \tan^{-1}(ax)\, dx = c \int x^m \tan^{-1}(ax)\, dx + \left(a^2 c\right) \int x^{2+m} \tan^{-1}(ax)\, dx$$

$$= \frac{c x^{1+m} \tan^{-1}(ax)}{1+m} + \frac{a^2 c x^{3+m} \tan^{-1}(ax)}{3+m} - \frac{(ac) \int \frac{x^{1+m}}{1+a^2x^2}\, dx}{1+m} - \frac{\left(a^3 c\right) \int \frac{x^{3+m}}{1+a^2x^2}\, dx}{3+m}$$

$$= \frac{c x^{1+m} \tan^{-1}(ax)}{1+m} + \frac{a^2 c x^{3+m} \tan^{-1}(ax)}{3+m} - \frac{a c x^{2+m} {}_2F_1\left(1, \frac{2+m}{2}; \frac{4+m}{2}; -a^2x^2\right)}{2+3m+m^2} - \frac{a^3 c}{}$$

Mathematica [A] time = 0.12, size = 111, normalized size = 0.90

$$c x^{m+1} \left(-\frac{a x\, {}_2F_1\left(1, \frac{m+2}{2}; \frac{m+4}{2}; -a^2 x^2\right)}{m^2+3m+2} + \left(\frac{a^2 x^2}{m+3} + \frac{1}{m+1}\right) \tan^{-1}(ax) - \frac{a^3 x^3\, {}_2F_1\left(1, \frac{m+4}{2}; \frac{m+6}{2}; -a^2 x^2\right)}{m^2+7m+12}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x],x]
```

```
[Out] c*x^(1 + m)*(((1 + m)^(-1) + (a^2*x^2)/(3 + m))*ArcTan[a*x] - (a*x*Hypergeo
metric2F1[1, (2 + m)/2, (4 + m)/2, -(a^2*x^2)])/(2 + 3*m + m^2) - (a^3*x^3*
Hypergeometric2F1[1, (4 + m)/2, (6 + m)/2, -(a^2*x^2)])/(12 + 7*m + m^2))
```

fricas [F] time = 1.19, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2 + c\right) x^m \arctan\left(ax\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*x^m*arctan(a*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.17, size = 222, normalized size = 1.79

$$\frac{a^{-1-m} c \left(-\frac{4 x^m a^m \left(m x^2 a^2 - m - 2\right)}{(3+m) m (2+m)} + \frac{8 x^{4+m} a^{4+m} \arctan\left(\sqrt{a^2 x^2}\right)}{(6+2m)\sqrt{a^2 x^2}} + \frac{2 x^m a^m (-4-m) \Phi\left(-a^2 x^2, 1, \frac{m}{2}\right)}{(4+m)(3+m)}\right)}{4} + \frac{a^{-1-m} c \left(\frac{4 x^m a^m (-m-2)}{(2+m)(1+m) m} + \frac{8 x^{2+m} a^{2+m} \text{ar}}{(2+2m)}\right.}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)*arctan(a*x),x)
```

```
[Out] 1/4*a^(-1-m)*c*(-4*x^m*a^m*(a^2*m*x^2-m-2)/(3+m)/m/(2+m)+8*x^(4+m)*a^(4+m)/
(6+2*m)/(a^2*x^2)^(1/2)*arctan((a^2*x^2)^(1/2))+2/(4+m)*x^m*a^m*(-4-m)/(3+m
)*LerchPhi(-a^2*x^2,1,1/2*m))+1/4*a^(-1-m)*c*(4/(2+m)*x^m*a^m*(-m-2)/(1+m)/
m+8*x^(2+m)*a^(2+m)/(2+2*m)/(a^2*x^2)^(1/2)*arctan((a^2*x^2)^(1/2))+2*x^m*a
^m/(1+m)*LerchPhi(-a^2*x^2,1,1/2*m))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(\left(a^{2}cm+a^{2}c\right)x^{3}+(cm+3\,c)x\right)x^{m}\arctan\left(ax\right)-\left(m^{2}+4\,m+3\right)\int\frac{\left(\left(a^{3}cm+a^{3}c\right)x^{3}+(acm+3\,ac)x\right)x^{m}}{\left(a^{2}m^{2}+4\,a^{2}m+3\,a^{2}\right)x^{2}+m^{2}+4\,m+3}\,dx}{m^{2}+4\,m+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] (((a^2*c*m + a^2*c)*x^3 + (c*m + 3*c)*x)*x^m*arctan(a*x) - (m^2 + 4*m + 3)*
integrate(((a^3*c*m + a^3*c)*x^3 + (a*c*m + 3*a*c)*x)*x^m/((a^2*m^2 + 4*a^2
*m + 3*a^2)*x^2 + m^2 + 4*m + 3), x))/(m^2 + 4*m + 3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^{m}\,\mathrm{atan}\left(a\,x\right)\,\left(c\,a^{2}\,x^{2}+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)*(c + a^2*c*x^2),x)
```

```
[Out] int(x^m*atan(a*x)*(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^{m}\,\mathrm{atan}\left(ax\right)dx+\int a^{2}x^{2}x^{m}\,\mathrm{atan}\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)*atan(a*x),x)
```

```
[Out] c*(Integral(x**m*atan(a*x), x) + Integral(a**2*x**2*x**m*atan(a*x), x))
```

3.251 $\int \frac{x^m \tan^{-1}(ax)}{c+a^2cx^2} \, dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)}{a^2cx^2+c},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)/(a^2*c*x^2+c),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)}{c+a^2cx^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x])/(c + a^2*c*x^2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x])/(c + a^2*c*x^2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)}{c+a^2cx^2} \, dx = \int \frac{x^m \tan^{-1}(ax)}{c+a^2cx^2} \, dx$$

Mathematica [A] time = 0.91, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)}{c+a^2cx^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x])/(c + a^2*c*x^2),x]
[Out] Integrate[(x^m*ArcTan[a*x])/(c + a^2*c*x^2), x]
```

fricas [A] time = 1.01, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)/(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.65, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)}{a^2c\,x^2+c} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)/(a^2*c*x^2+c),x)
```

```
[Out] int(x^m*arctan(a*x)/(a^2*c*x^2+c),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)}{a^2cx^2 + c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arctan(a*x)/(a^2*c*x^2 + c), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\,x)}{c\,a^2\,x^2 + c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^m*atan(a*x))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m \operatorname{atan}(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**m*atan(a*x)/(a**2*x**2 + 1), x)/c
```

3.252 $\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)}{\left(a^2cx^2+c\right)^2},x\right)$$

[Out] Unintegrable(x^m*arctan(a*x)/(a^2*c*x^2+c)^2,x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]

[Out] Defer[Int][(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^2, x]

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2} dx = \int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2} dx$$

Mathematica [A] time = 0.65, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^2,x]

[Out] Integrate[(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^2, x]

fricas [A] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="fricas")

[Out] integral(x^m*arctan(a*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.45, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan\left(a x\right)}{\left(a^{2} c \,x^{2}+c \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)/(a^2*c*x^2+c)^2,x)
[Out] int(x^m*arctan(a*x)/(a^2*c*x^2+c)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan\left(ax\right)}{{\left(a^{2} c x^{2} + c\right)}^{2}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)/(a^2*c*x^2 + c)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\mathrm{atan}\left(a\,x\right)}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x))/(c + a^2*c*x^2)^2,x)
[Out] int((x^m*atan(a*x))/(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m} \operatorname{atan}{\left(a x \right)}}{a^{4} x^{4} + 2 a^{2} x^{2} + 1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)/(a**2*c*x**2+c)**2,x)
[Out] Integral(x**m*atan(a*x)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.253 $\int x^m \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x) \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^{5/2} \tan^{-1}(a x),x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x) \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x], x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x) \, dx=\int x^m \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x) \, dx$$

Mathematica [A] time = 0.99, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x) \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x],x]
```

```
[Out] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x], x]
```

fricas [A] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4 c^2 x^4 + 2\, a^2 c^2 x^2 + c^2\right) \sqrt{a^2 c x^2 + c}\, x^m \arctan\left(a x\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m*arctan
(a*x), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.94, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c\, x^{2}+c\right)^{\frac{5}{2}} \arctan\left(a x\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x)
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^{2} c x^{2}+c\right)^{\frac{5}{2}} x^{m} \arctan\left(a x\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^m*arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^{m}\, \mathrm{atan}\left(a\, x\right) \left(c\, a^{2}\, x^{2}+c\right)^{5/2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)*(c + a^2*c*x^2)^(5/2),x)
[Out] int(x^m*atan(a*x)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)*atan(a*x),x)
[Out] Timed out
```

3.254 $\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax) \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^m \left(a^2cx^2+c\right)^{3/2} \tan^{-1}(ax),x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax) \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x], x]
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax) \, dx = \int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax) \, dx$$

Mathematica [A] time = 0.53, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax) \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x],x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x], x]
```

fricas [A] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^2+c\right)^{\frac{3}{2}} x^m \arctan\left(ax\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.89, size = 0, normalized size = 0.00

$$\int x^m \left(a^2c\,x^2+c\right)^{\frac{3}{2}} \arctan\left(ax\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{3}{2}} x^m \arctan\left(ax\right) \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}\left(a\,x\right) \left(c\,a^2\,x^2 + c\right)^{3/2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^m*atan(a*x)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)*atan(a*x),x)
```

```
[Out] Timed out
```

3.255 $\int x^m \sqrt{c+a^2 c x^2} \tan^{-1}(ax)\,dx$

Optimal. Leaf size=113

$$\frac{c\text{Int}\left(\frac{x^m \tan^{-1}(ax)}{\sqrt{a^2cx^2+c}},x\right)}{m+2}-\frac{ax^{m+2}\sqrt{a^2cx^2+c}\ {}_2F_1\left(1,\frac{m+3}{2};\frac{m+4}{2};-a^2x^2\right)}{(m+2)^2}+\frac{x^{m+1}\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)}{m+2}$$

```
[Out] x^(1+m)*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/(2+m)-a*x^(2+m)*hypergeom([1, 3/2+1
/2*m],[2+1/2*m],-a^2*x^2)*(a^2*c*x^2+c)^(1/2)/(2+m)^2+c*Unintegrable(x^m*ar
ctan(a*x)/(a^2*c*x^2+c)^(1/2),x)/(2+m)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \sqrt{c+a^2cx^2} \tan^{-1}(ax)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] (x^(1 + m)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(2 + m) - (a*c*x^(2 + m)*Sqrt[1
 + a^2*x^2]*Hypergeometric2F1[1/2, (2 + m)/2, (4 + m)/2, -(a^2*x^2)])/((2 +
 m)^2*Sqrt[c + a^2*c*x^2]) + (c*Defer[Int][(x^m*ArcTan[a*x])/Sqrt[c + a^2*c
*x^2], x])/(2 + m)
```

Rubi steps

$$\begin{aligned}\int x^m\sqrt{c+a^2cx^2}\tan^{-1}(ax)\,dx &= \frac{x^{1+m}\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{2+m}+\frac{c\int\frac{x^m\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{2+m}-\frac{(ac)\int\frac{x^{1+m}}{\sqrt{c+a^2cx^2}}\,dx}{2+m}\\ &= \frac{x^{1+m}\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{2+m}+\frac{c\int\frac{x^m\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{2+m}-\frac{\left(ac\sqrt{1+a^2x^2}\right)\int\frac{x^{1+m}}{\sqrt{1+a^2x^2}}\,dx}{(2+m)\sqrt{c+a^2cx^2}}\\ &= \frac{x^{1+m}\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{2+m}-\frac{acx^{2+m}\sqrt{1+a^2x^2}\ {}_2F_1\left(\frac{1}{2},\frac{2+m}{2};\frac{4+m}{2};-a^2x^2\right)}{(2+m)^2\sqrt{c+a^2cx^2}}+\frac{c\int}{}\end{aligned}$$

Mathematica [A] time = 0.11, size = 0, normalized size = 0.00

$$\int x^m\sqrt{c+a^2cx^2}\tan^{-1}(ax)\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x],x]
```

```
[Out] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x], x]
```

fricas [A] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x^m\arctan(ax),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x), x)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 0.93, size = 0, normalized size = 0.00

$$\int x^{m}\sqrt{a^{2}c\,x^{2}+c}\;\arctan\left(ax\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^{2}cx^{2}+c}\,x^{m}\arctan\left(ax\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int x^{m}\,\mathrm{atan}\left(a\,x\right)\,\sqrt{c\,a^{2}\,x^{2}+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^m*atan(a*x)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{m}\sqrt{c\left(a^{2}x^{2}+1\right)}\;\mathrm{atan}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)*atan(a*x),x)
```

```
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))*atan(a*x), x)
```

3.256 $\int \frac{x^m \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)}{\sqrt{a^2cx^2+c}}, x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]
[Out] Defer[Int][(x^m*ArcTan[a*x])/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}} \, dx = \int \frac{x^m \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}} \, dx$$

Mathematica [A] time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x])/Sqrt[c + a^2*c*x^2],x]
[Out] Integrate[(x^m*ArcTan[a*x])/Sqrt[c + a^2*c*x^2], x]
```

fricas [A] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)/sqrt(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)}{\sqrt{a^2cx^2+c}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] integrate(x^m*arctan(a*x)/sqrt(a^2*c*x^2 + c), x)
```

maple [A] time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)}{\sqrt{a^{2} c\, x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)}{\sqrt{a^{2} c x^{2} + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)/sqrt(a^2*c*x^2 + c), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\mathrm{atan}\left(a\,x\right)}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x))/(c + a^2*c*x^2)^(1/2),x)
[Out] int((x^m*atan(a*x))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \operatorname{atan}{\left(a x \right)}}{\sqrt{c \left(a^{2} x^{2} + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m*atan(a*x)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.257 $\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] Defer[Int][(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}} \, dx = \int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}} \, dx$$

Mathematica [A] time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] Integrate[(x^m*ArcTan[a*x])/(c + a^2*c*x^2)^(3/2), x]
```

fricas [A] time = 0.73, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m \arctan(ax)}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 +
 c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)}{\left(a^2cx^2+c\right)^{\frac{3}{2}}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] integrate(x^m*arctan(a*x)/(a^2*c*x^2 + c)^(3/2), x)
```

maple [A] time = 1.59, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)}{\left(a^2 c\,x^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x)
[Out] int(x^m*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)}{\left(a^2 c x^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\mathrm{atan}\left(a\,x\right)}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x))/(c + a^2*c*x^2)^(3/2),x)
[Out] int((x^m*atan(a*x))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m\,\mathrm{atan}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)/(a**2*c*x**2+c)**(3/2),x)
[Out] Integral(x**m*atan(a*x)/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.258 $\int x^3 \left(c+a^2 c x^2\right) \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=124

$$-\frac{c\tan^{-1}(ax)^2}{12a^4}+\frac{cx\tan^{-1}(ax)}{6a^3}+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^2-\frac{cx^2}{180a^2}-\frac{7c\log\left(a^2x^2+1\right)}{90a^4}-\frac{1}{15}acx^5\tan^{-1}(ax)+\frac{1}{4}cx^4\tan^{-1}(ax)^2$$

```
[Out] -1/180*c*x^2/a^2+1/60*c*x^4+1/6*c*x*arctan(a*x)/a^3-1/18*c*x^3*arctan(a*x)/
a-1/15*a*c*x^5*arctan(a*x)-1/12*c*arctan(a*x)^2/a^4+1/4*c*x^4*arctan(a*x)^2
+1/6*a^2*c*x^6*arctan(a*x)^2-7/90*c*ln(a^2*x^2+1)/a^4
```

Rubi [A] time = 0.43, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4950, 4852, 4916, 266, 43, 4846, 260, 4884}

$$-\frac{cx^2}{180a^2}-\frac{7c\log\left(a^2x^2+1\right)}{90a^4}+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^2+\frac{cx\tan^{-1}(ax)}{6a^3}-\frac{c\tan^{-1}(ax)^2}{12a^4}-\frac{1}{15}acx^5\tan^{-1}(ax)+\frac{1}{4}cx^4\tan^{-1}(ax)^2$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] -(c*x^2)/(180*a^2) + (c*x^4)/60 + (c*x*ArcTan[a*x])/(6*a^3) - (c*x^3*ArcTan
[a*x])/(18*a) - (a*c*x^5*ArcTan[a*x])/15 - (c*ArcTan[a*x]^2)/(12*a^4) + (c*
x^4*ArcTan[a*x]^2)/4 + (a^2*c*x^6*ArcTan[a*x]^2)/6 - (7*c*Log[1 + a^2*x^2])
/(90*a^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^2\,dx = c\int x^3\tan^{-1}(ax)^2\,dx+\left(a^2c\right)\int x^5\tan^{-1}(ax)^2\,dx$$

$$=\frac{1}{4}cx^4\tan^{-1}(ax)^2+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^2-\frac{1}{2}(ac)\int\frac{x^4\tan^{-1}(ax)}{1+a^2x^2}\,dx-\frac{1}{3}\left(a^3c\right)$$

$$=\frac{1}{4}cx^4\tan^{-1}(ax)^2+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^2-\frac{c\int x^2\tan^{-1}(ax)\,dx}{2a}+\frac{c\int\frac{x^2\tan^{-1}(ax)}{1+a^2x^2}}{2a}$$

$$=-\frac{cx^3\tan^{-1}(ax)}{6a}-\frac{1}{15}acx^5\tan^{-1}(ax)+\frac{1}{4}cx^4\tan^{-1}(ax)^2+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^2$$

$$=\frac{cx\tan^{-1}(ax)}{2a^3}-\frac{cx^3\tan^{-1}(ax)}{18a}-\frac{1}{15}acx^5\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)^2}{4a^4}+\frac{1}{4}cx^4\tan$$

$$=\frac{cx\tan^{-1}(ax)}{6a^3}-\frac{cx^3\tan^{-1}(ax)}{18a}-\frac{1}{15}acx^5\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)^2}{12a^4}+\frac{1}{4}cx^4\tan$$

$$=\frac{cx^2}{20a^2}+\frac{cx^4}{60}+\frac{cx\tan^{-1}(ax)}{6a^3}-\frac{cx^3\tan^{-1}(ax)}{18a}-\frac{1}{15}acx^5\tan^{-1}(ax)-\frac{c\tan^{-1}(a}{12a^4}$$

$$=-\frac{cx^2}{180a^2}+\frac{cx^4}{60}+\frac{cx\tan^{-1}(ax)}{6a^3}-\frac{cx^3\tan^{-1}(ax)}{18a}-\frac{1}{15}acx^5\tan^{-1}(ax)-\frac{c\tan^{-}}{12}$$

Mathematica [A] time = 0.04, size = 89, normalized size = 0.72

$$\frac{c\left(3a^4x^4-a^2x^2-14\log\left(a^2x^2+1\right)+15\left(2a^6x^6+3a^4x^4-1\right)\tan^{-1}(ax)^2-2ax\left(6a^4x^4+5a^2x^2-15\right)\tan^{-1}(ax)\right.}{180a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*(-(a^2*x^2) + 3*a^4*x^4 - 2*a*x*(-15 + 5*a^2*x^2 + 6*a^4*x^4)*ArcTan[a*x
] + 15*(-1 + 3*a^4*x^4 + 2*a^6*x^6)*ArcTan[a*x]^2 - 14*Log[1 + a^2*x^2]))/(
180*a^4)
```

fricas [A] time = 1.34, size = 97, normalized size = 0.78

$$\frac{3\,a^4cx^4 - a^2cx^2 + 15\left(2\,a^6cx^6 + 3\,a^4cx^4 - c\right)\arctan\left(ax\right)^2 - 2\left(6\,a^5cx^5 + 5\,a^3cx^3 - 15\,acx\right)\arctan\left(ax\right) - 14\,c\log\left(a\right.}{180\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/180*(3*a^4*c*x^4 - a^2*c*x^2 + 15*(2*a^6*c*x^6 + 3*a^4*c*x^4 - c)*arctan(
a*x)^2 - 2*(6*a^5*c*x^5 + 5*a^3*c*x^3 - 15*a*c*x)*arctan(a*x) - 14*c*log(a^
2*x^2 + 1))/a^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 107, normalized size = 0.86

$$-\frac{c\,x^2}{180a^2}+\frac{c\,x^4}{60}+\frac{cx\arctan\left(ax\right)}{6a^3}-\frac{c\,x^3\arctan\left(ax\right)}{18a}-\frac{ac\,x^5\arctan\left(ax\right)}{15}-\frac{c\arctan\left(ax\right)^2}{12a^4}+\frac{c\,x^4\arctan\left(ax\right)^2}{4}+\frac{a^2c\,x^6\arctan}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)*arctan(a*x)^2,x)
```

```
[Out] -1/180*c*x^2/a^2+1/60*c*x^4+1/6*c*x*arctan(a*x)/a^3-1/18*c*x^3*arctan(a*x)/
a-1/15*a*c*x^5*arctan(a*x)-1/12*c*arctan(a*x)^2/a^4+1/4*c*x^4*arctan(a*x)^2
+1/6*a^2*c*x^6*arctan(a*x)^2-7/90*c*ln(a^2*x^2+1)/a^4
```

maxima [A] time = 0.44, size = 116, normalized size = 0.94

$$-\frac{1}{90}\,a\left(\frac{6\,a^4cx^5 + 5\,a^2cx^3 - 15\,cx}{a^4} + \frac{15\,c\arctan\left(ax\right)}{a^5}\right)\arctan\left(ax\right)+\frac{1}{12}\left(2\,a^2cx^6 + 3\,cx^4\right)\arctan\left(ax\right)^2+\frac{3\,a^4cx^4 - a^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -1/90*a*((6*a^4*c*x^5 + 5*a^2*c*x^3 - 15*c*x)/a^4 + 15*c*arctan(a*x)/a^5)*a
rctan(a*x) + 1/12*(2*a^2*c*x^6 + 3*c*x^4)*arctan(a*x)^2 + 1/180*(3*a^4*c*x^
4 - a^2*c*x^2 + 15*c*arctan(a*x)^2 - 14*c*log(a^2*x^2 + 1))/a^4
```

mupad [B] time = 0.57, size = 102, normalized size = 0.82

$$-\frac{c\,\left(14\,\ln\left(a^2\,x^2+1\right) + a^2\,x^2 - 3\,a^4\,x^4 + 15\,\mathrm{atan}\left(a\,x\right)^2 + 10\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right) + 12\,a^5\,x^5\,\mathrm{atan}\left(a\,x\right) - 30\,a\,x\,\mathrm{atan}\left(a\,x\right.}{180\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^2*(c + a^2*c*x^2),x)
```

```
[Out] -(c*(14*log(a^2*x^2 + 1) + a^2*x^2 - 3*a^4*x^4 + 15*atan(a*x)^2 + 10*a^3*x^
3*atan(a*x) + 12*a^5*x^5*atan(a*x) - 30*a*x*atan(a*x) - 45*a^4*x^4*atan(a*x
)^2 - 30*a^6*x^6*atan(a*x)^2))/(180*a^4)
```

sympy [A] time = 1.95, size = 121, normalized size = 0.98

$$\begin{cases} \frac{a^2cx^6 \operatorname{atan}^2(ax)}{6} - \frac{acx^5 \operatorname{atan}(ax)}{15} + \frac{cx^4 \operatorname{atan}^2(ax)}{4} + \frac{cx^4}{60} - \frac{cx^3 \operatorname{atan}(ax)}{18a} - \frac{cx^2}{180a^2} + \frac{cx \operatorname{atan}(ax)}{6a^3} - \frac{7c \log\left(x^2+\frac{1}{a^2}\right)}{90a^4} - \frac{c \operatorname{atan}^2(ax)}{12a^4} & \text{fo} \\ 0 & \text{ot} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)*atan(a*x)**2,x)
```

```
[Out] Piecewise((a**2*c*x**6*atan(a*x)**2/6 - a*c*x**5*atan(a*x)/15 + c*x**4*atan
(a*x)**2/4 + c*x**4/60 - c*x**3*atan(a*x)/(18*a) - c*x**2/(180*a**2) + c*x*
atan(a*x)/(6*a**3) - 7*c*log(x**2 + a**(-2))/(90*a**4) - c*atan(a*x)**2/(12
*a**4), Ne(a, 0)), (0, True))
```

3.259 $\int x^2 \left(c + a^2cx^2\right) \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=156

$$-\frac{2ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{15a^3}-\frac{2ic\tan^{-1}(ax)^2}{15a^3}-\frac{c\tan^{-1}(ax)}{30a^3}-\frac{4c\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{15a^3}+\frac{1}{5}a^2cx^5\tan^{-1}(ax)^2+\frac{cx}{30a^2}-\frac{1}{10}acx^4\text{ ta}$$

```
[Out] 1/30*c*x/a^2+1/30*c*x^3-1/30*c*arctan(a*x)/a^3-2/15*c*x^2*arctan(a*x)/a-1/1
0*a*c*x^4*arctan(a*x)-2/15*I*c*arctan(a*x)^2/a^3+1/3*c*x^3*arctan(a*x)^2+1/
5*a^2*c*x^5*arctan(a*x)^2-4/15*c*arctan(a*x)*ln(2/(1+I*a*x))/a^3-2/15*I*c*p
olylog(2,1-2/(1+I*a*x))/a^3
```

Rubi [A] time = 0.41, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 302}

$$-\frac{2ic\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{15a^3}+\frac{1}{5}a^2cx^5\tan^{-1}(ax)^2+\frac{cx}{30a^2}-\frac{2ic\tan^{-1}(ax)^2}{15a^3}-\frac{c\tan^{-1}(ax)}{30a^3}-\frac{4c\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{15a^3}-\frac{1}{10}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*x)/(30*a^2) + (c*x^3)/30 - (c*ArcTan[a*x])/(30*a^3) - (2*c*x^2*ArcTan[a*
x])/(15*a) - (a*c*x^4*ArcTan[a*x])/10 - (((2*I)/15)*c*ArcTan[a*x]^2)/a^3 +
(c*x^3*ArcTan[a*x]^2)/3 + (a^2*c*x^5*ArcTan[a*x]^2)/5 - (4*c*ArcTan[a*x]*Lo
g[2/(1 + I*a*x)])/(15*a^3) - (((2*I)/15)*c*PolyLog[2, 1 - 2/(1 + I*a*x)])/a
^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
```

```
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int x^2 \left(c+a^2cx^2\right) \tan^{-1}(ax)^2 \, dx = c\int x^2 \tan^{-1}(ax)^2 \, dx + \left(a^2c\right)\int x^4 \tan^{-1}(ax)^2 \, dx$$
$$= \frac{1}{3}cx^3 \tan^{-1}(ax)^2 + \frac{1}{5}a^2cx^5 \tan^{-1}(ax)^2 - \frac{1}{3}(2ac)\int \frac{x^3 \tan^{-1}(ax)}{1+a^2x^2} \, dx - \frac{1}{5}\left(2a^3c\right)\int$$
$$= \frac{1}{3}cx^3 \tan^{-1}(ax)^2 + \frac{1}{5}a^2cx^5 \tan^{-1}(ax)^2 - \frac{(2c)\int x \tan^{-1}(ax) \, dx}{3a} + \frac{(2c)\int \frac{x \tan^{-1}(ax}{1+a^2x^2}}{3a}$$
$$= -\frac{cx^2 \tan^{-1}(ax)}{3a} - \frac{1}{10}acx^4 \tan^{-1}(ax) - \frac{ic \tan^{-1}(ax)^2}{3a^3} + \frac{1}{3}cx^3 \tan^{-1}(ax)^2 + \frac{1}{5}a^2cx$$
$$= \frac{cx}{3a^2} - \frac{2cx^2 \tan^{-1}(ax)}{15a} - \frac{1}{10}acx^4 \tan^{-1}(ax) - \frac{2ic \tan^{-1}(ax)^2}{15a^3} + \frac{1}{3}cx^3 \tan^{-1}(ax)^2$$
$$= \frac{cx}{30a^2} + \frac{cx^3}{30} - \frac{c \tan^{-1}(ax)}{3a^3} - \frac{2cx^2 \tan^{-1}(ax)}{15a} - \frac{1}{10}acx^4 \tan^{-1}(ax) - \frac{2ic \tan^{-1}(ax}{15a^3}$$
$$= \frac{cx}{30a^2} + \frac{cx^3}{30} - \frac{c \tan^{-1}(ax)}{30a^3} - \frac{2cx^2 \tan^{-1}(ax)}{15a} - \frac{1}{10}acx^4 \tan^{-1}(ax) - \frac{2ic \tan^{-1}(ax}{15a^3}$$
$$= \frac{cx}{30a^2} + \frac{cx^3}{30} - \frac{c \tan^{-1}(ax)}{30a^3} - \frac{2cx^2 \tan^{-1}(ax)}{15a} - \frac{1}{10}acx^4 \tan^{-1}(ax) - \frac{2ic \tan^{-1}(ax}{15a^3}$$

Mathematica [A] time = 0.64, size = 104, normalized size = 0.67

$$\frac{c\left(a^3x^3+2\left(3a^5x^5+5a^3x^3+2i\right)\tan^{-1}(ax)^2-\tan^{-1}(ax)\left(3a^4x^4+4a^2x^2+8\log\left(1+e^{2i\tan^{-1}(ax)}\right)+1\right)+4i\text{Li}_2\left(-e\right.\right.}{30a^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*(a*x + a^3*x^3 + 2*(2*I + 5*a^3*x^3 + 3*a^5*x^5)*ArcTan[a*x]^2 - ArcTan[
a*x]*(1 + 4*a^2*x^2 + 3*a^4*x^4 + 8*Log[1 + E^((2*I)*ArcTan[a*x])]) + (4*I)
*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))/(30*a^3)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^4+cx^2\right)\arctan(ax)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^4 + c*x^2)*arctan(a*x)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.12, size = 258, normalized size = 1.65

$$\frac{a^2c\,x^5\arctan(ax)^2}{5}+\frac{c\,x^3\arctan(ax)^2}{3}-\frac{ac\,x^4\arctan(ax)}{10}-\frac{2c\,x^2\arctan(ax)}{15a}+\frac{2c\arctan(ax)\ln\left(a^2x^2+1\right)}{15a^3}+\frac{c\,x^3}{30}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)*arctan(a*x)^2,x)
```

```
[Out] 1/5*a^2*c*x^5*arctan(a*x)^2+1/3*c*x^3*arctan(a*x)^2-1/10*a*c*x^4*arctan(a*x
)-2/15*c*x^2*arctan(a*x)/a+2/15/a^3*c*arctan(a*x)*ln(a^2*x^2+1)+1/30*c*x^3+
1/30*c*x/a^2-1/30*c*arctan(a*x)/a^3+1/15*I/a^3*c*ln(a*x-I)*ln(a^2*x^2+1)-1/
15*I/a^3*c*dilog(-1/2*I*(I+a*x))+1/15*I/a^3*c*dilog(1/2*I*(a*x-I))-1/30*I/a
^3*c*ln(a*x-I)^2+1/30*I/a^3*c*ln(I+a*x)^2-1/15*I/a^3*c*ln(I+a*x)*ln(a^2*x^2
+1)+1/15*I/a^3*c*ln(I+a*x)*ln(1/2*I*(a*x-I))-1/15*I/a^3*c*ln(a*x-I)*ln(-1/2
*I*(I+a*x))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{60}\left(3\,a^2cx^5+5\,cx^3\right)\arctan\left(ax\right)^2-\frac{1}{240}\left(3\,a^2cx^5+5\,cx^3\right)\log\left(a^2x^2+1\right)^2+\int\frac{180\left(a^4cx^6+2\,a^2cx^4+cx^2\right)\mathrm{arcta}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/60*(3*a^2*c*x^5 + 5*c*x^3)*arctan(a*x)^2 - 1/240*(3*a^2*c*x^5 + 5*c*x^3)*
log(a^2*x^2 + 1)^2 + integrate(1/240*(180*(a^4*c*x^6 + 2*a^2*c*x^4 + c*x^2)
*arctan(a*x)^2 + 15*(a^4*c*x^6 + 2*a^2*c*x^4 + c*x^2)*log(a^2*x^2 + 1)^2 -
8*(3*a^3*c*x^5 + 5*a*c*x^3)*arctan(a*x) + 4*(3*a^4*c*x^6 + 5*a^2*c*x^4)*log
(a^2*x^2 + 1))/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^2*(c + a^2*c*x^2),x)
```

```
[Out] int(x^2*atan(a*x)^2*(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^2\,\mathrm{atan}^2\left(ax\right)dx+\int a^2x^4\,\mathrm{atan}^2\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)*atan(a*x)**2,x)
```

```
[Out] c*(Integral(x**2*atan(a*x)**2, x) + Integral(a**2*x**4*atan(a*x)**2, x))
```

3.260 $\int x \left(c+a^2 c x^2\right) \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=96

$$\frac{c\left(a^2x^2+1\right)}{12a^2}+\frac{c\log\left(a^2x^2+1\right)}{6a^2}+\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}{4a^2}-\frac{cx\left(a^2x^2+1\right)\tan^{-1}(ax)}{6a}-\frac{cx\tan^{-1}(ax)}{3a}$$

```
[Out] 1/12*c*(a^2*x^2+1)/a^2-1/3*c*x*arctan(a*x)/a-1/6*c*x*(a^2*x^2+1)*arctan(a*x
)/a+1/4*c*(a^2*x^2+1)^2*arctan(a*x)^2/a^2+1/6*c*ln(a^2*x^2+1)/a^2
```

Rubi [A] time = 0.05, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.222, Rules used = {4930, 4878, 4846, 260}

$$\frac{c\left(a^2x^2+1\right)}{12a^2}+\frac{c\log\left(a^2x^2+1\right)}{6a^2}+\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}{4a^2}-\frac{cx\left(a^2x^2+1\right)\tan^{-1}(ax)}{6a}-\frac{cx\tan^{-1}(ax)}{3a}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*(1 + a^2*x^2))/(12*a^2) - (c*x*ArcTan[a*x])/(3*a) - (c*x*(1 + a^2*x^2)*A
rcTan[a*x])/(6*a) + (c*(1 + a^2*x^2)^2*ArcTan[a*x]^2)/(4*a^2) + (c*Log[1 +
a^2*x^2])/(6*a^2)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^2\,dx = \frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}{4a^2} - \frac{\int\left(c+a^2cx^2\right)\tan^{-1}(ax)\,dx}{2a}$$
$$= \frac{c\left(1+a^2x^2\right)}{12a^2} - \frac{cx\left(1+a^2x^2\right)\tan^{-1}(ax)}{6a} + \frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}{4a^2} - \frac{c\int\tan^-}{3}$$
$$= \frac{c\left(1+a^2x^2\right)}{12a^2} - \frac{cx\tan^{-1}(ax)}{3a} - \frac{cx\left(1+a^2x^2\right)\tan^{-1}(ax)}{6a} + \frac{c\left(1+a^2x^2\right)^2\tan^{-1}(}{4a^2}$$
$$= \frac{c\left(1+a^2x^2\right)}{12a^2} - \frac{cx\tan^{-1}(ax)}{3a} - \frac{cx\left(1+a^2x^2\right)\tan^{-1}(ax)}{6a} + \frac{c\left(1+a^2x^2\right)^2\tan^{-1}(}{4a^2}$$

Mathematica [A] time = 0.03, size = 64, normalized size = 0.67

$$\frac{c\left(a^2x^2+2\log\left(a^2x^2+1\right)-2ax\left(a^2x^2+3\right)\tan^{-1}(ax)+3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2\right)}{12a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*(a^2*x^2 - 2*a*x*(3 + a^2*x^2)*ArcTan[a*x] + 3*(1 + a^2*x^2)^2*ArcTan[a*
x]^2 + 2*Log[1 + a^2*x^2]))/(12*a^2)
```

fricas [A] time = 0.59, size = 74, normalized size = 0.77

$$\frac{a^2cx^2+3\left(a^4cx^4+2\,a^2cx^2+c\right)\arctan\left(ax\right)^2-2\left(a^3cx^3+3\,acx\right)\arctan\left(ax\right)+2\,c\log\left(a^2x^2+1\right)}{12\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/12*(a^2*c*x^2 + 3*(a^4*c*x^4 + 2*a^2*c*x^2 + c)*arctan(a*x)^2 - 2*(a^3*c*
x^3 + 3*a*c*x)*arctan(a*x) + 2*c*log(a^2*x^2 + 1))/a^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 85, normalized size = 0.89

$$\frac{a^2c\arctan\left(ax\right)^2x^4}{4}+\frac{c\arctan\left(ax\right)^2x^2}{2}-\frac{ac\arctan\left(ax\right)x^3}{6}-\frac{cx\arctan\left(ax\right)}{2a}+\frac{c\arctan\left(ax\right)^2}{4a^2}+\frac{c\,x^2}{12}+\frac{c\ln\left(a^2x^2+1\right.}{6a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)*arctan(a*x)^2,x)
```

```
[Out] 1/4*a^2*c*arctan(a*x)^2*x^4+1/2*c*arctan(a*x)^2*x^2-1/6*a*c*arctan(a*x)*x^3
-1/2*c*x*arctan(a*x)/a+1/4/a^2*c*arctan(a*x)^2+1/12*c*x^2+1/6*c*ln(a^2*x^2+
1)/a^2
```

maxima [A] time = 0.32, size = 87, normalized size = 0.91

$$\frac{\left(a^{2}cx^{2}+c\right)^{2}\arctan\left(ax\right)^{2}}{4\,a^{2}c}+\frac{\left(c^{2}x^{2}+\frac{2\,c^{2}\log\left(a^{2}x^{2}+1\right)}{a^{2}}\right)a-2\left(a^{2}c^{2}x^{3}+3\,c^{2}x\right)\arctan\left(ax\right)}{12\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/4*(a^2*c*x^2 + c)^2*arctan(a*x)^2/(a^2*c) + 1/12*((c^2*x^2 + 2*c^2*log(a^
2*x^2 + 1)/a^2)*a - 2*(a^2*c^2*x^3 + 3*c^2*x)*arctan(a*x))/(a*c)
```

mupad [B] time = 0.51, size = 83, normalized size = 0.86

$$\frac{c\,\left(6\,x^{2}\,\mathrm{atan}\left(a\,x\right)^{2}+x^{2}\right)}{12}+\frac{\frac{c\left(3\,\mathrm{atan}\left(a\,x\right)^{2}+2\,\ln\left(a^{2}\,x^{2}+1\right)\right)}{12}-\frac{a\,c\,x\,\mathrm{atan}\left(a\,x\right)}{2}}{a^{2}}+\frac{a^{2}\,c\,x^{4}\,\mathrm{atan}\left(a\,x\right)^{2}}{4}-\frac{a\,c\,x^{3}\,\mathrm{atan}\left(a\,x\right)}{6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^2*(c + a^2*c*x^2),x)
```

```
[Out] (c*(6*x^2*atan(a*x)^2 + x^2))/12 + ((c*(2*log(a^2*x^2 + 1) + 3*atan(a*x)^2)
)/12 - (a*c*x*atan(a*x))/2)/a^2 + (a^2*c*x^4*atan(a*x)^2)/4 - (a*c*x^3*atan
(a*x))/6
```

sympy [A] time = 1.13, size = 94, normalized size = 0.98

$$\begin{cases}\frac{a^{2}cx^{4}\operatorname{atan}^{2}\left(ax\right)}{4}-\frac{acx^{3}\operatorname{atan}\left(ax\right)}{6}+\frac{cx^{2}\operatorname{atan}^{2}\left(ax\right)}{2}+\frac{cx^{2}}{12}-\frac{cx\operatorname{atan}\left(ax\right)}{2a}+\frac{c\log\left(x^{2}+\frac{1}{a^{2}}\right)}{6a^{2}}+\frac{c\operatorname{atan}^{2}\left(ax\right)}{4a^{2}} & \text{for}\: a\neq 0\\0 & \text{otherwise}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)*atan(a*x)**2,x)
```

```
[Out] Piecewise((a**2*c*x**4*atan(a*x)**2/4 - a*c*x**3*atan(a*x)/6 + c*x**2*atan(
a*x)**2/2 + c*x**2/12 - c*x*atan(a*x)/(2*a) + c*log(x**2 + a**(-2))/(6*a**2
) + c*atan(a*x)**2/(4*a**2), Ne(a, 0)), (0, True))
```

3.261 $\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=128

$$\frac{1}{3}cx\left(a^2x^2+1\right)\tan^{-1}(ax)^2-\frac{c\left(a^2x^2+1\right)\tan^{-1}(ax)}{3a}+\frac{2ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{3a}+\frac{2ic\tan^{-1}(ax)^2}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^2+\frac{4c\log}{}$$

[Out] 1/3*c*x-1/3*c*(a^2*x^2+1)*arctan(a*x)/a+2/3*I*c*arctan(a*x)^2/a+2/3*c*x*arctan(a*x)^2+1/3*c*x*(a^2*x^2+1)*arctan(a*x)^2+4/3*c*arctan(a*x)*ln(2/(1+I*a*x))/a+2/3*I*c*polylog(2,1-2/(1+I*a*x))/a

Rubi [A] time = 0.10, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.412, Rules used = {4880, 4846, 4920, 4854, 2402, 2315, 8}

$$\frac{2ic\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{3a}+\frac{1}{3}cx\left(a^2x^2+1\right)\tan^{-1}(ax)^2-\frac{c\left(a^2x^2+1\right)\tan^{-1}(ax)}{3a}+\frac{2ic\tan^{-1}(ax)^2}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^2$$

Antiderivative was successfully verified.

[In] Int[(c + a^2*c*x^2)*ArcTan[a*x]^2,x]

[Out] (c*x)/3 - (c*(1 + a^2*x^2)*ArcTan[a*x])/(3*a) + (((2*I)/3)*c*ArcTan[a*x]^2)/a + (2*c*x*ArcTan[a*x]^2)/3 + (c*x*(1 + a^2*x^2)*ArcTan[a*x]^2)/3 + (4*c*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(3*a) + (((2*I)/3)*c*PolyLog[2, 1 - 2/(1 + I*a*x)])/a

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 - c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dist[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*ArcTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
```

```
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^2\,dx = -\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{3a}+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)^2+\frac{1}{3}c\int 1\,dx+\frac{1}{3}(2c)\int \tan^{-}$$
$$=\frac{cx}{3}-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^2+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)^2-\frac{1}{3}(4a$$
$$=\frac{cx}{3}-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{3a}+\frac{2ic\tan^{-1}(ax)^2}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^2+\frac{1}{3}cx\left(1+a^2x^2\right)$$
$$=\frac{cx}{3}-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{3a}+\frac{2ic\tan^{-1}(ax)^2}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^2+\frac{1}{3}cx\left(1+a^2x^2\right)$$
$$=\frac{cx}{3}-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{3a}+\frac{2ic\tan^{-1}(ax)^2}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^2+\frac{1}{3}cx\left(1+a^2x^2\right)$$
$$=\frac{cx}{3}-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{3a}+\frac{2ic\tan^{-1}(ax)^2}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^2+\frac{1}{3}cx\left(1+a^2x^2\right)$$

Mathematica [A] time = 0.05, size = 82, normalized size = 0.64

$$\frac{c\left(\left(a^3x^3+3ax-2i\right)\tan^{-1}(ax)^2-\tan^{-1}(ax)\left(a^2x^2-4\log\left(1+e^{2i\tan^{-1}(ax)}\right)+1\right)-2i\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)+ax\right)}{3a}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*(a*x + (-2*I + 3*a*x + a^3*x^3)*ArcTan[a*x]^2 - ArcTan[a*x]*(1 + a^2*x^2
 - 4*Log[1 + E^((2*I)*ArcTan[a*x])]) - (2*I)*PolyLog[2, -E^((2*I)*ArcTan[a*
x])]))/(3*a)
```

fricas [F] time = 1.28, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^2+c\right)\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.10, size = 233, normalized size = 1.82

$$\frac{a^2 c \arctan (ax)^2 x^3}{3}+cx \arctan (ax)^2-\frac{ac \arctan (ax) x^2}{3}-\frac{2c \arctan (ax) \ln \left(a^2x^2+1\right)}{3a}+\frac{cx}{3}-\frac{c \arctan (ax)}{3a}-\frac{ic \ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^2,x)
```

```
[Out] 1/3*a^2*c*arctan(a*x)^2*x^3+c*x*arctan(a*x)^2-1/3*a*c*arctan(a*x)*x^2-2/3/a
*c*arctan(a*x)*ln(a^2*x^2+1)+1/3*c*x-1/3/a*c*arctan(a*x)-1/3*I/a*c*ln(a*x-I
)*ln(a^2*x^2+1)+1/6*I/a*c*ln(a*x-I)^2+1/3*I/a*c*dilog(-1/2*I*(I+a*x))+1/3*I
/a*c*ln(a*x-I)*ln(-1/2*I*(I+a*x))+1/3*I/a*c*ln(I+a*x)*ln(a^2*x^2+1)-1/6*I/a
*c*ln(I+a*x)^2-1/3*I/a*c*dilog(1/2*I*(a*x-I))-1/3*I/a*c*ln(I+a*x)*ln(1/2*I*
(a*x-I))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$36\,a^4 c \int \frac{x^4 \arctan (ax)^2}{48\left(a^2x^2+1\right)}\,dx+3\,a^4 c \int \frac{x^4 \log \left(a^2x^2+1\right)^2}{48\left(a^2x^2+1\right)}\,dx+4\,a^4 c \int \frac{x^4 \log \left(a^2x^2+1\right)}{48\left(a^2x^2+1\right)}\,dx-8\,a^3 c \int \frac{x^3 \arctan (}{48\left(a^2x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 36*a^4*c*integrate(1/48*x^4*arctan(a*x)^2/(a^2*x^2 + 1), x) + 3*a^4*c*integ
rate(1/48*x^4*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 4*a^4*c*integrate(1/48
*x^4*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) - 8*a^3*c*integrate(1/48*x^3*arctan
(a*x)/(a^2*x^2 + 1), x) + 72*a^2*c*integrate(1/48*x^2*arctan(a*x)^2/(a^2*x^
2 + 1), x) + 6*a^2*c*integrate(1/48*x^2*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x
) + 12*a^2*c*integrate(1/48*x^2*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) + 1/12*(
a^2*c*x^3 + 3*c*x)*arctan(a*x)^2 + 1/4*c*arctan(a*x)^3/a - 24*a*c*integrate
(1/48*x*arctan(a*x)/(a^2*x^2 + 1), x) - 1/48*(a^2*c*x^3 + 3*c*x)*log(a^2*x^
2 + 1)^2 + 3*c*integrate(1/48*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2*(c + a^2*c*x^2),x)
```

```
[Out] int(atan(a*x)^2*(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int a^{2} x^{2} \operatorname{atan}^{2}{\left(a x \right)}\, dx + \int \operatorname{atan}^{2}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**2,x)
```

```
[Out] c*(Integral(a**2*x**2*atan(a*x)**2, x) + Integral(atan(a*x)**2, x))
```

3.262 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^2}{x}\,dx$

Optimal. Leaf size=169

$$\frac{1}{2}c\log\left(a^2x^2+1\right)+\frac{1}{2}a^2cx^2\tan^{-1}(ax)^2-\frac{1}{2}c\text{Li}_3\left(1-\frac{2}{iax+1}\right)+\frac{1}{2}c\text{Li}_3\left(\frac{2}{iax+1}-1\right)-ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)+$$

```
[Out] -a*c*x*arctan(a*x)+1/2*c*arctan(a*x)^2+1/2*a^2*c*x^2*arctan(a*x)^2-2*c*arct
an(a*x)^2*arctanh(-1+2/(1+I*a*x))+1/2*c*ln(a^2*x^2+1)-I*c*arctan(a*x)*polyl
og(2,1-2/(1+I*a*x))+I*c*arctan(a*x)*polylog(2,-1+2/(1+I*a*x))-1/2*c*polylog
(3,1-2/(1+I*a*x))+1/2*c*polylog(3,-1+2/(1+I*a*x))
```

Rubi [A] time = 0.31, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4850, 4988, 4884, 4994, 6610, 4852, 4916, 4846, 260}

$$-\frac{1}{2}c\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)+\frac{1}{2}c\text{PolyLog}\left(3,-1+\frac{2}{1+iax}\right)-ic\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+ic\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x,x]
```

```
[Out] -(a*c*x*ArcTan[a*x]) + (c*ArcTan[a*x]^2)/2 + (a^2*c*x^2*ArcTan[a*x]^2)/2 +
2*c*ArcTan[a*x]^2*ArcTanh[1 - 2/(1 + I*a*x)] + (c*Log[1 + a^2*x^2])/2 - I*c
*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)] + I*c*ArcTan[a*x]*PolyLog[2, -1
+ 2/(1 + I*a*x)] - (c*PolyLog[3, 1 - 2/(1 + I*a*x)])/2 + (c*PolyLog[3, -1 +
 2/(1 + I*a*x)])/2
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}{x}\,dx = c\int \frac{\tan^{-1}(ax)^2}{x}\,dx+\left(a^2c\right)\int x\tan^{-1}(ax)^2\,dx$$

$$= \frac{1}{2}a^2cx^2\tan^{-1}(ax)^2+2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{2}{1+iax}\right)-(4ac)\int \frac{\tan^{-1}(ax)\,\mathrm{t}}{1}$$

$$= \frac{1}{2}a^2cx^2\tan^{-1}(ax)^2+2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{2}{1+iax}\right)-(ac)\int \tan^{-1}(ax)\,dx$$

$$= -acx\tan^{-1}(ax)+\frac{1}{2}c\tan^{-1}(ax)^2+\frac{1}{2}a^2cx^2\tan^{-1}(ax)^2+2c\tan^{-1}(ax)^2\tanh^{-1}\Big($$

$$= -acx\tan^{-1}(ax)+\frac{1}{2}c\tan^{-1}(ax)^2+\frac{1}{2}a^2cx^2\tan^{-1}(ax)^2+2c\tan^{-1}(ax)^2\tanh^{-1}\Big($$

Mathematica [A] time = 0.05, size = 177, normalized size = 1.05

$$\frac{1}{2}c\log\left(a^2x^2+1\right)+\frac{1}{2}c\left(a^2x^2+1\right)\tan^{-1}(ax)^2+\frac{1}{2}c\mathrm{Li}_3\left(\frac{-ax-i}{ax-i}\right)-\frac{1}{2}c\mathrm{Li}_3\left(\frac{ax+i}{ax-i}\right)+ic\mathrm{Li}_2\left(\frac{-ax-i}{ax-i}\right)\tan^{-1}(ax)-ic\mathrm{Li}_2\left(\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x,x]
```

```
[Out] -(a*c*x*ArcTan[a*x]) + (c*(1 + a^2*x^2)*ArcTan[a*x]^2)/2 + 2*c*ArcTan[a*x]^
2*ArcTanh[1 - (2*I)/(I - a*x)] + (c*Log[1 + a^2*x^2])/2 + I*c*ArcTan[a*x]*P
olyLog[2, (-I - a*x)/(-I + a*x)] - I*c*ArcTan[a*x]*PolyLog[2, (I + a*x)/(-I
 + a*x)] + (c*PolyLog[3, (-I - a*x)/(-I + a*x)])/2 - (c*PolyLog[3, (I + a*x
)/(-I + a*x)])/2
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^2cx^2+c\right)\arctan\left(ax\right)^2}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^2/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 3.75, size = 1078, normalized size = 6.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^2/x,x)
```

```
[Out] 1/2*a^2*c*x^2*arctan(a*x)^2+c*arctan(a*x)^2*ln(a*x)-c*arctan(a*x)^2*ln((1+I
*a*x)^2/(a^2*x^2+1)-1)+c*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/
2*I*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*cs
gn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2
+2*c*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+c*arctan(a*x)^2*ln(1-(1+I*a*x)
/(a^2*x^2+1)^(1/2))+I*c*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+2*c
*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-a*c*x*arctan(a*x)+1/2*I*c*Pi*csgn(I
*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2
/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2-1/2*c*polylog(3,
-(1+I*a*x)^2/(a^2*x^2+1))-c*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+1/2*I*c*Pi*csgn(I
*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((
1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2-2*I*c*
arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*c*arctan(a*x)*polylo
g(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/2*I*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1
)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arc
tan(a*x)^2-1/2*I*c*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)
^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+1/2*I*c*Pi*a
rctan(a*x)^2+1/2*I*c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*
```

```
x^2+1)+1))^3*arctan(a*x)^2+I*c*arctan(a*x)+1/2*c*arctan(a*x)^2-1/2*I*c*Pi*c
sgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^
2+1/2*I*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
)^3*arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}\,a^2cx^2\arctan\left(ax\right)^2-\frac{1}{32}\,a^2cx^2\log\left(a^2x^2+1\right)^2+12\,a^4c\int\frac{x^4\arctan\left(ax\right)^2}{16\left(a^2x^3+x\right)}\,dx+a^4c\int\frac{x^4\log\left(a^2x^2+1\right)^2}{16\left(a^2x^3+x\right)}\,dx+2\,a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x,x, algorithm="maxima")
```

```
[Out] 1/8*a^2*c*x^2*arctan(a*x)^2 - 1/32*a^2*c*x^2*log(a^2*x^2 + 1)^2 + 12*a^4*c*
integrate(1/16*x^4*arctan(a*x)^2/(a^2*x^3 + x), x) + a^4*c*integrate(1/16*x
^4*log(a^2*x^2 + 1)^2/(a^2*x^3 + x), x) + 2*a^4*c*integrate(1/16*x^4*log(a^
2*x^2 + 1)/(a^2*x^3 + x), x) - 4*a^3*c*integrate(1/16*x^3*arctan(a*x)/(a^2*
x^3 + x), x) + 24*a^2*c*integrate(1/16*x^2*arctan(a*x)^2/(a^2*x^3 + x), x)
+ 1/48*c*log(a^2*x^2 + 1)^3 + 12*c*integrate(1/16*arctan(a*x)^2/(a^2*x^3 +
x), x) + c*integrate(1/16*log(a^2*x^2 + 1)^2/(a^2*x^3 + x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2))/x,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int\frac{\operatorname{atan}^2\left(ax\right)}{x}\,dx+\int a^2x\operatorname{atan}^2\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**2/x,x)
```

```
[Out] c*(Integral(atan(a*x)**2/x, x) + Integral(a**2*x*atan(a*x)**2, x))
```

3.263 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^2}{x^2}\,dx$

Optimal. Leaf size=113

$$a^2cx\tan^{-1}(ax)^2 - iac\text{Li}_2\left(\frac{2}{1-iax}-1\right) + iac\text{Li}_2\left(1-\frac{2}{iax+1}\right) - \frac{c\tan^{-1}(ax)^2}{x} + 2ac\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax) + 2ac\log\left(\right.$$

```
[Out] -c*arctan(a*x)^2/x+a^2*c*x*arctan(a*x)^2+2*a*c*arctan(a*x)*ln(2/(1+I*a*x))+
2*a*c*arctan(a*x)*ln(2-2/(1-I*a*x))-I*a*c*polylog(2,-1+2/(1-I*a*x))+I*a*c*p
olylog(2,1-2/(1+I*a*x))
```

Rubi [A] time = 0.22, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4852, 4924, 4868, 2447, 4846, 4920, 4854, 2402, 2315}

$$-iac\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right) + iac\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right) + a^2cx\tan^{-1}(ax)^2 - \frac{c\tan^{-1}(ax)^2}{x} + 2ac\log\left(\frac{2}{1+iax}\right)\text{t}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] -((c*ArcTan[a*x]^2)/x) + a^2*c*x*ArcTan[a*x]^2 + 2*a*c*ArcTan[a*x]*Log[2/(1
 + I*a*x)] + 2*a*c*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)] - I*a*c*PolyLog[2, -1
 + 2/(1 - I*a*x)] + I*a*c*PolyLog[2, 1 - 2/(1 + I*a*x)]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}{x^2}\,dx = c\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx + \left(a^2c\right)\int \tan^{-1}(ax)^2\,dx$$

$$= -\frac{c\tan^{-1}(ax)^2}{x} + a^2cx\tan^{-1}(ax)^2 + (2ac)\int \frac{\tan^{-1}(ax)}{x\left(1+a^2x^2\right)}\,dx - \left(2a^3c\right)\int \frac{x\tan^{-1}}{1+a}$$

$$= -\frac{c\tan^{-1}(ax)^2}{x} + a^2cx\tan^{-1}(ax)^2 + (2iac)\int \frac{\tan^{-1}(ax)}{x(i+ax)}\,dx + \left(2a^2c\right)\int \frac{\tan^{-1}(a}{i-ax}$$

$$= -\frac{c\tan^{-1}(ax)^2}{x} + a^2cx\tan^{-1}(ax)^2 + 2ac\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right) + 2ac\tan^{-1}(ax$$

$$= -\frac{c\tan^{-1}(ax)^2}{x} + a^2cx\tan^{-1}(ax)^2 + 2ac\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right) + 2ac\tan^{-1}(ax$$

$$= -\frac{c\tan^{-1}(ax)^2}{x} + a^2cx\tan^{-1}(ax)^2 + 2ac\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right) + 2ac\tan^{-1}(ax$$

Mathematica [A] time = 0.16, size = 94, normalized size = 0.83

$$c\left(-ia\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)-ia\text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)+\frac{(ax-i)^2\tan^{-1}(ax)^2}{x}+2a\tan^{-1}(ax)\left(\log\left(1-e^{2i\tan^{-1}(ax)}\right)+\log\left(1-\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] c*(((-I + a*x)^2*ArcTan[a*x]^2)/x + 2*a*ArcTan[a*x]*(Log[1 - E^((2*I)*ArcTa
n[a*x])] + Log[1 + E^((2*I)*ArcTan[a*x])]) - I*a*PolyLog[2, -E^((2*I)*ArcTa
n[a*x])] - I*a*PolyLog[2, E^((2*I)*ArcTan[a*x])])
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)\arctan\left(ax\right)^2}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^2/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.13, size = 262, normalized size = 2.32

$$a^2cx\arctan\left(ax\right)^2-\frac{c\arctan\left(ax\right)^2}{x}+2ac\arctan\left(ax\right)\ln\left(ax\right)-2ac\arctan\left(ax\right)\ln\left(a^2x^2+1\right)+iac\ln\left(ax-i\right)\ln\left(-\frac{i\left(ax\right.}{2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^2/x^2,x)
```

```
[Out] a^2*c*x*arctan(a*x)^2-c*arctan(a*x)^2/x+2*a*c*arctan(a*x)*ln(a*x)-2*a*c*arc
tan(a*x)*ln(a^2*x^2+1)+I*a*c*ln(a*x-I)*ln(-1/2*I*(I+a*x))-I*a*c*ln(I+a*x)*l
n(1/2*I*(a*x-I))+1/2*I*a*c*ln(a*x-I)^2+I*a*c*ln(I+a*x)*ln(a^2*x^2+1)-I*a*c*
ln(a*x-I)*ln(a^2*x^2+1)-I*a*c*ln(a*x)*ln(1-I*a*x)-I*a*c*dilog(1/2*I*(a*x-I)
)-I*a*c*dilog(1-I*a*x)+I*a*c*ln(a*x)*ln(1+I*a*x)-1/2*I*a*c*ln(I+a*x)^2+I*a*
c*dilog(-1/2*I*(I+a*x))+I*a*c*dilog(1+I*a*x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2))/x^2,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int a^2\operatorname{atan}^2(ax)\,dx+\int\frac{\operatorname{atan}^2(ax)}{x^2}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**2/x**2,x)
```

```
[Out] c*(Integral(a**2*atan(a*x)**2, x) + Integral(atan(a*x)**2/x**2, x))
```

3.264 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^2}{x^3}\,dx$

Optimal. Leaf size=196

$$-\frac{1}{2}a^2c\text{Li}_3\left(1-\frac{2}{iax+1}\right)+\frac{1}{2}a^2c\text{Li}_3\left(\frac{2}{iax+1}-1\right)-ia^2c\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)+ia^2c\text{Li}_2\left(\frac{2}{iax+1}-1\right)\tan^{-1}(ax)$$

```
[Out] -a*c*arctan(a*x)/x-1/2*a^2*c*arctan(a*x)^2-1/2*c*arctan(a*x)^2/x^2-2*a^2*c*
arctan(a*x)^2*arctanh(-1+2/(1+I*a*x))+a^2*c*ln(x)-1/2*a^2*c*ln(a^2*x^2+1)-I
*a^2*c*arctan(a*x)*polylog(2,1-2/(1+I*a*x))+I*a^2*c*arctan(a*x)*polylog(2,-
1+2/(1+I*a*x))-1/2*a^2*c*polylog(3,1-2/(1+I*a*x))+1/2*a^2*c*polylog(3,-1+2/
(1+I*a*x))
```

Rubi [A] time = 0.33, antiderivative size = 196, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 12, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4950, 4852, 4918, 266, 36, 29, 31, 4884, 4850, 4988, 4994, 6610}

$$-\frac{1}{2}a^2c\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)+\frac{1}{2}a^2c\text{PolyLog}\left(3,-1+\frac{2}{1+iax}\right)-ia^2c\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+ia^2c\,\text{t}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] -((a*c*ArcTan[a*x])/x) - (a^2*c*ArcTan[a*x]^2)/2 - (c*ArcTan[a*x]^2)/(2*x^2
) + 2*a^2*c*ArcTan[a*x]^2*ArcTanh[1 - 2/(1 + I*a*x)] + a^2*c*Log[x] - (a^2*
c*Log[1 + a^2*x^2])/2 - I*a^2*c*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)] +
 I*a^2*c*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 + I*a*x)] - (a^2*c*PolyLog[3, 1 -
 2/(1 + I*a*x)])/2 + (a^2*c*PolyLog[3, -1 + 2/(1 + I*a*x)])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}{x^3}\,dx = c\int \frac{\tan^{-1}(ax)^2}{x^3}\,dx + \left(a^2c\right)\int \frac{\tan^{-1}(ax)^2}{x}\,dx$$
$$= -\frac{c\tan^{-1}(ax)^2}{2x^2} + 2a^2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{2}{1+iax}\right) + (ac)\int \frac{\tan^{-1}(ax)}{x^2\left(1+a^2x^2\right)}\,dx$$
$$= -\frac{c\tan^{-1}(ax)^2}{2x^2} + 2a^2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{2}{1+iax}\right) + (ac)\int \frac{\tan^{-1}(ax)}{x^2}\,dx - (a$$
$$= -\frac{ac\tan^{-1}(ax)}{x} - \frac{1}{2}a^2c\tan^{-1}(ax)^2 - \frac{c\tan^{-1}(ax)^2}{2x^2} + 2a^2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{}{1}\right.$$
$$= -\frac{ac\tan^{-1}(ax)}{x} - \frac{1}{2}a^2c\tan^{-1}(ax)^2 - \frac{c\tan^{-1}(ax)^2}{2x^2} + 2a^2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{}{1}\right.$$
$$= -\frac{ac\tan^{-1}(ax)}{x} - \frac{1}{2}a^2c\tan^{-1}(ax)^2 - \frac{c\tan^{-1}(ax)^2}{2x^2} + 2a^2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{}{1}\right.$$
$$= -\frac{ac\tan^{-1}(ax)}{x} - \frac{1}{2}a^2c\tan^{-1}(ax)^2 - \frac{c\tan^{-1}(ax)^2}{2x^2} + 2a^2c\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{}{1}\right.$$

Mathematica [A] time = 0.09, size = 208, normalized size = 1.06

$$\frac{1}{2}a^2c\text{Li}_3\left(\frac{-ax-i}{ax-i}\right)-\frac{1}{2}a^2c\text{Li}_3\left(\frac{ax+i}{ax-i}\right)+ia^2c\text{Li}_2\left(\frac{-ax-i}{ax-i}\right)\tan^{-1}(ax)-ia^2c\text{Li}_2\left(\frac{ax+i}{ax-i}\right)\tan^{-1}(ax)-\frac{1}{2}a^2c\log\left(a^2x^2+\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] -((a*c*ArcTan[a*x])/x) + (c*(-1 - a^2*x^2)*ArcTan[a*x]^2)/(2*x^2) + 2*a^2*c
*ArcTan[a*x]^2*ArcTanh[1 - (2*I)/(I - a*x)] + a^2*c*Log[x] - (a^2*c*Log[1 +
 a^2*x^2])/2 + I*a^2*c*ArcTan[a*x]*PolyLog[2, (-I - a*x)/(-I + a*x)] - I*a^
2*c*ArcTan[a*x]*PolyLog[2, (I + a*x)/(-I + a*x)] + (a^2*c*PolyLog[3, (-I -
a*x)/(-I + a*x)])/2 - (a^2*c*PolyLog[3, (I + a*x)/(-I + a*x)])/2
```

fricas [F] time = 0.71, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)\arctan\left(ax\right)^2}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^2/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 6.32, size = 1167, normalized size = 5.95

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^2/x^3,x)
```

```
[Out] a^2*c*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)+a^2*c*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1
/2))+2*a^2*c*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*a^2*c*polylog(3,(1+I
*a*x)/(a^2*x^2+1)^(1/2))-1/2*a^2*c*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))+a^2*
c*arctan(a*x)^2*ln(a*x)-a^2*c*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+a
^2*c*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+a^2*c*arctan(a*x)^2*ln
(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*a^2*c*arctan(a*x)-a*c*arctan(a*x)/x-1/2*a
^2*c*arctan(a*x)^2-1/2*c*arctan(a*x)^2/x^2-1/2*I*a^2*c*Pi*csgn(I*((1+I*a*x)
^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2
+1)+1))^2*arctan(a*x)^2-1/2*I*a^2*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/(
(1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(
a^2*x^2+1)+1))^2*arctan(a*x)^2-1/2*I*a^2*c*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+
1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*ar
ctan(a*x)^2+1/2*I*a^2*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/
(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1
))*arctan(a*x)^2-1/2*I*a^2*c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)
^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+1/2*I*a^2*c*Pi*csgn(((1+I*a*x)^2/(a^2*x^
2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*arctan(a*x)^2+1/2*I*a^2*c*Pi*csgn(I*
((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*arctan(a*x)^2+I*
a^2*c*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+1/2*I*a^2*c*Pi*arctan
(a*x)^2-2*I*a^2*c*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*a^
2*c*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/2*I*a^2*c*Pi*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*
((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\Big(72\,a^4c\int\frac{x^4\arctan(ax)^2}{a^2x^5+x^3}\,dx + a^2c\log\left(a^2x^2+1\right)^3 - 3\Big(a^2\Big(\frac{\log\left(a^2x^2+1\right)^2}{a^2} - \frac{2\left(2\log\left(a^2x^2+1\right)\log(x)+\mathrm{Li}_2\left(-a^2x^2\right)\right)}{a^2}\Big) - 2\Big(\log\Big(a^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/96*((1152*a^4*c*integrate(1/16*x^4*arctan(a*x)^2/(a^2*x^5 + x^3), x) + a^
2*c*log(a^2*x^2 + 1)^3 + 2304*a^2*c*integrate(1/16*x^2*arctan(a*x)^2/(a^2*x
^5 + x^3), x) + 192*a^2*c*integrate(1/16*x^2*log(a^2*x^2 + 1)^2/(a^2*x^5 +
x^3), x) - 192*a^2*c*integrate(1/16*x^2*log(a^2*x^2 + 1)/(a^2*x^5 + x^3), x
) + 384*a*c*integrate(1/16*x*arctan(a*x)/(a^2*x^5 + x^3), x) + 1152*c*integ
rate(1/16*arctan(a*x)^2/(a^2*x^5 + x^3), x) + 96*c*integrate(1/16*log(a^2*x
^2 + 1)^2/(a^2*x^5 + x^3), x))*x^2 - 12*c*arctan(a*x)^2 + 3*c*log(a^2*x^2 +
 1)^2)/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2))/x^3,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{\operatorname{atan}^{2}{\left(a x \right)}}{x^{3}}\, dx + \int \frac{a^{2} \operatorname{atan}^{2}{\left(a x \right)}}{x}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**2/x**3,x)
```

```
[Out] c*(Integral(atan(a*x)**2/x**3, x) + Integral(a**2*atan(a*x)**2/x, x))
```

3.265 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^2}{x^4}\,dx$

Optimal. Leaf size=135

$$-\frac{2}{3}ia^3c\text{Li}_2\left(\frac{2}{1-iax}-1\right)-\frac{2}{3}ia^3c\tan^{-1}(ax)^2-\frac{1}{3}a^3c\tan^{-1}(ax)+\frac{4}{3}a^3c\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)-\frac{a^2c}{3x}-\frac{a^2c\tan^{-1}}{x}$$

```
[Out] -1/3*a^2*c/x-1/3*a^3*c*arctan(a*x)-1/3*a*c*arctan(a*x)/x^2-2/3*I*a^3*c*arct
an(a*x)^2-1/3*c*arctan(a*x)^2/x^3-a^2*c*arctan(a*x)^2/x+4/3*a^3*c*arctan(a*
x)*ln(2-2/(1-I*a*x))-2/3*I*a^3*c*polylog(2,-1+2/(1-I*a*x))
```

Rubi [A] time = 0.31, antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4950, 4852, 4918, 325, 203, 4924, 4868, 2447}

$$-\frac{2}{3}ia^3c\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{a^2c}{3x}-\frac{2}{3}ia^3c\tan^{-1}(ax)^2-\frac{1}{3}a^3c\tan^{-1}(ax)-\frac{a^2c\tan^{-1}(ax)^2}{x}+\frac{4}{3}a^3c\log\left(2-\frac{2}{1-}\right.$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -(a^2*c)/(3*x) - (a^3*c*ArcTan[a*x])/3 - (a*c*ArcTan[a*x])/(3*x^2) - ((2*I)
/3)*a^3*c*ArcTan[a*x]^2 - (c*ArcTan[a*x]^2)/(3*x^3) - (a^2*c*ArcTan[a*x]^2)
/x + (4*a^3*c*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/3 - ((2*I)/3)*a^3*c*PolyL
og[2, -1 + 2/(1 - I*a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
```

```
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}{x^4}\,dx &= c\int \frac{\tan^{-1}(ax)^2}{x^4}\,dx+\left(a^2c\right)\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx\\
&= -\frac{c\tan^{-1}(ax)^2}{3x^3}-\frac{a^2c\tan^{-1}(ax)^2}{x}+\frac{1}{3}(2ac)\int \frac{\tan^{-1}(ax)}{x^3\left(1+a^2x^2\right)}\,dx+\left(2a^3c\right)\int \frac{\tan^{-1}(}{x\left(1+a\right.}\\
&= -ia^3c\tan^{-1}(ax)^2-\frac{c\tan^{-1}(ax)^2}{3x^3}-\frac{a^2c\tan^{-1}(ax)^2}{x}+\frac{1}{3}(2ac)\int \frac{\tan^{-1}(ax)}{x^3}\,dx+\left(2i\right.\\
&= -\frac{ac\tan^{-1}(ax)}{3x^2}-\frac{2}{3}ia^3c\tan^{-1}(ax)^2-\frac{c\tan^{-1}(ax)^2}{3x^3}-\frac{a^2c\tan^{-1}(ax)^2}{x}+2a^3c\tan^{-1}(\\
&= -\frac{a^2c}{3x}-\frac{ac\tan^{-1}(ax)}{3x^2}-\frac{2}{3}ia^3c\tan^{-1}(ax)^2-\frac{c\tan^{-1}(ax)^2}{3x^3}-\frac{a^2c\tan^{-1}(ax)^2}{x}+\frac{4}{3}a^3c\\
&= -\frac{a^2c}{3x}-\frac{1}{3}a^3c\tan^{-1}(ax)-\frac{ac\tan^{-1}(ax)}{3x^2}-\frac{2}{3}ia^3c\tan^{-1}(ax)^2-\frac{c\tan^{-1}(ax)^2}{3x^3}-\frac{a^2c\,\mathrm{ta}}{}
\end{aligned}$$

Mathematica [A] time = 0.63, size = 103, normalized size = 0.76

$$\frac{c\left(-2ia^3x^3\mathrm{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)-a^2x^2+ax\tan^{-1}(ax)\left(-a^2x^2+4a^2x^2\log\left(1-e^{2i\tan^{-1}(ax)}\right)-1\right)+(1-2iax)(ax-i)^2\,\mathrm{ta}}{3x^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] (c*(-(a^2*x^2) + (1 - (2*I)*a*x)*(-I + a*x)^2*ArcTan[a*x]^2 + a*x*ArcTan[a*
x]*(-1 - a^2*x^2 + 4*a^2*x^2*Log[1 - E^((2*I)*ArcTan[a*x])]) - (2*I)*a^3*x^
3*PolyLog[2, E^((2*I)*ArcTan[a*x])]))/(3*x^3)
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)\arctan\left(ax\right)^2}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^4,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^2/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^4,x, algorithm="giac")
[Out] Timed out
```

maple [B] time = 0.11, size = 323, normalized size = 2.39

$$-\frac{c\arctan\left(ax\right)^2}{3x^3}-\frac{a^2c\arctan\left(ax\right)^2}{x}-\frac{ac\arctan\left(ax\right)}{3x^2}+\frac{4a^3c\arctan\left(ax\right)\ln\left(ax\right)}{3}-\frac{2a^3c\arctan\left(ax\right)\ln\left(a^2x^2+1\right)}{3}-\frac{a}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^2/x^4,x)
[Out] -1/3*c*arctan(a*x)^2/x^3-a^2*c*arctan(a*x)^2/x-1/3*a*c*arctan(a*x)/x^2+4/3*
a^3*c*arctan(a*x)*ln(a*x)-2/3*a^3*c*arctan(a*x)*ln(a^2*x^2+1)-1/3*a^2*c/x-1
/3*a^3*c*arctan(a*x)+2/3*I*a^3*c*ln(a*x)*ln(1+I*a*x)+1/3*I*a^3*c*ln(a*x-I)*
ln(-1/2*I*(I+a*x))+1/6*I*a^3*c*ln(a*x-I)^2-1/3*I*a^3*c*ln(a*x-I)*ln(a^2*x^2
+1)-1/3*I*a^3*c*ln(I+a*x)*ln(1/2*I*(a*x-I))-1/6*I*a^3*c*ln(I+a*x)^2+2/3*I*a
^3*c*dilog(1+I*a*x)-1/3*I*a^3*c*dilog(1/2*I*(a*x-I))+1/3*I*a^3*c*dilog(-1/2
*I*(I+a*x))+1/3*I*a^3*c*ln(I+a*x)*ln(a^2*x^2+1)-2/3*I*a^3*c*dilog(1-I*a*x)-
2/3*I*a^3*c*ln(a*x)*ln(1-I*a*x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^2/x^4,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2))/x^4,x)
[Out] int((atan(a*x)^2*(c + a^2*c*x^2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{\operatorname{atan}^{2}(ax)}{x^{4}}\,dx+\int \frac{a^{2}\operatorname{atan}^{2}(ax)}{x^{2}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**2/x**4,x)
```

```
[Out] c*(Integral(atan(a*x)**2/x**4, x) + Integral(a**2*atan(a*x)**2/x**2, x))
```

3.266 $\int x^3 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=191

$$\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^2-\frac{c^2\tan^{-1}(ax)^2}{24a^4}-\frac{1}{28}a^3c^2x^7\tan^{-1}(ax)+\frac{c^2x\tan^{-1}(ax)}{12a^3}+\frac{1}{168}a^2c^2x^6+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)^2-\frac{5c^2}{504}$$

```
[Out] -5/504*c^2*x^2/a^2+1/84*c^2*x^4+1/168*a^2*c^2*x^6+1/12*c^2*x*arctan(a*x)/a^
3-1/36*c^2*x^3*arctan(a*x)/a-1/12*a*c^2*x^5*arctan(a*x)-1/28*a^3*c^2*x^7*ar
ctan(a*x)-1/24*c^2*arctan(a*x)^2/a^4+1/4*c^2*x^4*arctan(a*x)^2+1/3*a^2*c^2*
x^6*arctan(a*x)^2+1/8*a^4*c^2*x^8*arctan(a*x)^2-2/63*c^2*ln(a^2*x^2+1)/a^4
```

Rubi [A] time = 0.79, antiderivative size = 191, normalized size of antiderivative = 1.00, number of steps used = 47, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4948, 4852, 4916, 266, 43, 4846, 260, 4884}

$$\frac{1}{168}a^2c^2x^6-\frac{5c^2x^2}{504a^2}-\frac{2c^2\log\left(a^2x^2+1\right)}{63a^4}+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^2-\frac{1}{28}a^3c^2x^7\tan^{-1}(ax)+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)^2+\frac{c^2x\tan}{12}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
```

```
[Out] (-5*c^2*x^2)/(504*a^2) + (c^2*x^4)/84 + (a^2*c^2*x^6)/168 + (c^2*x*ArcTan[a
*x])/(12*a^3) - (c^2*x^3*ArcTan[a*x])/(36*a) - (a*c^2*x^5*ArcTan[a*x])/12 -
 (a^3*c^2*x^7*ArcTan[a*x])/28 - (c^2*ArcTan[a*x]^2)/(24*a^4) + (c^2*x^4*Arc
Tan[a*x]^2)/4 + (a^2*c^2*x^6*ArcTan[a*x]^2)/3 + (a^4*c^2*x^8*ArcTan[a*x]^2)
/8 - (2*c^2*Log[1 + a^2*x^2])/(63*a^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
```

```
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\begin{aligned}
\int x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2\,dx &= \int\left(c^2x^3\tan^{-1}(ax)^2+2a^2c^2x^5\tan^{-1}(ax)^2+a^4c^2x^7\tan^{-1}(ax)^2\right)dx\\
&= c^2\int x^3\tan^{-1}(ax)^2\,dx+\left(2a^2c^2\right)\int x^5\tan^{-1}(ax)^2\,dx+\left(a^4c^2\right)\int x^7\tan^{-1}(ax)^2\\
&= \frac{1}{4}c^2x^4\tan^{-1}(ax)^2+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)^2+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^2-\frac{1}{2}\left(ac^2\right)\int\frac{x^4}{1}\\
&= \frac{1}{4}c^2x^4\tan^{-1}(ax)^2+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)^2+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^2-\frac{c^2\int x^2\tan^{-1}(}{2a}\\
&= -\frac{c^2x^3\tan^{-1}(ax)}{6a}-\frac{2}{15}ac^2x^5\tan^{-1}(ax)-\frac{1}{28}a^3c^2x^7\tan^{-1}(ax)+\frac{1}{4}c^2x^4\tan^{-1}(ax\\
&= \frac{c^2x\tan^{-1}(ax)}{2a^3}+\frac{c^2x^3\tan^{-1}(ax)}{18a}-\frac{1}{12}ac^2x^5\tan^{-1}(ax)-\frac{1}{28}a^3c^2x^7\tan^{-1}(ax)-\\
&= -\frac{c^2x\tan^{-1}(ax)}{6a^3}-\frac{c^2x^3\tan^{-1}(ax)}{36a}-\frac{1}{12}ac^2x^5\tan^{-1}(ax)-\frac{1}{28}a^3c^2x^7\tan^{-1}(ax)+\\
&= \frac{29c^2x^2}{840a^2}+\frac{41c^2x^4}{1680}+\frac{1}{168}a^2c^2x^6+\frac{c^2x\tan^{-1}(ax)}{12a^3}-\frac{c^2x^3\tan^{-1}(ax)}{36a}-\frac{1}{12}ac^2x^5\tan\\
&= -\frac{13c^2x^2}{252a^2}+\frac{c^2x^4}{84}+\frac{1}{168}a^2c^2x^6+\frac{c^2x\tan^{-1}(ax)}{12a^3}-\frac{c^2x^3\tan^{-1}(ax)}{36a}-\frac{1}{12}ac^2x^5\tan\\
&= -\frac{5c^2x^2}{504a^2}+\frac{c^2x^4}{84}+\frac{1}{168}a^2c^2x^6+\frac{c^2x\tan^{-1}(ax)}{12a^3}-\frac{c^2x^3\tan^{-1}(ax)}{36a}-\frac{1}{12}ac^2x^5\tan
\end{aligned}$$

Mathematica [A] time = 0.08, size = 110, normalized size = 0.58

$$\frac{c^2\left(3a^6x^6+6a^4x^4-5a^2x^2-16\log\left(a^2x^2+1\right)+21\left(a^2x^2+1\right)^3\left(3a^2x^2-1\right)\tan^{-1}(ax)^2-2ax\left(9a^6x^6+21a^4x^4+7\right.\right.}{504a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
```

```
[Out] (c^2*(-5*a^2*x^2 + 6*a^4*x^4 + 3*a^6*x^6 - 2*a*x*(-21 + 7*a^2*x^2 + 21*a^4*
x^4 + 9*a^6*x^6)*ArcTan[a*x] + 21*(1 + a^2*x^2)^3*(-1 + 3*a^2*x^2)*ArcTan[a
*x]^2 - 16*Log[1 + a^2*x^2]))/(504*a^4)
```

fricas [A] time = 0.63, size = 148, normalized size = 0.77

$$\frac{3\,a^6c^2x^6 + 6\,a^4c^2x^4 - 5\,a^2c^2x^2 + 21\left(3\,a^8c^2x^8 + 8\,a^6c^2x^6 + 6\,a^4c^2x^4 - c^2\right)\arctan\left(ax\right)^2 - 16\,c^2\log\left(a^2x^2 + 1\right) -}{504\,a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/504*(3*a^6*c^2*x^6 + 6*a^4*c^2*x^4 - 5*a^2*c^2*x^2 + 21*(3*a^8*c^2*x^8 +
8*a^6*c^2*x^6 + 6*a^4*c^2*x^4 - c^2)*arctan(a*x)^2 - 16*c^2*log(a^2*x^2 + 1
) - 2*(9*a^7*c^2*x^7 + 21*a^5*c^2*x^5 + 7*a^3*c^2*x^3 - 21*a*c^2*x)*arctan(
a*x))/a^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 168, normalized size = 0.88

$$-\frac{5c^2x^2}{504a^2}+\frac{c^2x^4}{84}+\frac{a^2c^2x^6}{168}+\frac{c^2x\arctan\left(ax\right)}{12a^3}-\frac{c^2x^3\arctan\left(ax\right)}{36a}-\frac{a\,c^2x^5\arctan\left(ax\right)}{12}-\frac{a^3c^2x^7\arctan\left(ax\right)}{28}-\frac{c^2\arctan}{24a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^2,x)
```

```
[Out] -5/504*c^2*x^2/a^2+1/84*c^2*x^4+1/168*a^2*c^2*x^6+1/12*c^2*x*arctan(a*x)/a^
3-1/36*c^2*x^3*arctan(a*x)/a-1/12*a*c^2*x^5*arctan(a*x)-1/28*a^3*c^2*x^7*ar
ctan(a*x)-1/24*c^2*arctan(a*x)^2/a^4+1/4*c^2*x^4*arctan(a*x)^2+1/3*a^2*c^2*
x^6*arctan(a*x)^2+1/8*a^4*c^2*x^8*arctan(a*x)^2-2/63*c^2*ln(a^2*x^2+1)/a^4
```

maxima [A] time = 0.43, size = 169, normalized size = 0.88

$$-\frac{1}{252}\,a\left(\frac{21\,c^2\arctan\left(ax\right)}{a^5}+\frac{9\,a^6c^2x^7 + 21\,a^4c^2x^5 + 7\,a^2c^2x^3 - 21\,c^2x}{a^4}\right)\arctan\left(ax\right)+\frac{1}{24}\left(3\,a^4c^2x^8 + 8\,a^2c^2x^6 + 6\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -1/252*a*(21*c^2*arctan(a*x)/a^5 + (9*a^6*c^2*x^7 + 21*a^4*c^2*x^5 + 7*a^2*
c^2*x^3 - 21*c^2*x)/a^4)*arctan(a*x) + 1/24*(3*a^4*c^2*x^8 + 8*a^2*c^2*x^6
+ 6*c^2*x^4)*arctan(a*x)^2 + 1/504*(3*a^6*c^2*x^6 + 6*a^4*c^2*x^4 - 5*a^2*c
^2*x^2 + 21*c^2*arctan(a*x)^2 - 16*c^2*log(a^2*x^2 + 1))/a^4
```

mupad [B] time = 0.54, size = 145, normalized size = 0.76

$$\mathrm{atan}\left(a\,x\right)^2\left(\frac{c^2\,x^4}{4}-\frac{c^2}{24\,a^4}+\frac{a^2\,c^2\,x^6}{3}+\frac{a^4\,c^2\,x^8}{8}\right)+\frac{c^2\,x^4}{84}-a^2\,\mathrm{atan}\left(a\,x\right)\left(\frac{a\,c^2\,x^7}{28}-\frac{c^2\,x}{12\,a^5}+\frac{c^2\,x^5}{12\,a}+\frac{c^2\,x^3}{36\,a^3}\right)-\frac{2\,c^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^2,x)
```

```
[Out] atan(a*x)^2*((c^2*x^4)/4 - c^2/(24*a^4) + (a^2*c^2*x^6)/3 + (a^4*c^2*x^8)/8
) + (c^2*x^4)/84 - a^2*atan(a*x)*((a*c^2*x^7)/28 - (c^2*x)/(12*a^5) + (c^2*
x^5)/(12*a) + (c^2*x^3)/(36*a^3)) - (2*c^2*log(a^2*x^2 + 1))/(63*a^4) - (5*
c^2*x^2)/(504*a^2) + (a^2*c^2*x^6)/168
```

sympy [A] time = 3.29, size = 185, normalized size = 0.97

$$\begin{cases} \frac{a^4c^2x^8\,\mathrm{atan}^2\,(ax)}{8} - \frac{a^3c^2x^7\,\mathrm{atan}\,(ax)}{28} + \frac{a^2c^2x^6\,\mathrm{atan}^2\,(ax)}{3} + \frac{a^2c^2x^6}{168} - \frac{ac^2x^5\,\mathrm{atan}\,(ax)}{12} + \frac{c^2x^4\,\mathrm{atan}^2\,(ax)}{4} + \frac{c^2x^4}{84} - \frac{c^2x^3\,\mathrm{atan}\,(ax)}{36a} - \frac{5c^2x^2}{504a^2} + \\ 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**2*atan(a*x)**2,x)
```

```
[Out] Piecewise((a**4*c**2*x**8*atan(a*x)**2/8 - a**3*c**2*x**7*atan(a*x)/28 + a*
*2*c**2*x**6*atan(a*x)**2/3 + a**2*c**2*x**6/168 - a*c**2*x**5*atan(a*x)/12
 + c**2*x**4*atan(a*x)**2/4 + c**2*x**4/84 - c**2*x**3*atan(a*x)/(36*a) - 5
*c**2*x**2/(504*a**2) + c**2*x*atan(a*x)/(12*a**3) - 2*c**2*log(x**2 + a**(
-2))/(63*a**4) - c**2*atan(a*x)**2/(24*a**4), Ne(a, 0)), (0, True))
```

3.267 $\int x^2 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=225

$$\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^2-\frac{8ic^2\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{105a^3}-\frac{1}{21}a^3c^2x^6\tan^{-1}(ax)-\frac{8ic^2\tan^{-1}(ax)^2}{105a^3}+\frac{c^2\tan^{-1}(ax)}{210a^3}-\frac{16c^2\log\left(\frac{2}{1+iax}\right)}{105a^3}$$

```
[Out] -1/210*c^2*x/a^2+17/630*c^2*x^3+1/105*a^2*c^2*x^5+1/210*c^2*arctan(a*x)/a^3
-8/105*c^2*x^2*arctan(a*x)/a-9/70*a*c^2*x^4*arctan(a*x)-1/21*a^3*c^2*x^6*ar
ctan(a*x)-8/105*I*c^2*arctan(a*x)^2/a^3+1/3*c^2*x^3*arctan(a*x)^2+2/5*a^2*c
^2*x^5*arctan(a*x)^2+1/7*a^4*c^2*x^7*arctan(a*x)^2-16/105*c^2*arctan(a*x)*l
n(2/(1+I*a*x))/a^3-8/105*I*c^2*polylog(2,1-2/(1+I*a*x))/a^3
```

Rubi [A] time = 0.75, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 44, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4948, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 302}

$$-\frac{8ic^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{105a^3}+\frac{1}{105}a^2c^2x^5+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^2-\frac{1}{21}a^3c^2x^6\tan^{-1}(ax)+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)^2-\frac{c^2x}{210a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
```

```
[Out] -(c^2*x)/(210*a^2) + (17*c^2*x^3)/630 + (a^2*c^2*x^5)/105 + (c^2*ArcTan[a*x
])/(210*a^3) - (8*c^2*x^2*ArcTan[a*x])/(105*a) - (9*a*c^2*x^4*ArcTan[a*x])/
70 - (a^3*c^2*x^6*ArcTan[a*x])/21 - (((8*I)/105)*c^2*ArcTan[a*x]^2)/a^3 + (
c^2*x^3*ArcTan[a*x]^2)/3 + (2*a^2*c^2*x^5*ArcTan[a*x]^2)/5 + (a^4*c^2*x^7*A
rcTan[a*x]^2)/7 - (16*c^2*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(105*a^3) - (((8*
I)/105)*c^2*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2\,dx = \int\left(c^2x^2\tan^{-1}(ax)^2+2a^2c^2x^4\tan^{-1}(ax)^2+a^4c^2x^6\tan^{-1}(ax)^2\right)dx$$

$$= c^2\int x^2\tan^{-1}(ax)^2\,dx+\left(2a^2c^2\right)\int x^4\tan^{-1}(ax)^2\,dx+\left(a^4c^2\right)\int x^6\tan^{-1}(a$$

$$= \frac{1}{3}c^2x^3\tan^{-1}(ax)^2+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)^2+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^2-\frac{1}{3}\left(2ac^2\right)\int$$

$$= \frac{1}{3}c^2x^3\tan^{-1}(ax)^2+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)^2+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^2-\frac{\left(2c^2\right)\int x\,t}{3}$$

$$= -\frac{c^2x^2\tan^{-1}(ax)}{3a}-\frac{1}{5}ac^2x^4\tan^{-1}(ax)-\frac{1}{21}a^3c^2x^6\tan^{-1}(ax)-\frac{ic^2\tan^{-1}(ax)^2}{3a^3}$$

$$= \frac{c^2x}{3a^2}+\frac{c^2x^2\tan^{-1}(ax)}{15a}-\frac{9}{70}ac^2x^4\tan^{-1}(ax)-\frac{1}{21}a^3c^2x^6\tan^{-1}(ax)+\frac{ic^2\tan}{15}$$

$$= -\frac{23c^2x}{105a^2}+\frac{16c^2x^3}{315}+\frac{1}{105}a^2c^2x^5-\frac{c^2\tan^{-1}(ax)}{3a^3}-\frac{8c^2x^2\tan^{-1}(ax)}{105a}-\frac{9}{70}ac^2x$$

$$= -\frac{c^2x}{210a^2}+\frac{17c^2x^3}{630}+\frac{1}{105}a^2c^2x^5+\frac{23c^2\tan^{-1}(ax)}{105a^3}-\frac{8c^2x^2\tan^{-1}(ax)}{105a}-\frac{9}{70}a$$

$$= -\frac{c^2x}{210a^2}+\frac{17c^2x^3}{630}+\frac{1}{105}a^2c^2x^5+\frac{c^2\tan^{-1}(ax)}{210a^3}-\frac{8c^2x^2\tan^{-1}(ax)}{105a}-\frac{9}{70}ac^2x$$

$$= -\frac{c^2x}{210a^2}+\frac{17c^2x^3}{630}+\frac{1}{105}a^2c^2x^5+\frac{c^2\tan^{-1}(ax)}{210a^3}-\frac{8c^2x^2\tan^{-1}(ax)}{105a}-\frac{9}{70}ac^2x$$

Mathematica [A] time = 1.30, size = 133, normalized size = 0.59

$$\frac{c^2\left(ax\left(6a^4x^4+17a^2x^2-3\right)+6\left(15a^7x^7+42a^5x^5+35a^3x^3+8i\right)\tan^{-1}(ax)^2-3\tan^{-1}(ax)\left(10a^6x^6+27a^4x^4+\right.}{630a^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
```

```
[Out] (c^2*(a*x*(-3 + 17*a^2*x^2 + 6*a^4*x^4) + 6*(8*I + 35*a^3*x^3 + 42*a^5*x^5
+ 15*a^7*x^7)*ArcTan[a*x]^2 - 3*ArcTan[a*x]*(-1 + 16*a^2*x^2 + 27*a^4*x^4 +
 10*a^6*x^6 + 32*Log[1 + E^((2*I)*ArcTan[a*x])]) + (48*I)*PolyLog[2, -E^((2
*I)*ArcTan[a*x])]))/(630*a^3)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^6+2\,a^2c^2x^4+c^2x^2\right)\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arctan(a*x)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.10, size = 333, normalized size = 1.48

$$\frac{a^4c^2x^7\arctan(ax)^2}{7}+\frac{2a^2c^2x^5\arctan(ax)^2}{5}+\frac{c^2x^3\arctan(ax)^2}{3}-\frac{a^3c^2x^6\arctan(ax)}{21}-\frac{9a\,c^2x^4\arctan(ax)}{70}-\frac{8c^2x^2\,\mathrm{ar}}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^2,x)
```

```
[Out] 1/7*a^4*c^2*x^7*arctan(a*x)^2+2/5*a^2*c^2*x^5*arctan(a*x)^2+1/3*c^2*x^3*arc
tan(a*x)^2-1/21*a^3*c^2*x^6*arctan(a*x)-9/70*a*c^2*x^4*arctan(a*x)-8/105*c^
2*x^2*arctan(a*x)/a+8/105/a^3*c^2*arctan(a*x)*ln(a^2*x^2+1)+1/105*a^2*c^2*x
^5+17/630*c^2*x^3-1/210*c^2*x/a^2+1/210*c^2*arctan(a*x)/a^3+4/105*I/a^3*c^2
*ln(a*x-I)*ln(a^2*x^2+1)+2/105*I/a^3*c^2*ln(I+a*x)^2-4/105*I/a^3*c^2*ln(a*x
-I)*ln(-1/2*I*(I+a*x))-4/105*I/a^3*c^2*dilog(-1/2*I*(I+a*x))+4/105*I/a^3*c^
2*dilog(1/2*I*(a*x-I))+4/105*I/a^3*c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))-4/105*I/
a^3*c^2*ln(I+a*x)*ln(a^2*x^2+1)-2/105*I/a^3*c^2*ln(a*x-I)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{420}\left(15\,a^4c^2x^7+42\,a^2c^2x^5+35\,c^2x^3\right)\arctan(ax)^2-\frac{1}{1680}\left(15\,a^4c^2x^7+42\,a^2c^2x^5+35\,c^2x^3\right)\log\left(a^2x^2+1\right)^2+\int\frac{1}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/420*(15*a^4*c^2*x^7 + 42*a^2*c^2*x^5 + 35*c^2*x^3)*arctan(a*x)^2 - 1/1680
*(15*a^4*c^2*x^7 + 42*a^2*c^2*x^5 + 35*c^2*x^3)*log(a^2*x^2 + 1)^2 + integr
ate(1/1680*(1260*(a^6*c^2*x^8 + 3*a^4*c^2*x^6 + 3*a^2*c^2*x^4 + c^2*x^2)*ar
ctan(a*x)^2 + 105*(a^6*c^2*x^8 + 3*a^4*c^2*x^6 + 3*a^2*c^2*x^4 + c^2*x^2)*l
og(a^2*x^2 + 1)^2 - 8*(15*a^5*c^2*x^7 + 42*a^3*c^2*x^5 + 35*a*c^2*x^3)*arct
an(a*x) + 4*(15*a^6*c^2*x^8 + 42*a^4*c^2*x^6 + 35*a^2*c^2*x^4)*log(a^2*x^2
+ 1))/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x^2\,\mathrm{atan}^2(ax)\,dx+\int 2a^2x^4\,\mathrm{atan}^2(ax)\,dx+\int a^4x^6\,\mathrm{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**2*atan(a*x)**2,x)
```

```
[Out] c**2*(Integral(x**2*atan(a*x)**2, x) + Integral(2*a**2*x**4*atan(a*x)**2, x
) + Integral(a**4*x**6*atan(a*x)**2, x))
```

3.268 $\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=153

$$\frac{c^2\left(a^2x^2+1\right)^2}{60a^2}+\frac{2c^2\left(a^2x^2+1\right)}{45a^2}+\frac{4c^2\log\left(a^2x^2+1\right)}{45a^2}+\frac{c^2\left(a^2x^2+1\right)^3\tan^{-1}(ax)^2}{6a^2}-\frac{c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)}{15a}-\frac{4c^2}{}$$

```
[Out] 2/45*c^2*(a^2*x^2+1)/a^2+1/60*c^2*(a^2*x^2+1)^2/a^2-8/45*c^2*x*arctan(a*x)/
a-4/45*c^2*x*(a^2*x^2+1)*arctan(a*x)/a-1/15*c^2*x*(a^2*x^2+1)^2*arctan(a*x)
/a+1/6*c^2*(a^2*x^2+1)^3*arctan(a*x)^2/a^2+4/45*c^2*ln(a^2*x^2+1)/a^2
```

Rubi [A] time = 0.09, antiderivative size = 153, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4930, 4878, 4846, 260}

$$\frac{c^2\left(a^2x^2+1\right)^2}{60a^2}+\frac{2c^2\left(a^2x^2+1\right)}{45a^2}+\frac{4c^2\log\left(a^2x^2+1\right)}{45a^2}+\frac{c^2\left(a^2x^2+1\right)^3\tan^{-1}(ax)^2}{6a^2}-\frac{c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)}{15a}-\frac{4c^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
```

```
[Out] (2*c^2*(1 + a^2*x^2))/(45*a^2) + (c^2*(1 + a^2*x^2)^2)/(60*a^2) - (8*c^2*x*
ArcTan[a*x])/(45*a) - (4*c^2*x*(1 + a^2*x^2)*ArcTan[a*x])/(45*a) - (c^2*x*(
1 + a^2*x^2)^2*ArcTan[a*x])/(15*a) + (c^2*(1 + a^2*x^2)^3*ArcTan[a*x]^2)/(6
*a^2) + (4*c^2*Log[1 + a^2*x^2])/(45*a^2)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2\,dx=\frac{c^2\left(1+a^2x^2\right)^3\tan^{-1}(ax)^2}{6a^2}-\frac{\int\left(c+a^2cx^2\right)^2\tan^{-1}(ax)\,dx}{3a}$$
$$=\frac{c^2\left(1+a^2x^2\right)^2}{60a^2}-\frac{c^2x\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{15a}+\frac{c^2\left(1+a^2x^2\right)^3\tan^{-1}(ax)^2}{6a^2}-\frac{(4c)\int}{}$$
$$=\frac{2c^2\left(1+a^2x^2\right)}{45a^2}+\frac{c^2\left(1+a^2x^2\right)^2}{60a^2}-\frac{4c^2x\left(1+a^2x^2\right)\tan^{-1}(ax)}{45a}-\frac{c^2x\left(1+a^2x^2\right)^2 t}{15a}$$
$$=\frac{2c^2\left(1+a^2x^2\right)}{45a^2}+\frac{c^2\left(1+a^2x^2\right)^2}{60a^2}-\frac{8c^2x\tan^{-1}(ax)}{45a}-\frac{4c^2x\left(1+a^2x^2\right)\tan^{-1}(ax)}{45a}$$
$$=\frac{2c^2\left(1+a^2x^2\right)}{45a^2}+\frac{c^2\left(1+a^2x^2\right)^2}{60a^2}-\frac{8c^2x\tan^{-1}(ax)}{45a}-\frac{4c^2x\left(1+a^2x^2\right)\tan^{-1}(ax)}{45a}$$

Mathematica [A] time = 0.07, size = 84, normalized size = 0.55

$$\frac{c^2\left(3a^4x^4+14a^2x^2+16\log\left(a^2x^2+1\right)+30\left(a^2x^2+1\right)^3\tan^{-1}(ax)^2-4ax\left(3a^4x^4+10a^2x^2+15\right)\tan^{-1}(ax)\right)}{180a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
[Out] (c^2*(14*a^2*x^2 + 3*a^4*x^4 - 4*a*x*(15 + 10*a^2*x^2 + 3*a^4*x^4)*ArcTan[a
*x] + 30*(1 + a^2*x^2)^3*ArcTan[a*x]^2 + 16*Log[1 + a^2*x^2]))/(180*a^2)
```

fricas [A] time = 0.64, size = 123, normalized size = 0.80

$$\frac{3\,a^4c^2x^4+14\,a^2c^2x^2+30\left(a^6c^2x^6+3\,a^4c^2x^4+3\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2+16\,c^2\log\left(a^2x^2+1\right)-4\left(3\,a^5c^2x^5+\right.}{180\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="fricas")
[Out] 1/180*(3*a^4*c^2*x^4 + 14*a^2*c^2*x^2 + 30*(a^6*c^2*x^6 + 3*a^4*c^2*x^4 + 3
*a^2*c^2*x^2 + c^2)*arctan(a*x)^2 + 16*c^2*log(a^2*x^2 + 1) - 4*(3*a^5*c^2*
x^5 + 10*a^3*c^2*x^3 + 15*a*c^2*x)*arctan(a*x))/a^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.05, size = 142, normalized size = 0.93

$$\frac{a^4c^2\arctan\left(ax\right)^2x^6}{6}+\frac{a^2c^2\arctan\left(ax\right)^2x^4}{2}+\frac{c^2\arctan\left(ax\right)^2x^2}{2}-\frac{a^3c^2\arctan\left(ax\right)x^5}{15}-\frac{2a\,c^2\arctan\left(ax\right)x^3}{9}-\frac{c^2x\,\mathrm{arc}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^2,x)
```

[Out] 1/6*a^4*c^2*arctan(a*x)^2*x^6+1/2*a^2*c^2*arctan(a*x)^2*x^4+1/2*c^2*arctan(a*x)^2*x^2-1/15*a^3*c^2*arctan(a*x)*x^5-2/9*a*c^2*arctan(a*x)*x^3-1/3*c^2*x*arctan(a*x)/a+1/6/a^2*c^2*arctan(a*x)^2+1/60*a^2*c^2*x^4+7/90*c^2*x^2+4/45*c^2*ln(a^2*x^2+1)/a^2

maxima [A] time = 0.31, size = 111, normalized size = 0.73

$$\frac{\left(a^2cx^2+c\right)^3\arctan\left(ax\right)^2}{6\,a^2c}+\frac{\left(3\,a^2c^3x^4+14\,c^3x^2+\frac{16\,c^3\log\left(a^2x^2+1\right)}{a^2}\right)a-4\left(3\,a^4c^3x^5+10\,a^2c^3x^3+15\,c^3x\right)\arctan\left(\right.}{180\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="maxima")

[Out] 1/6*(a^2*c*x^2 + c)^3*arctan(a*x)^2/(a^2*c) + 1/180*((3*a^2*c^3*x^4 + 14*c^3*x^2 + 16*c^3*log(a^2*x^2 + 1)/a^2)*a - 4*(3*a^4*c^3*x^5 + 10*a^2*c^3*x^3 + 15*c^3*x)*arctan(a*x))/(a*c)

mupad [B] time = 0.31, size = 135, normalized size = 0.88

$$\frac{\frac{c^2\left(30\,\mathrm{atan}(a\,x)^2+16\,\ln\left(a^2\,x^2+1\right)\right)}{180}-\frac{a\,c^2\,x\,\mathrm{atan}(a\,x)}{3}}{a^2}+\frac{c^2\,\left(90\,x^2\,\mathrm{atan}\left(a\,x\right)^2+14\,x^2\right)}{180}+\frac{a^2\,c^2\,\left(90\,x^4\,\mathrm{atan}\left(a\,x\right)^2+3\,x^4\right)}{180}-\frac{a^3\,c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*atan(a*x)^2*(c + a^2*c*x^2)^2,x)

[Out] ((c^2*(16*log(a^2*x^2 + 1) + 30*atan(a*x)^2))/180 - (a*c^2*x*atan(a*x))/3)/a^2 + (c^2*(90*x^2*atan(a*x)^2 + 14*x^2))/180 + (a^2*c^2*(90*x^4*atan(a*x)^2 + 3*x^4))/180 - (a^3*c^2*x^5*atan(a*x))/15 + (a^4*c^2*x^6*atan(a*x)^2)/6 - (2*a*c^2*x^3*atan(a*x))/9

sympy [A] time = 2.02, size = 158, normalized size = 1.03

$$\begin{cases}\frac{a^4c^2x^6\,\mathrm{atan}^2\left(ax\right)}{6}-\frac{a^3c^2x^5\,\mathrm{atan}\left(ax\right)}{15}+\frac{a^2c^2x^4\,\mathrm{atan}^2\left(ax\right)}{2}+\frac{a^2c^2x^4}{60}-\frac{2ac^2x^3\,\mathrm{atan}\left(ax\right)}{9}+\frac{c^2x^2\,\mathrm{atan}^2\left(ax\right)}{2}+\frac{7c^2x^2}{90}-\frac{c^2x\,\mathrm{atan}\left(ax\right)}{3a}+\frac{4c^2}{} \\ 0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a**2*c*x**2+c)**2*atan(a*x)**2,x)

[Out] Piecewise((a**4*c**2*x**6*atan(a*x)**2/6 - a**3*c**2*x**5*atan(a*x)/15 + a**2*c**2*x**4*atan(a*x)**2/2 + a**2*c**2*x**4/60 - 2*a*c**2*x**3*atan(a*x)/9 + c**2*x**2*atan(a*x)**2/2 + 7*c**2*x**2/90 - c**2*x*atan(a*x)/(3*a) + 4*c**2*log(x**2 + a**(-2))/(45*a**2) + c**2*atan(a*x)**2/(6*a**2), Ne(a, 0)), (0, True))

3.269 $\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=205

$$\frac{1}{30}a^2c^2x^3+\frac{1}{5}c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2+\frac{4}{15}c^2x\left(a^2x^2+1\right)\tan^{-1}(ax)^2-\frac{c^2\left(a^2x^2+1\right)^2\tan^{-1}(ax)}{10a}-\frac{4c^2\left(a^2x^2+1\right)\text{ta}}{15a}$$

```
[Out] 11/30*c^2*x+1/30*a^2*c^2*x^3-4/15*c^2*(a^2*x^2+1)*arctan(a*x)/a-1/10*c^2*(a
^2*x^2+1)^2*arctan(a*x)/a+8/15*I*c^2*arctan(a*x)^2/a+8/15*c^2*x*arctan(a*x)
^2+4/15*c^2*x*(a^2*x^2+1)*arctan(a*x)^2+1/5*c^2*x*(a^2*x^2+1)^2*arctan(a*x)
^2+16/15*c^2*arctan(a*x)*ln(2/(1+I*a*x))/a+8/15*I*c^2*polylog(2,1-2/(1+I*a*
x))/a
```

Rubi [A] time = 0.14, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.368, Rules used = {4880, 4846, 4920, 4854, 2402, 2315, 8}

$$\frac{8ic^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{15a}+\frac{1}{30}a^2c^2x^3+\frac{1}{5}c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2+\frac{4}{15}c^2x\left(a^2x^2+1\right)\tan^{-1}(ax)^2-\frac{c^2\left(a^2x^2+1\right)^2}{10a}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
```

```
[Out] (11*c^2*x)/30 + (a^2*c^2*x^3)/30 - (4*c^2*(1 + a^2*x^2)*ArcTan[a*x])/(15*a)
 - (c^2*(1 + a^2*x^2)^2*ArcTan[a*x])/(10*a) + (((8*I)/15)*c^2*ArcTan[a*x]^2
)/a + (8*c^2*x*ArcTan[a*x]^2)/15 + (4*c^2*x*(1 + a^2*x^2)*ArcTan[a*x]^2)/15
 + (c^2*x*(1 + a^2*x^2)^2*ArcTan[a*x]^2)/5 + (16*c^2*ArcTan[a*x]*Log[2/(1 +
 I*a*x)])/(15*a) + (((8*I)/15)*c^2*PolyLog[2, 1 - 2/(1 + I*a*x)])/a
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2\,dx = -\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{10a}+\frac{1}{5}c^2x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2+\frac{1}{10}c\int\left(c+a^2cx^2\right)$$

$$=\frac{c^2x}{10}+\frac{1}{30}a^2c^2x^3-\frac{4c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{10a}+\frac{4}{15}c^2$$

$$=\frac{11c^2x}{30}+\frac{1}{30}a^2c^2x^3-\frac{4c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{10a}+\frac{8}{15}$$

$$=\frac{11c^2x}{30}+\frac{1}{30}a^2c^2x^3-\frac{4c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{10a}+\frac{8i}{}$$

$$=\frac{11c^2x}{30}+\frac{1}{30}a^2c^2x^3-\frac{4c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{10a}+\frac{8i}{}$$

$$=\frac{11c^2x}{30}+\frac{1}{30}a^2c^2x^3-\frac{4c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{10a}+\frac{8i}{}$$

$$=\frac{11c^2x}{30}+\frac{1}{30}a^2c^2x^3-\frac{4c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a}-\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{10a}+\frac{8i}{}$$

Mathematica [A] time = 0.69, size = 112, normalized size = 0.55

$$\frac{c^2\left(ax\left(a^2x^2+11\right)+2\left(3a^5x^5+10a^3x^3+15ax-8i\right)\tan^{-1}(ax)^2-\tan^{-1}(ax)\left(3a^4x^4+14a^2x^2-32\log\left(1+e^{2i\tan}\right.\right.\right.}{30a}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
```

```
[Out] (c^2*(a*x*(11 + a^2*x^2) + 2*(-8*I + 15*a*x + 10*a^3*x^3 + 3*a^5*x^5)*ArcTa
n[a*x]^2 - ArcTan[a*x]*(11 + 14*a^2*x^2 + 3*a^4*x^4 - 32*Log[1 + E^((2*I)*A
rcTan[a*x])]) - (16*I)*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))/(30*a)
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.10, size = 304, normalized size = 1.48

$$\frac{a^4c^2\arctan(ax)^2x^5}{5}+\frac{2a^2c^2\arctan(ax)^2x^3}{3}+c^2x\arctan(ax)^2-\frac{a^3c^2\arctan(ax)x^4}{10}-\frac{7a\,c^2\arctan(ax)x^2}{15}-\frac{8c^2\,\mathrm{arct}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^2,x)
```

```
[Out] 1/5*a^4*c^2*arctan(a*x)^2*x^5+2/3*a^2*c^2*arctan(a*x)^2*x^3+c^2*x*arctan(a*
x)^2-1/10*a^3*c^2*arctan(a*x)*x^4-7/15*a*c^2*arctan(a*x)*x^2-8/15/a*c^2*arc
tan(a*x)*ln(a^2*x^2+1)+1/30*a^2*c^2*x^3+11/30*c^2*x-11/30/a*c^2*arctan(a*x)
+4/15*I/a*c^2*dilog(-1/2*I*(I+a*x))-2/15*I/a*c^2*ln(I+a*x)^2+2/15*I/a*c^2*l
n(a*x-I)^2-4/15*I/a*c^2*dilog(1/2*I*(a*x-I))+4/15*I/a*c^2*ln(a*x-I)*ln(-1/2
*I*(I+a*x))-4/15*I/a*c^2*ln(a*x-I)*ln(a^2*x^2+1)-4/15*I/a*c^2*ln(I+a*x)*ln(
1/2*I*(a*x-I))+4/15*I/a*c^2*ln(I+a*x)*ln(a^2*x^2+1)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$180\,a^6c^2\int\frac{x^6\arctan(ax)^2}{240\left(a^2x^2+1\right)}\,dx+15\,a^6c^2\int\frac{x^6\log\left(a^2x^2+1\right)^2}{240\left(a^2x^2+1\right)}\,dx+12\,a^6c^2\int\frac{x^6\log\left(a^2x^2+1\right)}{240\left(a^2x^2+1\right)}\,dx-24\,a^5c^2\int\frac{x^5\,\mathrm{ar}}{240\,(}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 180*a^6*c^2*integrate(1/240*x^6*arctan(a*x)^2/(a^2*x^2 + 1), x) + 15*a^6*c^
2*integrate(1/240*x^6*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 12*a^6*c^2*int
egrate(1/240*x^6*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) - 24*a^5*c^2*integrate(
1/240*x^5*arctan(a*x)/(a^2*x^2 + 1), x) + 540*a^4*c^2*integrate(1/240*x^4*a
rctan(a*x)^2/(a^2*x^2 + 1), x) + 45*a^4*c^2*integrate(1/240*x^4*log(a^2*x^2
 + 1)^2/(a^2*x^2 + 1), x) + 40*a^4*c^2*integrate(1/240*x^4*log(a^2*x^2 + 1)
/(a^2*x^2 + 1), x) - 80*a^3*c^2*integrate(1/240*x^3*arctan(a*x)/(a^2*x^2 +
1), x) + 540*a^2*c^2*integrate(1/240*x^2*arctan(a*x)^2/(a^2*x^2 + 1), x) +
45*a^2*c^2*integrate(1/240*x^2*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 60*a^
2*c^2*integrate(1/240*x^2*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) + 1/4*c^2*arct
an(a*x)^3/a - 120*a*c^2*integrate(1/240*x*arctan(a*x)/(a^2*x^2 + 1), x) + 1
/60*(3*a^4*c^2*x^5 + 10*a^2*c^2*x^3 + 15*c^2*x)*arctan(a*x)^2 + 15*c^2*inte
grate(1/240*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) - 1/240*(3*a^4*c^2*x^5 + 1
0*a^2*c^2*x^3 + 15*c^2*x)*log(a^2*x^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(atan(a*x)^2*(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int 2a^2x^2\operatorname{atan}^2(ax)\,dx+\int a^4x^4\operatorname{atan}^2(ax)\,dx+\int \operatorname{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**2,x)
```

```
[Out] c**2*(Integral(2*a**2*x**2*atan(a*x)**2, x) + Integral(a**4*x**4*atan(a*x)*
*2, x) + Integral(atan(a*x)**2, x))
```

3.270 $\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}{x} \, dx$

Optimal. Leaf size=235

$$\frac{1}{4}a^4c^2x^4 \tan^{-1}(ax)^2-\frac{1}{6}a^3c^2x^3 \tan^{-1}(ax)+\frac{1}{12}a^2c^2x^2+\frac{2}{3}c^2 \log\left(a^2x^2+1\right)+a^2c^2x^2 \tan^{-1}(ax)^2-\frac{1}{2}c^2\text{Li}_3\left(1-\frac{2}{iax+1}\right)$$

```
[Out] 1/12*a^2*c^2*x^2-3/2*a*c^2*x*arctan(a*x)-1/6*a^3*c^2*x^3*arctan(a*x)+3/4*c^
2*arctan(a*x)^2+a^2*c^2*x^2*arctan(a*x)^2+1/4*a^4*c^2*x^4*arctan(a*x)^2-2*c
^2*arctan(a*x)^2*arctanh(-1+2/(1+I*a*x))+2/3*c^2*ln(a^2*x^2+1)-I*c^2*arctan
(a*x)*polylog(2,1-2/(1+I*a*x))+I*c^2*arctan(a*x)*polylog(2,-1+2/(1+I*a*x))-
1/2*c^2*polylog(3,1-2/(1+I*a*x))+1/2*c^2*polylog(3,-1+2/(1+I*a*x))
```

Rubi [A] time = 0.51, antiderivative size = 235, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4948, 4850, 4988, 4884, 4994, 6610, 4852, 4916, 4846, 260, 266, 43}

$$-\frac{1}{2}c^2\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)+\frac{1}{2}c^2\text{PolyLog}\left(3,-1+\frac{2}{1+iax}\right)-ic^2 \tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+ic^2 \tan^{-1}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x,x]
```

```
[Out] (a^2*c^2*x^2)/12 - (3*a*c^2*x*ArcTan[a*x])/2 - (a^3*c^2*x^3*ArcTan[a*x])/6
+ (3*c^2*ArcTan[a*x]^2)/4 + a^2*c^2*x^2*ArcTan[a*x]^2 + (a^4*c^2*x^4*ArcTan
[a*x]^2)/4 + 2*c^2*ArcTan[a*x]^2*ArcTanh[1 - 2/(1 + I*a*x)] + (2*c^2*Log[1
+ a^2*x^2])/3 - I*c^2*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)] + I*c^2*Arc
Tan[a*x]*PolyLog[2, -1 + 2/(1 + I*a*x)] - (c^2*PolyLog[3, 1 - 2/(1 + I*a*x)
])/2 + (c^2*PolyLog[3, -1 + 2/(1 + I*a*x)])/2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
```

```
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^2}{x} dx = \int \left(\frac{c^2 \tan^{-1}(ax)^2}{x} + 2a^2c^2x \tan^{-1}(ax)^2 + a^4c^2x^3 \tan^{-1}(ax)^2\right) dx$$
$$= c^2 \int \frac{\tan^{-1}(ax)^2}{x} dx + (2a^2c^2) \int x \tan^{-1}(ax)^2 dx + (a^4c^2) \int x^3 \tan^{-1}(ax)^2 dx$$
$$= a^2c^2x^2 \tan^{-1}(ax)^2 + \frac{1}{4}a^4c^2x^4 \tan^{-1}(ax)^2 + 2c^2 \tan^{-1}(ax)^2 \tanh^{-1}\left(1 - \frac{2}{1+iax}\right) -$$
$$= a^2c^2x^2 \tan^{-1}(ax)^2 + \frac{1}{4}a^4c^2x^4 \tan^{-1}(ax)^2 + 2c^2 \tan^{-1}(ax)^2 \tanh^{-1}\left(1 - \frac{2}{1+iax}\right) -$$
$$= -2ac^2x \tan^{-1}(ax) - \frac{1}{6}a^3c^2x^3 \tan^{-1}(ax) + c^2 \tan^{-1}(ax)^2 + a^2c^2x^2 \tan^{-1}(ax)^2 + \frac{1}{4}a$$
$$= -\frac{3}{2}ac^2x \tan^{-1}(ax) - \frac{1}{6}a^3c^2x^3 \tan^{-1}(ax) + \frac{3}{4}c^2 \tan^{-1}(ax)^2 + a^2c^2x^2 \tan^{-1}(ax)^2 +$$
$$= -\frac{3}{2}ac^2x \tan^{-1}(ax) - \frac{1}{6}a^3c^2x^3 \tan^{-1}(ax) + \frac{3}{4}c^2 \tan^{-1}(ax)^2 + a^2c^2x^2 \tan^{-1}(ax)^2 +$$
$$= \frac{1}{12}a^2c^2x^2 - \frac{3}{2}ac^2x \tan^{-1}(ax) - \frac{1}{6}a^3c^2x^3 \tan^{-1}(ax) + \frac{3}{4}c^2 \tan^{-1}(ax)^2 + a^2c^2x^2 \tan$$

Mathematica [A] time = 0.34, size = 218, normalized size = 0.93

$$\frac{1}{24}c^2 \left(6a^4x^4 \tan^{-1}(ax)^2 - 4a^3x^3 \tan^{-1}(ax) + 2a^2x^2 + 16 \log(a^2x^2+1) + 24a^2x^2 \tan^{-1}(ax)^2 + 24i \tan^{-1}(ax) \mathrm{Li}_2 (e$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x,x]
```

```
[Out] (c^2*(2 - I*Pi^3 + 2*a^2*x^2 - 36*a*x*ArcTan[a*x] - 4*a^3*x^3*ArcTan[a*x] +
 18*ArcTan[a*x]^2 + 24*a^2*x^2*ArcTan[a*x]^2 + 6*a^4*x^4*ArcTan[a*x]^2 + (1
6*I)*ArcTan[a*x]^3 + 24*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] - 24*
ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] + 16*Log[1 + a^2*x^2] + (24*I)
*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + (24*I)*ArcTan[a*x]*PolyLo
g[2, -E^((2*I)*ArcTan[a*x])] + 12*PolyLog[3, E^((-2*I)*ArcTan[a*x])] - 12*P
olyLog[3, -E^((2*I)*ArcTan[a*x])]))/24
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{(a^4c^2x^4 + 2a^2c^2x^2 + c^2)\arctan(ax)^2}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^2/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C]   time = 6.29, size = 1173, normalized size = 4.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^2/x,x)
```

```
[Out] -1/2*I*c^2*arctan(a*x)^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(
a^2*x^2+1)+1))^2+1/12*a^2*c^2*x^2+a^2*c^2*x^2*arctan(a*x)^2+I*c^2*arctan(a*
x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+1/2*I*c^2*arctan(a*x)^2*Pi-2*I*c^2*a
rctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*c^2*arctan(a*x)*poly
log(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/2*I*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*
a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x
^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-1/2*I*c^2*arctan(a*x)^2*Pi*csgn(I/(
(1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2
/(a^2*x^2+1)+1))^2-1/2*I*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+
1)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/
2*I*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a
^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))
+3/4*c^2*arctan(a*x)^2+2*c^2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*c^2*
polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/2*c^2*polylog(3,-(1+I*a*x)^2/(a^2*
x^2+1))-4/3*c^2*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+1/2*I*c^2*arctan(a*x)^2*Pi*cs
gn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(
I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+1/12*c^2-3/2*a*c
^2*x*arctan(a*x)-1/6*a^3*c^2*x^3*arctan(a*x)+1/4*a^4*c^2*x^4*arctan(a*x)^2+
c^2*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+c^2*arctan(a*x)^2*ln(1-
(1+I*a*x)/(a^2*x^2+1)^(1/2))+4/3*I*c^2*arctan(a*x)+c^2*arctan(a*x)^2*ln(a*x
)-c^2*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+1/2*I*c^2*arctan(a*x)^2*P
i*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3+1/2*I*c
^2*arctan(a*x)^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+
1)+1))^3
```

maxima [F]   time = 0.00, size = 0, normalized size = 0.00

$$12\,a^6c^2\int\frac{x^6\arctan(ax)^2}{16\left(a^2x^3+x\right)}\,dx+a^6c^2\int\frac{x^6\log\left(a^2x^2+1\right)^2}{16\left(a^2x^3+x\right)}\,dx+a^6c^2\int\frac{x^6\log\left(a^2x^2+1\right)}{16\left(a^2x^3+x\right)}\,dx-2\,a^5c^2\int\frac{x^5\arctan}{16\left(a^2x^3\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x,x, algorithm="maxima")
```

```
[Out] 12*a^6*c^2*integrate(1/16*x^6*arctan(a*x)^2/(a^2*x^3 + x), x) + a^6*c^2*int
egrate(1/16*x^6*log(a^2*x^2 + 1)^2/(a^2*x^3 + x), x) + a^6*c^2*integrate(1/
16*x^6*log(a^2*x^2 + 1)/(a^2*x^3 + x), x) - 2*a^5*c^2*integrate(1/16*x^5*ar
ctan(a*x)/(a^2*x^3 + x), x) + 36*a^4*c^2*integrate(1/16*x^4*arctan(a*x)^2/(
a^2*x^3 + x), x) + 3*a^4*c^2*integrate(1/16*x^4*log(a^2*x^2 + 1)^2/(a^2*x^3
 + x), x) + 4*a^4*c^2*integrate(1/16*x^4*log(a^2*x^2 + 1)/(a^2*x^3 + x), x)
 - 8*a^3*c^2*integrate(1/16*x^3*arctan(a*x)/(a^2*x^3 + x), x) + 36*a^2*c^2*
integrate(1/16*x^2*arctan(a*x)^2/(a^2*x^3 + x), x) + 1/32*c^2*log(a^2*x^2 +
 1)^3 + 1/16*(a^4*c^2*x^4 + 4*a^2*c^2*x^2)*arctan(a*x)^2 + 12*c^2*integrate
(1/16*arctan(a*x)^2/(a^2*x^3 + x), x) + c^2*integrate(1/16*log(a^2*x^2 + 1)
^2/(a^2*x^3 + x), x) - 1/64*(a^4*c^2*x^4 + 4*a^2*c^2*x^2)*log(a^2*x^2 + 1)^
2
```

mupad [F]   time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int \frac{\operatorname{atan}^2(ax)}{x}\,dx + \int 2a^2x\operatorname{atan}^2(ax)\,dx + \int a^4x^3\operatorname{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**2/x,x)
```

```
[Out] c**2*(Integral(atan(a*x)**2/x, x) + Integral(2*a**2*x*atan(a*x)**2, x) + In
tegral(a**4*x**3*atan(a*x)**2, x))
```

3.271 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^2}{x^2} dx$

Optimal. Leaf size=205

$$\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)^2-\frac{1}{3}a^3c^2x^2\tan^{-1}(ax)+\frac{1}{3}a^2c^2x+2a^2c^2x\tan^{-1}(ax)^2-iac^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)+\frac{5}{3}iac^2\text{Li}_2\left(1-\frac{2}{iax}\right.$$

```
[Out] 1/3*a^2*c^2*x-1/3*a*c^2*arctan(a*x)-1/3*a^3*c^2*x^2*arctan(a*x)+2/3*I*a*c^2
*arctan(a*x)^2-c^2*arctan(a*x)^2/x+2*a^2*c^2*x*arctan(a*x)^2+1/3*a^4*c^2*x^
3*arctan(a*x)^2+10/3*a*c^2*arctan(a*x)*ln(2/(1+I*a*x))+2*a*c^2*arctan(a*x)*
ln(2-2/(1-I*a*x))-I*a*c^2*polylog(2,-1+2/(1-I*a*x))+5/3*I*a*c^2*polylog(2,1
-2/(1+I*a*x))
```

Rubi [A] time = 0.42, antiderivative size = 205, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 13, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.591, Rules used = {4948, 4846, 4920, 4854, 2402, 2315, 4852, 4924, 4868, 2447, 4916, 321, 203}

$$-iac^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+\frac{5}{3}iac^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)^2-\frac{1}{3}a^3c^2x^2\tan^{-1}(ax)+\frac{1}{3}a$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] (a^2*c^2*x)/3 - (a*c^2*ArcTan[a*x])/3 - (a^3*c^2*x^2*ArcTan[a*x])/3 + ((2*I
)/3)*a*c^2*ArcTan[a*x]^2 - (c^2*ArcTan[a*x]^2)/x + 2*a^2*c^2*x*ArcTan[a*x]^
2 + (a^4*c^2*x^3*ArcTan[a*x]^2)/3 + (10*a*c^2*ArcTan[a*x]*Log[2/(1 + I*a*x)
])/3 + 2*a*c^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)] - I*a*c^2*PolyLog[2, -1 +
 2/(1 - I*a*x)] + ((5*I)/3)*a*c^2*PolyLog[2, 1 - 2/(1 + I*a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
```

```
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
```

```
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}{x^2}\,dx = \int \left(2a^2c^2\tan^{-1}(ax)^2 + \frac{c^2\tan^{-1}(ax)^2}{x^2} + a^4c^2x^2\tan^{-1}(ax)^2\right)dx$$
$$= c^2\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx + \left(2a^2c^2\right)\int \tan^{-1}(ax)^2\,dx + \left(a^4c^2\right)\int x^2\tan^{-1}(ax)^2\,dx$$
$$= -\frac{c^2\tan^{-1}(ax)^2}{x} + 2a^2c^2x\tan^{-1}(ax)^2 + \frac{1}{3}a^4c^2x^3\tan^{-1}(ax)^2 + \left(2ac^2\right)\int \frac{\tan^{-1}}{x(1+}$$
$$= iac^2\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^2}{x} + 2a^2c^2x\tan^{-1}(ax)^2 + \frac{1}{3}a^4c^2x^3\tan^{-1}(ax)^2 +$$
$$= -\frac{1}{3}a^3c^2x^2\tan^{-1}(ax) + \frac{2}{3}iac^2\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^2}{x} + 2a^2c^2x\tan^{-1}(ax)^2$$
$$= \frac{1}{3}a^2c^2x - \frac{1}{3}a^3c^2x^2\tan^{-1}(ax) + \frac{2}{3}iac^2\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^2}{x} + 2a^2c^2x\tan$$
$$= \frac{1}{3}a^2c^2x - \frac{1}{3}ac^2\tan^{-1}(ax) - \frac{1}{3}a^3c^2x^2\tan^{-1}(ax) + \frac{2}{3}iac^2\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(}{x}$$
$$= \frac{1}{3}a^2c^2x - \frac{1}{3}ac^2\tan^{-1}(ax) - \frac{1}{3}a^3c^2x^2\tan^{-1}(ax) + \frac{2}{3}iac^2\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(}{x}$$

Mathematica [A] time = 0.38, size = 167, normalized size = 0.81

$$c^2\left(a^4x^4\tan^{-1}(ax)^2 - a^3x^3\tan^{-1}(ax) + a^2x^2 + 6a^2x^2\tan^{-1}(ax)^2 - 5iax\mathrm{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) - 3iax\mathrm{Li}_2\left(e^{2i\tan^{-1}(ax)}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] (c^2*(a^2*x^2 - a*x*ArcTan[a*x] - a^3*x^3*ArcTan[a*x] - 3*ArcTan[a*x]^2 - (
8*I)*a*x*ArcTan[a*x]^2 + 6*a^2*x^2*ArcTan[a*x]^2 + a^4*x^4*ArcTan[a*x]^2 +
6*a*x*ArcTan[a*x]*Log[1 - E^((2*I)*ArcTan[a*x])] + 10*a*x*ArcTan[a*x]*Log[1
 + E^((2*I)*ArcTan[a*x])] - (5*I)*a*x*PolyLog[2, -E^((2*I)*ArcTan[a*x])] -
(3*I)*a*x*PolyLog[2, E^((2*I)*ArcTan[a*x])]))/(3*x)
```

fricas [F] time = 0.80, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\arctan(ax)^2}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^2/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.12, size = 346, normalized size = 1.69

$$\frac{a^4c^2x^3\arctan(ax)^2}{3}+2a^2c^2x\arctan(ax)^2-\frac{c^2\arctan(ax)^2}{x}-\frac{a^3c^2x^2\arctan(ax)}{3}+2a\,c^2\arctan(ax)\ln(ax)-\frac{8a\,c^2\,\text{ar}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^2/x^2,x)
```

```
[Out] 1/3*a^4*c^2*x^3*arctan(a*x)^2+2*a^2*c^2*x*arctan(a*x)^2-c^2*arctan(a*x)^2/x
-1/3*a^3*c^2*x^2*arctan(a*x)+2*a*c^2*arctan(a*x)*ln(a*x)-8/3*a*c^2*arctan(a
*x)*ln(a^2*x^2+1)+1/3*a^2*c^2*x-1/3*a*c^2*arctan(a*x)+4/3*I*a*c^2*ln(I+a*x)
*ln(a^2*x^2+1)-2/3*I*a*c^2*ln(I+a*x)^2+4/3*I*a*c^2*dilog(-1/2*I*(I+a*x))+2/
3*I*a*c^2*ln(a*x-I)^2-4/3*I*a*c^2*dilog(1/2*I*(a*x-I))-I*a*c^2*dilog(1-I*a*
x)+4/3*I*a*c^2*ln(a*x-I)*ln(-1/2*I*(I+a*x))+I*a*c^2*dilog(1+I*a*x)-4/3*I*a*
c^2*ln(a*x-I)*ln(a^2*x^2+1)+I*a*c^2*ln(a*x)*ln(1+I*a*x)-4/3*I*a*c^2*ln(I+a*
x)*ln(1/2*I*(a*x-I))-I*a*c^2*ln(a*x)*ln(1-I*a*x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)^2\,\left(c\,a^2\,x^2+c\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x^2,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int 2a^2\,\mathrm{atan}^2(ax)\,dx+\int \frac{\mathrm{atan}^2(ax)}{x^2}\,dx+\int a^4x^2\,\mathrm{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**2/x**2,x)
```

```
[Out] c**2*(Integral(2*a**2*atan(a*x)**2, x) + Integral(atan(a*x)**2/x**2, x) + I
ntegral(a**4*x**2*atan(a*x)**2, x))
```

3.272 $\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}{x^3}\,dx$

Optimal. Leaf size=207

$$\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^2-a^3c^2x\tan^{-1}(ax)-a^2c^2\text{Li}_3\left(1-\frac{2}{iax+1}\right)+a^2c^2\text{Li}_3\left(\frac{2}{iax+1}-1\right)-2ia^2c^2\text{Li}_2\left(1-\frac{2}{iax+1}\right)\text{ta}$$

```
[Out] -a*c^2*arctan(a*x)/x-a^3*c^2*x*arctan(a*x)-1/2*c^2*arctan(a*x)^2/x^2+1/2*a^
4*c^2*x^2*arctan(a*x)^2-4*a^2*c^2*arctan(a*x)^2*arctanh(-1+2/(1+I*a*x))+a^2
*c^2*ln(x)-2*I*a^2*c^2*arctan(a*x)*polylog(2,1-2/(1+I*a*x))+2*I*a^2*c^2*arc
tan(a*x)*polylog(2,-1+2/(1+I*a*x))-a^2*c^2*polylog(3,1-2/(1+I*a*x))+a^2*c^2
*polylog(3,-1+2/(1+I*a*x))
```

Rubi [A] time = 0.45, antiderivative size = 207, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 15, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.682, Rules used = {4948, 4852, 4918, 266, 36, 29, 31, 4884, 4850, 4988, 4994, 6610, 4916, 4846, 260}

$$-a^2c^2\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)+a^2c^2\text{PolyLog}\left(3,-1+\frac{2}{1+iax}\right)-2ia^2c^2\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+2$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] -((a*c^2*ArcTan[a*x])/x) - a^3*c^2*x*ArcTan[a*x] - (c^2*ArcTan[a*x]^2)/(2*x
^2) + (a^4*c^2*x^2*ArcTan[a*x]^2)/2 + 4*a^2*c^2*ArcTan[a*x]^2*ArcTanh[1 - 2
/(1 + I*a*x)] + a^2*c^2*Log[x] - (2*I)*a^2*c^2*ArcTan[a*x]*PolyLog[2, 1 - 2
/(1 + I*a*x)] + (2*I)*a^2*c^2*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 + I*a*x)] -
a^2*c^2*PolyLog[3, 1 - 2/(1 + I*a*x)] + a^2*c^2*PolyLog[3, -1 + 2/(1 + I*a*
x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
```

```
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}{x^3}\,dx = \int\left(\frac{c^2\tan^{-1}(ax)^2}{x^3}+\frac{2a^2c^2\tan^{-1}(ax)^2}{x}+a^4c^2x\tan^{-1}(ax)^2\right)dx$$

$$= c^2\int\frac{\tan^{-1}(ax)^2}{x^3}\,dx+\left(2a^2c^2\right)\int\frac{\tan^{-1}(ax)^2}{x}\,dx+\left(a^4c^2\right)\int x\tan^{-1}(ax)^2\,dx$$

$$= -\frac{c^2\tan^{-1}(ax)^2}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^2+4a^2c^2\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{2}{1+iax}\right.$$

$$= -\frac{c^2\tan^{-1}(ax)^2}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^2+4a^2c^2\tan^{-1}(ax)^2\tanh^{-1}\left(1-\frac{2}{1+iax}\right.$$

$$= -\frac{ac^2\tan^{-1}(ax)}{x}-a^3c^2x\tan^{-1}(ax)-\frac{c^2\tan^{-1}(ax)^2}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^2+4a$$

$$= -\frac{ac^2\tan^{-1}(ax)}{x}-a^3c^2x\tan^{-1}(ax)-\frac{c^2\tan^{-1}(ax)^2}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^2+4a$$

$$= -\frac{ac^2\tan^{-1}(ax)}{x}-a^3c^2x\tan^{-1}(ax)-\frac{c^2\tan^{-1}(ax)^2}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^2+4a$$

$$= -\frac{ac^2\tan^{-1}(ax)}{x}-a^3c^2x\tan^{-1}(ax)-\frac{c^2\tan^{-1}(ax)^2}{2x^2}+\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^2+4a$$

Mathematica [A] time = 0.33, size = 226, normalized size = 1.09

$$a^2c^2\left(\log\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)+\frac{1}{2}\log\left(a^2x^2+1\right)+\frac{1}{2}a^2x^2\tan^{-1}(ax)^2-\frac{\tan^{-1}(ax)^2}{2a^2x^2}+2i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)+\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] a^2*c^2*((-1/12*I)*Pi^3 - ArcTan[a*x]/(a*x) - a*x*ArcTan[a*x] - ArcTan[a*x]
^2/(2*a^2*x^2) + (a^2*x^2*ArcTan[a*x]^2)/2 + ((4*I)/3)*ArcTan[a*x]^3 + 2*Ar
cTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] - 2*ArcTan[a*x]^2*Log[1 + E^((2
*I)*ArcTan[a*x])] + Log[(a*x)/Sqrt[1 + a^2*x^2]] + Log[1 + a^2*x^2]/2 + (2*
I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + (2*I)*ArcTan[a*x]*PolyL
og[2, -E^((2*I)*ArcTan[a*x])] + PolyLog[3, E^((-2*I)*ArcTan[a*x])] - PolyLo
g[3, -E^((2*I)*ArcTan[a*x])])
```

fricas [F] time = 1.03, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^2/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 5.53, size = 1255, normalized size = 6.06

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^2/x^3,x)
```

```
[Out] 1/2*a^4*c^2*x^2*arctan(a*x)^2-a*c^2*arctan(a*x)/x-a^3*c^2*x*arctan(a*x)-1/2
*c^2*arctan(a*x)^2/x^2+I*a^2*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*
x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2
+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+I*a^2*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I
*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3+I*a^2*c^2*arctan(a*x)
^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3-I*a^2
*c^2*arctan(a*x)^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^
2+1)+1))^2+a^2*c^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-a^2*c^2*polylog(3,-(1+
I*a*x)^2/(a^2*x^2+1))-a^2*c^2*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+a^2*c^2*ln((1+I
*a*x)/(a^2*x^2+1)^(1/2)-1)+4*a^2*c^2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)+4*a^2*c^2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+I*a^2*c^2*arctan(a*x)^2*
Pi+2*I*a^2*c^2*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))-4*I*a^2*c^2*
arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-4*I*a^2*c^2*arctan(a*x)*
polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*a^2*c^2*arctan(a*x)^2*ln((1+I*a*x
)^2/(a^2*x^2+1)-1)+2*a^2*c^2*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2)
)+2*a^2*c^2*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*a^2*c^2*arcta
n(a*x)^2*ln(a*x)+I*a^2*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)
-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x
)^2/(a^2*x^2+1)+1))-I*a^2*c^2*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2
+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-I
*a^2*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(
a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
)^2-I*a^2*c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*(
(1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x^3,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int \frac{\operatorname{atan}^2(ax)}{x^3}\,dx + \int \frac{2a^2\operatorname{atan}^2(ax)}{x}\,dx + \int a^4x\operatorname{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**2/x**3,x)
```

```
[Out] c**2*(Integral(atan(a*x)**2/x**3, x) + Integral(2*a**2*atan(a*x)**2/x, x) +
 Integral(a**4*x*atan(a*x)**2, x))
```

3.273 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^2}{x^4} dx$

Optimal. Leaf size=216

$$a^4c^2x\tan^{-1}(ax)^2-\frac{5}{3}ia^3c^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)+ia^3c^2\text{Li}_2\left(1-\frac{2}{iax+1}\right)-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^2-\frac{1}{3}a^3c^2\tan^{-1}(ax)+2a^3c^2\log$$

```
[Out] -1/3*a^2*c^2/x-1/3*a^3*c^2*arctan(a*x)-1/3*a*c^2*arctan(a*x)/x^2-2/3*I*a^3*
c^2*arctan(a*x)^2-1/3*c^2*arctan(a*x)^2/x^3-2*a^2*c^2*arctan(a*x)^2/x+a^4*c
^2*x*arctan(a*x)^2+2*a^3*c^2*arctan(a*x)*ln(2/(1+I*a*x))+10/3*a^3*c^2*arcta
n(a*x)*ln(2-2/(1-I*a*x))-5/3*I*a^3*c^2*polylog(2,-1+2/(1-I*a*x))+I*a^3*c^2*
polylog(2,1-2/(1+I*a*x))
```

Rubi [A] time = 0.44, antiderivative size = 216, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 13, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.591, Rules used = {4948, 4846, 4920, 4854, 2402, 2315, 4852, 4918, 325, 203, 4924, 4868, 2447}

$$-\frac{5}{3}ia^3c^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+ia^3c^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)-\frac{a^2c^2}{3x}+a^4c^2x\tan^{-1}(ax)^2-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^2-$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -(a^2*c^2)/(3*x) - (a^3*c^2*ArcTan[a*x])/3 - (a*c^2*ArcTan[a*x])/(3*x^2) -
((2*I)/3)*a^3*c^2*ArcTan[a*x]^2 - (c^2*ArcTan[a*x]^2)/(3*x^3) - (2*a^2*c^2*
ArcTan[a*x]^2)/x + a^4*c^2*x*ArcTan[a*x]^2 + 2*a^3*c^2*ArcTan[a*x]*Log[2/(1
 + I*a*x)] + (10*a^3*c^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/3 - ((5*I)/3)*
a^3*c^2*PolyLog[2, -1 + 2/(1 - I*a*x)] + I*a^3*c^2*PolyLog[2, 1 - 2/(1 + I*
a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
```

```
b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}{x^4}\,dx = \int \left(a^4c^2\tan^{-1}(ax)^2+\frac{c^2\tan^{-1}(ax)^2}{x^4}+\frac{2a^2c^2\tan^{-1}(ax)^2}{x^2}\right)dx$$
$$= c^2\int \frac{\tan^{-1}(ax)^2}{x^4}\,dx+\left(2a^2c^2\right)\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx+\left(a^4c^2\right)\int \tan^{-1}(ax)^2\,dx$$
$$= -\frac{c^2\tan^{-1}(ax)^2}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^2}{x}+a^4c^2x\tan^{-1}(ax)^2+\frac{1}{3}\left(2ac^2\right)\int \frac{\tan^{-1}(ax}{x^3\left(1+a^2x\right.}$$
$$= -ia^3c^2\tan^{-1}(ax)^2-\frac{c^2\tan^{-1}(ax)^2}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^2}{x}+a^4c^2x\tan^{-1}(ax)^2+\frac{1}{3}\left(2\right.$$
$$= -\frac{ac^2\tan^{-1}(ax)}{3x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^2-\frac{c^2\tan^{-1}(ax)^2}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^2}{x}+a^4c^2x$$
$$= -\frac{a^2c^2}{3x}-\frac{ac^2\tan^{-1}(ax)}{3x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^2-\frac{c^2\tan^{-1}(ax)^2}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^2}{x}$$
$$= -\frac{a^2c^2}{3x}-\frac{1}{3}a^3c^2\tan^{-1}(ax)-\frac{ac^2\tan^{-1}(ax)}{3x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^2-\frac{c^2\tan^{-1}(ax)^2}{3x^3}-$$

Mathematica [A] time = 0.41, size = 189, normalized size = 0.88

$$\frac{c^2\left(3a^4x^4\tan^{-1}(ax)^2-3ia^3x^3\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)-5ia^3x^3\text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)-8ia^3x^3\tan^{-1}(ax)^2-a^3x^3\tan^{-1}(ax)+1\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] (c^2*(-(a^2*x^2) - a*x*ArcTan[a*x] - a^3*x^3*ArcTan[a*x] - ArcTan[a*x]^2 -
6*a^2*x^2*ArcTan[a*x]^2 - (8*I)*a^3*x^3*ArcTan[a*x]^2 + 3*a^4*x^4*ArcTan[a*
x]^2 + 10*a^3*x^3*ArcTan[a*x]*Log[1 - E^((2*I)*ArcTan[a*x])] + 6*a^3*x^3*Ar
cTan[a*x]*Log[1 + E^((2*I)*ArcTan[a*x])] - (3*I)*a^3*x^3*PolyLog[2, -E^((2*
I)*ArcTan[a*x])] - (5*I)*a^3*x^3*PolyLog[2, E^((2*I)*ArcTan[a*x])]))/(3*x^3
)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^2/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^4,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.08, size = 375, normalized size = 1.74

$$a^4c^2x\arctan(ax)^2-\frac{c^2\arctan(ax)^2}{3x^3}-\frac{2a^2c^2\arctan(ax)^2}{x}-\frac{a\,c^2\arctan(ax)}{3x^2}+\frac{10a^3c^2\arctan(ax)\ln(ax)}{3}-\frac{8a^3c^2\text{ar}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^2/x^4,x)
[Out] a^4*c^2*x*arctan(a*x)^2-1/3*c^2*arctan(a*x)^2/x^3-2*a^2*c^2*arctan(a*x)^2/x
-1/3*a*c^2*arctan(a*x)/x^2+10/3*a^3*c^2*arctan(a*x)*ln(a*x)-8/3*a^3*c^2*arc
tan(a*x)*ln(a^2*x^2+1)-1/3*a^2*c^2/x-1/3*a^3*c^2*arctan(a*x)+5/3*I*a^3*c^2*
dilog(1+I*a*x)-2/3*I*a^3*c^2*ln(I+a*x)^2+4/3*I*a^3*c^2*ln(a*x-I)*ln(-1/2*I*
(I+a*x))+4/3*I*a^3*c^2*dilog(-1/2*I*(I+a*x))+2/3*I*a^3*c^2*ln(a*x-I)^2+5/3*
I*a^3*c^2*ln(a*x)*ln(1+I*a*x)-4/3*I*a^3*c^2*ln(a*x-I)*ln(a^2*x^2+1)-4/3*I*a
^3*c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))+4/3*I*a^3*c^2*ln(I+a*x)*ln(a^2*x^2+1)-5/
3*I*a^3*c^2*dilog(1-I*a*x)-5/3*I*a^3*c^2*ln(a*x)*ln(1-I*a*x)-4/3*I*a^3*c^2*
dilog(1/2*I*(a*x-I))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^2/x^4,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x^4,x)
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^2)/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int a^4\operatorname{atan}^2(ax)\,dx+\int\frac{\operatorname{atan}^2(ax)}{x^4}\,dx+\int\frac{2a^2\operatorname{atan}^2(ax)}{x^2}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**2/x**4,x)
[Out] c**2*(Integral(a**4*atan(a*x)**2, x) + Integral(atan(a*x)**2/x**4, x) + Int
egral(2*a**2*atan(a*x)**2/x**2, x))
```

3.274 $\int x^3 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=240

$$\frac{1}{10}a^6c^3x^{10}\tan^{-1}(ax)^2-\frac{1}{45}a^5c^3x^9\tan^{-1}(ax)+\frac{1}{360}a^4c^3x^8+\frac{3}{8}a^4c^3x^8\tan^{-1}(ax)^2-\frac{c^3\tan^{-1}(ax)^2}{40a^4}-\frac{11}{140}a^3c^3x^7\tan^{-1}(ax$$

```
[Out] -107/12600*c^3*x^2/a^2+53/6300*c^3*x^4+71/7560*a^2*c^3*x^6+1/360*a^4*c^3*x^
8+1/20*c^3*x*arctan(a*x)/a^3-1/60*c^3*x^3*arctan(a*x)/a-9/100*a*c^3*x^5*arc
tan(a*x)-11/140*a^3*c^3*x^7*arctan(a*x)-1/45*a^5*c^3*x^9*arctan(a*x)-1/40*c
^3*arctan(a*x)^2/a^4+1/4*c^3*x^4*arctan(a*x)^2+1/2*a^2*c^3*x^6*arctan(a*x)^
2+3/8*a^4*c^3*x^8*arctan(a*x)^2+1/10*a^6*c^3*x^10*arctan(a*x)^2-26/1575*c^3
*ln(a^2*x^2+1)/a^4
```

Rubi [A] time = 1.23, antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 72, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4948, 4852, 4916, 266, 43, 4846, 260, 4884}

$$\frac{1}{360}a^4c^3x^8+\frac{71a^2c^3x^6}{7560}-\frac{107c^3x^2}{12600a^2}-\frac{26c^3\log\left(a^2x^2+1\right)}{1575a^4}+\frac{1}{10}a^6c^3x^{10}\tan^{-1}(ax)^2-\frac{1}{45}a^5c^3x^9\tan^{-1}(ax)+\frac{3}{8}a^4c^3x^8\tan^{-1}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (-107*c^3*x^2)/(12600*a^2) + (53*c^3*x^4)/6300 + (71*a^2*c^3*x^6)/7560 + (a
^4*c^3*x^8)/360 + (c^3*x*ArcTan[a*x])/(20*a^3) - (c^3*x^3*ArcTan[a*x])/(60*
a) - (9*a*c^3*x^5*ArcTan[a*x])/100 - (11*a^3*c^3*x^7*ArcTan[a*x])/140 - (a^
5*c^3*x^9*ArcTan[a*x])/45 - (c^3*ArcTan[a*x]^2)/(40*a^4) + (c^3*x^4*ArcTan[
a*x]^2)/4 + (a^2*c^3*x^6*ArcTan[a*x]^2)/2 + (3*a^4*c^3*x^8*ArcTan[a*x]^2)/8
 + (a^6*c^3*x^10*ArcTan[a*x]^2)/10 - (26*c^3*Log[1 + a^2*x^2])/(1575*a^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
 :> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
```

```
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2\,dx = \int\left(c^3x^3\tan^{-1}(ax)^2+3a^2c^3x^5\tan^{-1}(ax)^2+3a^4c^3x^7\tan^{-1}(ax)^2+a^6c^3x^9\tan\right.$$

$$= c^3\int x^3\tan^{-1}(ax)^2\,dx+\left(3a^2c^3\right)\int x^5\tan^{-1}(ax)^2\,dx+\left(3a^4c^3\right)\int x^7\tan^{-1}(a$$

$$= \frac{1}{4}c^3x^4\tan^{-1}(ax)^2+\frac{1}{2}a^2c^3x^6\tan^{-1}(ax)^2+\frac{3}{8}a^4c^3x^8\tan^{-1}(ax)^2+\frac{1}{10}a^6c^3x^{10}$$

$$= \frac{1}{4}c^3x^4\tan^{-1}(ax)^2+\frac{1}{2}a^2c^3x^6\tan^{-1}(ax)^2+\frac{3}{8}a^4c^3x^8\tan^{-1}(ax)^2+\frac{1}{10}a^6c^3x^{10}$$

$$= -\frac{c^3x^3\tan^{-1}(ax)}{6a}-\frac{1}{5}ac^3x^5\tan^{-1}(ax)-\frac{3}{28}a^3c^3x^7\tan^{-1}(ax)-\frac{1}{45}a^5c^3x^9\tan$$

$$= \frac{c^3x\tan^{-1}(ax)}{2a^3}+\frac{c^3x^3\tan^{-1}(ax)}{6a}-\frac{1}{20}ac^3x^5\tan^{-1}(ax)-\frac{11}{140}a^3c^3x^7\tan^{-1}(ax$$

$$= -\frac{c^3x\tan^{-1}(ax)}{2a^3}-\frac{c^3x^3\tan^{-1}(ax)}{12a}-\frac{9}{100}ac^3x^5\tan^{-1}(ax)-\frac{11}{140}a^3c^3x^7\tan^{-1}($$

$$= \frac{13c^3x^2}{504a^2}+\frac{29c^3x^4}{1008}+\frac{107a^2c^3x^6}{7560}+\frac{1}{360}a^4c^3x^8+\frac{c^3x\tan^{-1}(ax)}{4a^3}-\frac{c^3x^3\tan^{-1}(}{60a}$$

$$= -\frac{101c^3x^2}{1260a^2}-\frac{c^3x^4}{630}+\frac{71a^2c^3x^6}{7560}+\frac{1}{360}a^4c^3x^8+\frac{c^3x\tan^{-1}(ax)}{20a^3}-\frac{c^3x^3\tan^{-1}(a}{60a}$$

$$= \frac{313c^3x^2}{12600a^2}+\frac{53c^3x^4}{6300}+\frac{71a^2c^3x^6}{7560}+\frac{1}{360}a^4c^3x^8+\frac{c^3x\tan^{-1}(ax)}{20a^3}-\frac{c^3x^3\tan^{-1}(}{60a}$$

$$= -\frac{107c^3x^2}{12600a^2}+\frac{53c^3x^4}{6300}+\frac{71a^2c^3x^6}{7560}+\frac{1}{360}a^4c^3x^8+\frac{c^3x\tan^{-1}(ax)}{20a^3}-\frac{c^3x^3\tan^{-}}{60a}$$

Mathematica [A] time = 0.10, size = 126, normalized size = 0.52

$$\frac{c^3\left(105a^8x^8+355a^6x^6+318a^4x^4-321a^2x^2-624\log\left(a^2x^2+1\right)+945\left(a^2x^2+1\right)^4\left(4a^2x^2-1\right)\tan^{-1}(ax)^2-6ax}{37800a^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (c^3*(-321*a^2*x^2 + 318*a^4*x^4 + 355*a^6*x^6 + 105*a^8*x^8 - 6*a*x*(-315
+ 105*a^2*x^2 + 567*a^4*x^4 + 495*a^6*x^6 + 140*a^8*x^8)*ArcTan[a*x] + 945*
(1 + a^2*x^2)^4*(-1 + 4*a^2*x^2)*ArcTan[a*x]^2 - 624*Log[1 + a^2*x^2]))/(37
800*a^4)
```

fricas [A] time = 0.68, size = 181, normalized size = 0.75

$$\frac{105\,a^8c^3x^8+355\,a^6c^3x^6+318\,a^4c^3x^4-321\,a^2c^3x^2-624\,c^3\log\left(a^2x^2+1\right)+945\left(4\,a^{10}c^3x^{10}+15\,a^8c^3x^8+20\,a^6c}{378}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/37800*(105*a^8*c^3*x^8 + 355*a^6*c^3*x^6 + 318*a^4*c^3*x^4 - 321*a^2*c^3*
x^2 - 624*c^3*log(a^2*x^2 + 1) + 945*(4*a^10*c^3*x^10 + 15*a^8*c^3*x^8 + 20
*a^6*c^3*x^6 + 10*a^4*c^3*x^4 - c^3)*arctan(a*x)^2 - 6*(140*a^9*c^3*x^9 + 4
95*a^7*c^3*x^7 + 567*a^5*c^3*x^5 + 105*a^3*c^3*x^3 - 315*a*c^3*x)*arctan(a*
x))/a^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 211, normalized size = 0.88

$$-\frac{107c^3x^2}{12600a^2}+\frac{53c^3x^4}{6300}+\frac{71a^2c^3x^6}{7560}+\frac{a^4c^3x^8}{360}+\frac{c^3x\arctan(ax)}{20a^3}-\frac{c^3x^3\arctan(ax)}{60a}-\frac{9a\,c^3x^5\arctan(ax)}{100}-\frac{11a^3c^3x^7\arctan}{140}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^2,x)
```

```
[Out] -107/12600*c^3*x^2/a^2+53/6300*c^3*x^4+71/7560*a^2*c^3*x^6+1/360*a^4*c^3*x^
8+1/20*c^3*x*arctan(a*x)/a^3-1/60*c^3*x^3*arctan(a*x)/a-9/100*a*c^3*x^5*arc
tan(a*x)-11/140*a^3*c^3*x^7*arctan(a*x)-1/45*a^5*c^3*x^9*arctan(a*x)-1/40*c
^3*arctan(a*x)^2/a^4+1/4*c^3*x^4*arctan(a*x)^2+1/2*a^2*c^3*x^6*arctan(a*x)^
2+3/8*a^4*c^3*x^8*arctan(a*x)^2+1/10*a^6*c^3*x^10*arctan(a*x)^2-26/1575*c^3
*ln(a^2*x^2+1)/a^4
```

maxima [A] time = 0.42, size = 202, normalized size = 0.84

$$-\frac{1}{6300}a\left(\frac{315\,c^3\arctan(ax)}{a^5}+\frac{140\,a^8c^3x^9+495\,a^6c^3x^7+567\,a^4c^3x^5+105\,a^2c^3x^3-315\,c^3x}{a^4}\right)\arctan(ax)+\frac{1}{40}\left(4\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -1/6300*a*(315*c^3*arctan(a*x)/a^5 + (140*a^8*c^3*x^9 + 495*a^6*c^3*x^7 + 5
67*a^4*c^3*x^5 + 105*a^2*c^3*x^3 - 315*c^3*x)/a^4)*arctan(a*x) + 1/40*(4*a^
6*c^3*x^10 + 15*a^4*c^3*x^8 + 20*a^2*c^3*x^6 + 10*c^3*x^4)*arctan(a*x)^2 +
1/37800*(105*a^8*c^3*x^8 + 355*a^6*c^3*x^6 + 318*a^4*c^3*x^4 - 321*a^2*c^3*
x^2 + 945*c^3*arctan(a*x)^2 - 624*c^3*log(a^2*x^2 + 1))/a^4
```

mupad [B] time = 0.51, size = 178, normalized size = 0.74

$$\operatorname{atan}(a\,x)^2\left(\frac{c^3\,x^4}{4}-\frac{c^3}{40\,a^4}+\frac{a^2\,c^3\,x^6}{2}+\frac{3\,a^4\,c^3\,x^8}{8}+\frac{a^6\,c^3\,x^{10}}{10}\right)+\frac{53\,c^3\,x^4}{6300}-\frac{26\,c^3\,\ln\left(a^2\,x^2+1\right)}{1575\,a^4}-\frac{107\,c^3\,x^2}{12600\,a^2}+\frac{71\,a^2}{75\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^3,x)
```

```
[Out] atan(a*x)^2*((c^3*x^4)/4 - c^3/(40*a^4) + (a^2*c^3*x^6)/2 + (3*a^4*c^3*x^8)
/8 + (a^6*c^3*x^10)/10) + (53*c^3*x^4)/6300 - (26*c^3*log(a^2*x^2 + 1))/(15
75*a^4) - (107*c^3*x^2)/(12600*a^2) + (71*a^2*c^3*x^6)/7560 + (a^4*c^3*x^8)
/360 - a^2*atan(a*x)*((11*a*c^3*x^7)/140 - (c^3*x)/(20*a^5) + (9*c^3*x^5)/(
100*a) + (c^3*x^3)/(60*a^3) + (a^3*c^3*x^9)/45)
```

sympy [A] time = 4.97, size = 241, normalized size = 1.00

$$\begin{cases} \frac{a^6c^3x^{10}\operatorname{atan}^2(ax)}{10}-\frac{a^5c^3x^9\operatorname{atan}(ax)}{45}+\frac{3a^4c^3x^8\operatorname{atan}^2(ax)}{8}+\frac{a^4c^3x^8}{360}-\frac{11a^3c^3x^7\operatorname{atan}(ax)}{140}+\frac{a^2c^3x^6\operatorname{atan}^2(ax)}{2}+\frac{71a^2c^3x^6}{7560}-\frac{9ac^3x^5\operatorname{ata}\cdots}{100\cdots} \\ 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**3*atan(a*x)**2,x)
```

```
[Out] Piecewise((a**6*c**3*x**10*atan(a*x)**2/10 - a**5*c**3*x**9*atan(a*x)/45 +
3*a**4*c**3*x**8*atan(a*x)**2/8 + a**4*c**3*x**8/360 - 11*a**3*c**3*x**7*at
an(a*x)/140 + a**2*c**3*x**6*atan(a*x)**2/2 + 71*a**2*c**3*x**6/7560 - 9*a*
c**3*x**5*atan(a*x)/100 + c**3*x**4*atan(a*x)**2/4 + 53*c**3*x**4/6300 - c*
*3*x**3*atan(a*x)/(60*a) - 107*c**3*x**2/(12600*a**2) + c**3*x*atan(a*x)/(2
0*a**3) - 26*c**3*log(x**2 + a**(-2))/(1575*a**4) - c**3*atan(a*x)**2/(40*a
**4), Ne(a, 0)), (0, True))
```

3.275 $\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(a x)^2 \, dx$

Optimal. Leaf size=274

$$\frac{1}{9}a^6c^3x^9\tan^{-1}(ax)^2-\frac{1}{36}a^5c^3x^8\tan^{-1}(ax)+\frac{1}{252}a^4c^3x^7+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)^2-\frac{16ic^3\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{315a^3}-\frac{20}{189}a^3c^3x^6\tan^{-}$$

```
[Out] -47/3780*c^3*x/a^2+239/11340*c^3*x^3+59/3780*a^2*c^3*x^5+1/252*a^4*c^3*x^7+
47/3780*c^3*arctan(a*x)/a^3-16/315*c^3*x^2*arctan(a*x)/a-89/630*a*c^3*x^4*a
rctan(a*x)-20/189*a^3*c^3*x^6*arctan(a*x)-1/36*a^5*c^3*x^8*arctan(a*x)-16/3
15*I*c^3*arctan(a*x)^2/a^3+1/3*c^3*x^3*arctan(a*x)^2+3/5*a^2*c^3*x^5*arctan
(a*x)^2+3/7*a^4*c^3*x^7*arctan(a*x)^2+1/9*a^6*c^3*x^9*arctan(a*x)^2-32/315*
c^3*arctan(a*x)*ln(2/(1+I*a*x))/a^3-16/315*I*c^3*polylog(2,1-2/(1+I*a*x))/a
^3
```

Rubi [A] time = 1.15, antiderivative size = 274, normalized size of antiderivative = 1.00, number of steps used = 68, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4948, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 302}

$$-\frac{16ic^3\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{315a^3}+\frac{1}{252}a^4c^3x^7+\frac{59a^2c^3x^5}{3780}+\frac{1}{9}a^6c^3x^9\tan^{-1}(ax)^2-\frac{1}{36}a^5c^3x^8\tan^{-1}(ax)+\frac{3}{7}a^4c^3x^7\tan^{-1}(a$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (-47*c^3*x)/(3780*a^2) + (239*c^3*x^3)/11340 + (59*a^2*c^3*x^5)/3780 + (a^4
*c^3*x^7)/252 + (47*c^3*ArcTan[a*x])/(3780*a^3) - (16*c^3*x^2*ArcTan[a*x])/
(315*a) - (89*a*c^3*x^4*ArcTan[a*x])/630 - (20*a^3*c^3*x^6*ArcTan[a*x])/189
 - (a^5*c^3*x^8*ArcTan[a*x])/36 - (((16*I)/315)*c^3*ArcTan[a*x]^2)/a^3 + (c
^3*x^3*ArcTan[a*x]^2)/3 + (3*a^2*c^3*x^5*ArcTan[a*x]^2)/5 + (3*a^4*c^3*x^7*
ArcTan[a*x]^2)/7 + (a^6*c^3*x^9*ArcTan[a*x]^2)/9 - (32*c^3*ArcTan[a*x]*Log[
2/(1 + I*a*x)])/(315*a^3) - (((16*I)/315)*c^3*PolyLog[2, 1 - 2/(1 + I*a*x)]
)/a^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^2 \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2\,dx = \int \left(c^3x^2\tan^{-1}(ax)^2 + 3a^2c^3x^4\tan^{-1}(ax)^2 + 3a^4c^3x^6\tan^{-1}(ax)^2 + a^6c^3x^8\tan^{-1}\right.$$

$$= c^3\int x^2\tan^{-1}(ax)^2\,dx + \left(3a^2c^3\right)\int x^4\tan^{-1}(ax)^2\,dx + \left(3a^4c^3\right)\int x^6\tan^{-1}(ax)^2$$

$$= \frac{1}{3}c^3x^3\tan^{-1}(ax)^2 + \frac{3}{5}a^2c^3x^5\tan^{-1}(ax)^2 + \frac{3}{7}a^4c^3x^7\tan^{-1}(ax)^2 + \frac{1}{9}a^6c^3x^9\tan^{-1}$$

$$= \frac{1}{3}c^3x^3\tan^{-1}(ax)^2 + \frac{3}{5}a^2c^3x^5\tan^{-1}(ax)^2 + \frac{3}{7}a^4c^3x^7\tan^{-1}(ax)^2 + \frac{1}{9}a^6c^3x^9\tan^{-1}$$

$$= -\frac{c^3x^2\tan^{-1}(ax)}{3a} - \frac{3}{10}ac^3x^4\tan^{-1}(ax) - \frac{1}{7}a^3c^3x^6\tan^{-1}(ax) - \frac{1}{36}a^5c^3x^8\tan^{-1}($$

$$= \frac{c^3x}{3a^2} + \frac{4c^3x^2\tan^{-1}(ax)}{15a} - \frac{3}{35}ac^3x^4\tan^{-1}(ax) - \frac{20}{189}a^3c^3x^6\tan^{-1}(ax) - \frac{1}{36}a^5c^3$$

$$= -\frac{569c^3x}{1260a^2} + \frac{233c^3x^3}{3780} + \frac{29a^2c^3x^5}{1260} + \frac{1}{252}a^4c^3x^7 - \frac{c^3\tan^{-1}(ax)}{3a^3} - \frac{17c^3x^2\tan^{-1}(}{105a}$$

$$= \frac{583c^3x}{3780a^2} + \frac{29c^3x^3}{11340} + \frac{59a^2c^3x^5}{3780} + \frac{1}{252}a^4c^3x^7 + \frac{569c^3\tan^{-1}(ax)}{1260a^3} - \frac{16c^3x^2\tan^{-1}}{315a}$$

$$= -\frac{47c^3x}{3780a^2} + \frac{239c^3x^3}{11340} + \frac{59a^2c^3x^5}{3780} + \frac{1}{252}a^4c^3x^7 - \frac{583c^3\tan^{-1}(ax)}{3780a^3} - \frac{16c^3x^2\tan}{315}$$

$$= -\frac{47c^3x}{3780a^2} + \frac{239c^3x^3}{11340} + \frac{59a^2c^3x^5}{3780} + \frac{1}{252}a^4c^3x^7 + \frac{47c^3\tan^{-1}(ax)}{3780a^3} - \frac{16c^3x^2\tan}{315a}$$

$$= -\frac{47c^3x}{3780a^2} + \frac{239c^3x^3}{11340} + \frac{59a^2c^3x^5}{3780} + \frac{1}{252}a^4c^3x^7 + \frac{47c^3\tan^{-1}(ax)}{3780a^3} - \frac{16c^3x^2\tan}{315a}$$

Mathematica [A] time = 2.26, size = 157, normalized size = 0.57

$$\frac{c^3\left(ax\left(45a^6x^6+177a^4x^4+239a^2x^2-141\right)+36\left(35a^9x^9+135a^7x^7+189a^5x^5+105a^3x^3+16i\right)\tan^{-1}(ax)^2-3\,\mathrm{t}\right.}{11340}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (c^3*(a*x*(-141 + 239*a^2*x^2 + 177*a^4*x^4 + 45*a^6*x^6) + 36*(16*I + 105*
a^3*x^3 + 189*a^5*x^5 + 135*a^7*x^7 + 35*a^9*x^9)*ArcTan[a*x]^2 - 3*ArcTan[
a*x]*(-47 + 192*a^2*x^2 + 534*a^4*x^4 + 400*a^6*x^6 + 105*a^8*x^8 + 384*Log
[1 + E^((2*I)*ArcTan[a*x])]) + (576*I)*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))
/(11340*a^3)
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2\right)\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4 + c^3*x^2)*arctan(a*x
)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.10, size = 376, normalized size = 1.37

$$\frac{a^6c^3x^9\arctan(ax)^2}{9}+\frac{3a^4c^3x^7\arctan(ax)^2}{7}+\frac{3a^2c^3x^5\arctan(ax)^2}{5}+\frac{c^3x^3\arctan(ax)^2}{3}-\frac{a^5c^3x^8\arctan(ax)}{36}-\frac{20a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^2,x)
```

```
[Out] 1/9*a^6*c^3*x^9*arctan(a*x)^2+3/7*a^4*c^3*x^7*arctan(a*x)^2+3/5*a^2*c^3*x^5
*arctan(a*x)^2+1/3*c^3*x^3*arctan(a*x)^2-1/36*a^5*c^3*x^8*arctan(a*x)-20/18
9*a^3*c^3*x^6*arctan(a*x)-89/630*a*c^3*x^4*arctan(a*x)-16/315*c^3*x^2*arcta
n(a*x)/a+16/315/a^3*c^3*arctan(a*x)*ln(a^2*x^2+1)+1/252*a^4*c^3*x^7+59/3780
*a^2*c^3*x^5+239/11340*c^3*x^3-47/3780*c^3*x/a^2+47/3780*c^3*arctan(a*x)/a^
3-8/315*I/a^3*c^3*ln(I+a*x)*ln(a^2*x^2+1)+8/315*I/a^3*c^3*dilog(1/2*I*(a*x-
I))-4/315*I/a^3*c^3*ln(a*x-I)^2+8/315*I/a^3*c^3*ln(a*x-I)*ln(a^2*x^2+1)-8/3
15*I/a^3*c^3*ln(a*x-I)*ln(-1/2*I*(I+a*x))+4/315*I/a^3*c^3*ln(I+a*x)^2-8/315
*I/a^3*c^3*dilog(-1/2*I*(I+a*x))+8/315*I/a^3*c^3*ln(I+a*x)*ln(1/2*I*(a*x-I)
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{1260}\left(35\,a^6c^3x^9+135\,a^4c^3x^7+189\,a^2c^3x^5+105\,c^3x^3\right)\arctan(ax)^2-\frac{1}{5040}\left(35\,a^6c^3x^9+135\,a^4c^3x^7+189\,a^2c^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/1260*(35*a^6*c^3*x^9 + 135*a^4*c^3*x^7 + 189*a^2*c^3*x^5 + 105*c^3*x^3)*a
rctan(a*x)^2 - 1/5040*(35*a^6*c^3*x^9 + 135*a^4*c^3*x^7 + 189*a^2*c^3*x^5 +
 105*c^3*x^3)*log(a^2*x^2 + 1)^2 + integrate(1/5040*(3780*(a^8*c^3*x^10 + 4
*a^6*c^3*x^8 + 6*a^4*c^3*x^6 + 4*a^2*c^3*x^4 + c^3*x^2)*arctan(a*x)^2 + 315
*(a^8*c^3*x^10 + 4*a^6*c^3*x^8 + 6*a^4*c^3*x^6 + 4*a^2*c^3*x^4 + c^3*x^2)*l
og(a^2*x^2 + 1)^2 - 8*(35*a^7*c^3*x^9 + 135*a^5*c^3*x^7 + 189*a^3*c^3*x^5 +
 105*a*c^3*x^3)*arctan(a*x) + 4*(35*a^8*c^3*x^10 + 135*a^6*c^3*x^8 + 189*a^
4*c^3*x^6 + 105*a^2*c^3*x^4)*log(a^2*x^2 + 1))/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int x^2\operatorname{atan}^2(ax)\,dx+\int 3a^2x^4\operatorname{atan}^2(ax)\,dx+\int 3a^4x^6\operatorname{atan}^2(ax)\,dx+\int a^6x^8\operatorname{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**3*atan(a*x)**2,x)
```

```
[Out] c**3*(Integral(x**2*atan(a*x)**2, x) + Integral(3*a**2*x**4*atan(a*x)**2, x
) + Integral(3*a**4*x**6*atan(a*x)**2, x) + Integral(a**6*x**8*atan(a*x)**2
, x))
```

3.276 $\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=200

$$\frac{c^3\left(a^2x^2+1\right)^3}{168a^2}+\frac{3c^3\left(a^2x^2+1\right)^2}{280a^2}+\frac{c^3\left(a^2x^2+1\right)}{35a^2}+\frac{2c^3\log\left(a^2x^2+1\right)}{35a^2}+\frac{c^3\left(a^2x^2+1\right)^4\tan^{-1}(ax)^2}{8a^2}-\frac{c^3x\left(a^2x^2+1\right)^3}{28a}$$

```
[Out] 1/35*c^3*(a^2*x^2+1)/a^2+3/280*c^3*(a^2*x^2+1)^2/a^2+1/168*c^3*(a^2*x^2+1)^
3/a^2-4/35*c^3*x*arctan(a*x)/a-2/35*c^3*x*(a^2*x^2+1)*arctan(a*x)/a-3/70*c^
3*x*(a^2*x^2+1)^2*arctan(a*x)/a-1/28*c^3*x*(a^2*x^2+1)^3*arctan(a*x)/a+1/8*
c^3*(a^2*x^2+1)^4*arctan(a*x)^2/a^2+2/35*c^3*ln(a^2*x^2+1)/a^2
```

Rubi [A] time = 0.12, antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4930, 4878, 4846, 260}

$$\frac{c^3\left(a^2x^2+1\right)^3}{168a^2}+\frac{3c^3\left(a^2x^2+1\right)^2}{280a^2}+\frac{c^3\left(a^2x^2+1\right)}{35a^2}+\frac{2c^3\log\left(a^2x^2+1\right)}{35a^2}+\frac{c^3\left(a^2x^2+1\right)^4\tan^{-1}(ax)^2}{8a^2}-\frac{c^3x\left(a^2x^2+1\right)^3}{28a}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (c^3*(1 + a^2*x^2))/(35*a^2) + (3*c^3*(1 + a^2*x^2)^2)/(280*a^2) + (c^3*(1
+ a^2*x^2)^3)/(168*a^2) - (4*c^3*x*ArcTan[a*x])/(35*a) - (2*c^3*x*(1 + a^2*
x^2)*ArcTan[a*x])/(35*a) - (3*c^3*x*(1 + a^2*x^2)^2*ArcTan[a*x])/(70*a) - (
c^3*x*(1 + a^2*x^2)^3*ArcTan[a*x])/(28*a) + (c^3*(1 + a^2*x^2)^4*ArcTan[a*x
]^2)/(8*a^2) + (2*c^3*Log[1 + a^2*x^2])/(35*a^2)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2\,dx = \frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)^2}{8a^2} - \frac{\int\left(c+a^2cx^2\right)^3\tan^{-1}(ax)\,dx}{4a}$$
$$= \frac{c^3\left(1+a^2x^2\right)^3}{168a^2} - \frac{c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)}{28a} + \frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)^2}{8a^2} - (3c)$$
$$= \frac{3c^3\left(1+a^2x^2\right)^2}{280a^2} + \frac{c^3\left(1+a^2x^2\right)^3}{168a^2} - \frac{3c^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{70a} - \frac{c^3x\left(1+a^2x^2\right)}{28}$$
$$= \frac{c^3\left(1+a^2x^2\right)}{35a^2} + \frac{3c^3\left(1+a^2x^2\right)^2}{280a^2} + \frac{c^3\left(1+a^2x^2\right)^3}{168a^2} - \frac{2c^3x\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a}$$
$$= \frac{c^3\left(1+a^2x^2\right)}{35a^2} + \frac{3c^3\left(1+a^2x^2\right)^2}{280a^2} + \frac{c^3\left(1+a^2x^2\right)^3}{168a^2} - \frac{4c^3x\tan^{-1}(ax)}{35a} - \frac{2c^3x\left(1+\right.}{}$$
$$= \frac{c^3\left(1+a^2x^2\right)}{35a^2} + \frac{3c^3\left(1+a^2x^2\right)^2}{280a^2} + \frac{c^3\left(1+a^2x^2\right)^3}{168a^2} - \frac{4c^3x\tan^{-1}(ax)}{35a} - \frac{2c^3x\left(1+\right.}{}$$

Mathematica [A] time = 0.09, size = 100, normalized size = 0.50

$$\frac{c^3\left(5a^6x^6+24a^4x^4+57a^2x^2+48\log\left(a^2x^2+1\right)+105\left(a^2x^2+1\right)^4\tan^{-1}(ax)^2-6ax\left(5a^6x^6+21a^4x^4+35a^2x^2+\right.\right.}{840a^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (c^3*(57*a^2*x^2 + 24*a^4*x^4 + 5*a^6*x^6 - 6*a*x*(35 + 35*a^2*x^2 + 21*a^4
*x^4 + 5*a^6*x^6)*ArcTan[a*x] + 105*(1 + a^2*x^2)^4*ArcTan[a*x]^2 + 48*Log[
1 + a^2*x^2]))/(840*a^2)
```

fricas [A] time = 0.66, size = 156, normalized size = 0.78

$$\frac{5\,a^6c^3x^6+24\,a^4c^3x^4+57\,a^2c^3x^2+48\,c^3\log\left(a^2x^2+1\right)+105\left(a^8c^3x^8+4\,a^6c^3x^6+6\,a^4c^3x^4+4\,a^2c^3x^2+c^3\right)\mathrm{arct}}{840\,a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/840*(5*a^6*c^3*x^6 + 24*a^4*c^3*x^4 + 57*a^2*c^3*x^2 + 48*c^3*log(a^2*x^2
 + 1) + 105*(a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2 +
c^3)*arctan(a*x)^2 - 6*(5*a^7*c^3*x^7 + 21*a^5*c^3*x^5 + 35*a^3*c^3*x^3 + 3
5*a*c^3*x)*arctan(a*x))/a^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 185, normalized size = 0.92

$$\frac{a^6c^3\arctan(ax)^2x^8}{8}+\frac{a^4c^3\arctan(ax)^2x^6}{2}+\frac{3a^2c^3\arctan(ax)^2x^4}{4}+\frac{c^3\arctan(ax)^2x^2}{2}-\frac{a^5c^3\arctan(ax)x^7}{28}-\frac{3a^3c^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^2,x)
```

```
[Out] 1/8*a^6*c^3*arctan(a*x)^2*x^8+1/2*a^4*c^3*arctan(a*x)^2*x^6+3/4*a^2*c^3*arc
tan(a*x)^2*x^4+1/2*c^3*arctan(a*x)^2*x^2-1/28*a^5*c^3*arctan(a*x)*x^7-3/20*
a^3*c^3*arctan(a*x)*x^5-1/4*a*c^3*arctan(a*x)*x^3-1/4*c^3*x*arctan(a*x)/a+1
/8/a^2*c^3*arctan(a*x)^2+1/168*a^4*c^3*x^6+1/35*a^2*x^4*c^3+19/280*x^2*c^3+
2/35*c^3*ln(a^2*x^2+1)/a^2
```

maxima [A] time = 0.32, size = 133, normalized size = 0.66

$$\frac{\left(a^2cx^2+c\right)^4\arctan\left(ax\right)^2}{8\,a^2c}+\frac{\left(5\,a^4c^4x^6+24\,a^2c^4x^4+57\,c^4x^2+\frac{48\,c^4\log\left(a^2x^2+1\right)}{a^2}\right)a-6\left(5\,a^6c^4x^7+21\,a^4c^4x^5+35\,a\right.}{840\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/8*(a^2*c*x^2 + c)^4*arctan(a*x)^2/(a^2*c) + 1/840*((5*a^4*c^4*x^6 + 24*a^
2*c^4*x^4 + 57*c^4*x^2 + 48*c^4*log(a^2*x^2 + 1)/a^2)*a - 6*(5*a^6*c^4*x^7
+ 21*a^4*c^4*x^5 + 35*a^2*c^4*x^3 + 35*c^4*x)*arctan(a*x))/(a*c)
```

mupad [B] time = 0.46, size = 156, normalized size = 0.78

$$\mathrm{atan}\left(a\,x\right)^2\,\left(\frac{c^3}{8\,a^2}+\frac{c^3\,x^2}{2}+\frac{3\,a^2\,c^3\,x^4}{4}+\frac{a^4\,c^3\,x^6}{2}+\frac{a^6\,c^3\,x^8}{8}\right)+\frac{19\,c^3\,x^2}{280}-a^2\,\mathrm{atan}\left(a\,x\right)\,\left(\frac{c^3\,x}{4\,a^3}+\frac{3\,a\,c^3\,x^5}{20}+\frac{c^3\,x^3}{4\,a}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^2*(c + a^2*c*x^2)^3,x)
```

```
[Out] atan(a*x)^2*(c^3/(8*a^2) + (c^3*x^2)/2 + (3*a^2*c^3*x^4)/4 + (a^4*c^3*x^6)/
2 + (a^6*c^3*x^8)/8) + (19*c^3*x^2)/280 - a^2*atan(a*x)*((c^3*x)/(4*a^3) +
(3*a*c^3*x^5)/20 + (c^3*x^3)/(4*a) + (a^3*c^3*x^7)/28) + (2*c^3*log(a^2*x^2
 + 1))/(35*a^2) + (a^2*c^3*x^4)/35 + (a^4*c^3*x^6)/168
```

sympy [A] time = 3.29, size = 207, normalized size = 1.04

$$\begin{cases}\frac{a^6c^3x^8\,\mathrm{atan}^2\left(ax\right)}{8}-\frac{a^5c^3x^7\,\mathrm{atan}\left(ax\right)}{28}+\frac{a^4c^3x^6\,\mathrm{atan}^2\left(ax\right)}{2}+\frac{a^4c^3x^6}{168}-\frac{3a^3c^3x^5\,\mathrm{atan}\left(ax\right)}{20}+\frac{3a^2c^3x^4\,\mathrm{atan}^2\left(ax\right)}{4}+\frac{a^2c^3x^4}{35}-\frac{ac^3x^3\,\mathrm{atan}\left(ax\right)}{4} \\ 0\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3*atan(a*x)**2,x)
```

```
[Out] Piecewise((a**6*c**3*x**8*atan(a*x)**2/8 - a**5*c**3*x**7*atan(a*x)/28 + a*
*4*c**3*x**6*atan(a*x)**2/2 + a**4*c**3*x**6/168 - 3*a**3*c**3*x**5*atan(a*
x)/20 + 3*a**2*c**3*x**4*atan(a*x)**2/4 + a**2*c**3*x**4/35 - a*c**3*x**3*a
tan(a*x)/4 + c**3*x**2*atan(a*x)**2/2 + 19*c**3*x**2/280 - c**3*x*atan(a*x)
/(4*a) + 2*c**3*log(x**2 + a**(-2))/(35*a**2) + c**3*atan(a*x)**2/(8*a**2),
 Ne(a, 0)), (0, True))
```

3.277 $\int \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=268

$$\frac{1}{105}a^4c^3x^5+\frac{19}{315}a^2c^3x^3+\frac{1}{7}c^3x\left(a^2x^2+1\right)^3\tan^{-1}(ax)^2+\frac{6}{35}c^3x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2+\frac{8}{35}c^3x\left(a^2x^2+1\right)\tan^{-1}(ax)^2$$

```
[Out] 38/105*c^3*x+19/315*a^2*c^3*x^3+1/105*a^4*c^3*x^5-8/35*c^3*(a^2*x^2+1)*arct
an(a*x)/a-3/35*c^3*(a^2*x^2+1)^2*arctan(a*x)/a-1/21*c^3*(a^2*x^2+1)^3*arcta
n(a*x)/a+16/35*I*c^3*arctan(a*x)^2/a+16/35*c^3*x*arctan(a*x)^2+8/35*c^3*x*(
a^2*x^2+1)*arctan(a*x)^2+6/35*c^3*x*(a^2*x^2+1)^2*arctan(a*x)^2+1/7*c^3*x*(
a^2*x^2+1)^3*arctan(a*x)^2+32/35*c^3*arctan(a*x)*ln(2/(1+I*a*x))/a+16/35*I*
c^3*polylog(2,1-2/(1+I*a*x))/a
```

Rubi [A] time = 0.18, antiderivative size = 268, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421, Rules used = {4880, 4846, 4920, 4854, 2402, 2315, 8, 194}

$$\frac{16ic^3\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{35a}+\frac{1}{105}a^4c^3x^5+\frac{19}{315}a^2c^3x^3+\frac{1}{7}c^3x\left(a^2x^2+1\right)^3\tan^{-1}(ax)^2+\frac{6}{35}c^3x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (38*c^3*x)/105 + (19*a^2*c^3*x^3)/315 + (a^4*c^3*x^5)/105 - (8*c^3*(1 + a^2
*x^2)*ArcTan[a*x])/(35*a) - (3*c^3*(1 + a^2*x^2)^2*ArcTan[a*x])/(35*a) - (c
^3*(1 + a^2*x^2)^3*ArcTan[a*x])/(21*a) + (((16*I)/35)*c^3*ArcTan[a*x]^2)/a
+ (16*c^3*x*ArcTan[a*x]^2)/35 + (8*c^3*x*(1 + a^2*x^2)*ArcTan[a*x]^2)/35 +
(6*c^3*x*(1 + a^2*x^2)^2*ArcTan[a*x]^2)/35 + (c^3*x*(1 + a^2*x^2)^3*ArcTan[
a*x]^2)/7 + (32*c^3*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(35*a) + (((16*I)/35)*c
^3*PolyLog[2, 1 - 2/(1 + I*a*x)])/a
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2\,dx &= -\frac{c^3\left(1+a^2x^2\right)^3\tan^{-1}(ax)}{21a}+\frac{1}{7}c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)^2+\frac{1}{21}c\int\left(c+a^2cx^2\right)\\ &= -\frac{3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{35a}-\frac{c^3\left(1+a^2x^2\right)^3\tan^{-1}(ax)}{21a}+\frac{6}{35}c^3x\left(1+a^2x^2\right)^2\text{ta}\\ &= \frac{2c^3x}{15}+\frac{19}{315}a^2c^3x^3+\frac{1}{105}a^4c^3x^5-\frac{8c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{35a}\\ &= \frac{38c^3x}{105}+\frac{19}{315}a^2c^3x^3+\frac{1}{105}a^4c^3x^5-\frac{8c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{35a}\\ &= \frac{38c^3x}{105}+\frac{19}{315}a^2c^3x^3+\frac{1}{105}a^4c^3x^5-\frac{8c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{35a}\\ &= \frac{38c^3x}{105}+\frac{19}{315}a^2c^3x^3+\frac{1}{105}a^4c^3x^5-\frac{8c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{35a}\\ &= \frac{38c^3x}{105}+\frac{19}{315}a^2c^3x^3+\frac{1}{105}a^4c^3x^5-\frac{8c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{35a}\\ &= \frac{38c^3x}{105}+\frac{19}{315}a^2c^3x^3+\frac{1}{105}a^4c^3x^5-\frac{8c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a}-\frac{3c^3\left(1+a^2x^2\right)^2}{35a}\end{aligned}$$

Mathematica [A] time = 1.26, size = 137, normalized size = 0.51

$$\frac{c^3\left(ax\left(3a^4x^4+19a^2x^2+114\right)+9\left(5a^7x^7+21a^5x^5+35a^3x^3+35ax-16i\right)\tan^{-1}(ax)^2-3\tan^{-1}(ax)\left(5a^6x^6+\right.\right.}{315a}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^3*ArcTan[a*x]^2,x]
```

```
[Out] (c^3*(a*x*(114 + 19*a^2*x^2 + 3*a^4*x^4) + 9*(-16*I + 35*a*x + 35*a^3*x^3 +
 21*a^5*x^5 + 5*a^7*x^7)*ArcTan[a*x]^2 - 3*ArcTan[a*x]*(38 + 57*a^2*x^2 + 2
4*a^4*x^4 + 5*a^6*x^6 - 96*Log[1 + E^((2*I)*ArcTan[a*x])]) - (144*I)*PolyLo
g[2, -E^((2*I)*ArcTan[a*x])]))/(315*a)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^2,
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.11, size = 346, normalized size = 1.29

$$\frac{a^6c^3\arctan\left(ax\right)^2x^7}{7}+\frac{3a^4c^3\arctan\left(ax\right)^2x^5}{5}+a^2c^3\arctan\left(ax\right)^2x^3+c^3x\arctan\left(ax\right)^2-\frac{a^5c^3\arctan\left(ax\right)x^6}{21}-\frac{8a^3c^3\text{ar}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^2,x)
```

```
[Out] 1/7*a^6*c^3*arctan(a*x)^2*x^7+3/5*a^4*c^3*arctan(a*x)^2*x^5+a^2*c^3*arctan(
a*x)^2*x^3+c^3*x*arctan(a*x)^2-1/21*a^5*c^3*arctan(a*x)*x^6-8/35*a^3*c^3*ar
ctan(a*x)*x^4-19/35*a*c^3*arctan(a*x)*x^2-16/35/a*c^3*arctan(a*x)*ln(a^2*x^
2+1)+1/105*a^4*c^3*x^5+19/315*a^2*c^3*x^3+38/105*c^3*x-38/105/a*c^3*arctan(
a*x)-8/35*I/a*c^3*ln(I+a*x)*ln(1/2*I*(a*x-I))+8/35*I/a*c^3*ln(I+a*x)*ln(a^2
*x^2+1)-4/35*I/a*c^3*ln(I+a*x)^2-8/35*I/a*c^3*dilog(1/2*I*(a*x-I))+8/35*I/a
*c^3*dilog(-1/2*I*(I+a*x))+4/35*I/a*c^3*ln(a*x-I)^2+8/35*I/a*c^3*ln(a*x-I)*
ln(-1/2*I*(I+a*x))-8/35*I/a*c^3*ln(a*x-I)*ln(a^2*x^2+1)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$420\,a^8c^3\int\frac{x^8\arctan\left(ax\right)^2}{560\left(a^2x^2+1\right)}\,dx+35\,a^8c^3\int\frac{x^8\log\left(a^2x^2+1\right)^2}{560\left(a^2x^2+1\right)}\,dx+20\,a^8c^3\int\frac{x^8\log\left(a^2x^2+1\right)}{560\left(a^2x^2+1\right)}\,dx-40\,a^7c^3\int\frac{x^7\text{ar}}{560}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 420*a^8*c^3*integrate(1/560*x^8*arctan(a*x)^2/(a^2*x^2 + 1), x) + 35*a^8*c^
3*integrate(1/560*x^8*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 20*a^8*c^3*int
egrate(1/560*x^8*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) - 40*a^7*c^3*integrate(
1/560*x^7*arctan(a*x)/(a^2*x^2 + 1), x) + 1680*a^6*c^3*integrate(1/560*x^6*
arctan(a*x)^2/(a^2*x^2 + 1), x) + 140*a^6*c^3*integrate(1/560*x^6*log(a^2*x
^2 + 1)^2/(a^2*x^2 + 1), x) + 84*a^6*c^3*integrate(1/560*x^6*log(a^2*x^2 +
1)/(a^2*x^2 + 1), x) - 168*a^5*c^3*integrate(1/560*x^5*arctan(a*x)/(a^2*x^2
 + 1), x) + 2520*a^4*c^3*integrate(1/560*x^4*arctan(a*x)^2/(a^2*x^2 + 1), x
) + 210*a^4*c^3*integrate(1/560*x^4*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) +
```

```
140*a^4*c^3*integrate(1/560*x^4*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) - 280*a^
3*c^3*integrate(1/560*x^3*arctan(a*x)/(a^2*x^2 + 1), x) + 1680*a^2*c^3*inte
grate(1/560*x^2*arctan(a*x)^2/(a^2*x^2 + 1), x) + 140*a^2*c^3*integrate(1/5
60*x^2*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 140*a^2*c^3*integrate(1/560*x
^2*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) + 1/4*c^3*arctan(a*x)^3/a - 280*a*c^3
*integrate(1/560*x*arctan(a*x)/(a^2*x^2 + 1), x) + 35*c^3*integrate(1/560*l
og(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 1/140*(5*a^6*c^3*x^7 + 21*a^4*c^3*x^5
 + 35*a^2*c^3*x^3 + 35*c^3*x)*arctan(a*x)^2 - 1/560*(5*a^6*c^3*x^7 + 21*a^4
*c^3*x^5 + 35*a^2*c^3*x^3 + 35*c^3*x)*log(a^2*x^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^2*(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int 3 a^{2} x^{2} \operatorname{atan}^{2}{\left(a x \right)}\, dx + \int 3 a^{4} x^{4} \operatorname{atan}^{2}{\left(a x \right)}\, dx + \int a^{6} x^{6} \operatorname{atan}^{2}{\left(a x \right)}\, dx + \int \operatorname{atan}^{2}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**2,x)
```

```
[Out] c**3*(Integral(3*a**2*x**2*atan(a*x)**2, x) + Integral(3*a**4*x**4*atan(a*x
)**2, x) + Integral(a**6*x**6*atan(a*x)**2, x) + Integral(atan(a*x)**2, x))
```

3.278 $\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}{x} dx$

Optimal. Leaf size=287

$$\frac{1}{6}a^6c^3x^6\tan^{-1}(ax)^2-\frac{1}{15}a^5c^3x^5\tan^{-1}(ax)+\frac{1}{60}a^4c^3x^4+\frac{3}{4}a^4c^3x^4\tan^{-1}(ax)^2-\frac{7}{18}a^3c^3x^3\tan^{-1}(ax)+\frac{29}{180}a^2c^3x^2+\frac{34}{45}c^3$$

```
[Out] 29/180*a^2*c^3*x^2+1/60*a^4*c^3*x^4-11/6*a*c^3*x*arctan(a*x)-7/18*a^3*c^3*x
^3*arctan(a*x)-1/15*a^5*c^3*x^5*arctan(a*x)+11/12*c^3*arctan(a*x)^2+3/2*a^2
*c^3*x^2*arctan(a*x)^2+3/4*a^4*c^3*x^4*arctan(a*x)^2+1/6*a^6*c^3*x^6*arctan
(a*x)^2-2*c^3*arctan(a*x)^2*arctanh(-1+2/(1+I*a*x))+34/45*c^3*ln(a^2*x^2+1)
-I*c^3*arctan(a*x)*polylog(2,1-2/(1+I*a*x))+I*c^3*arctan(a*x)*polylog(2,-1+
2/(1+I*a*x))-1/2*c^3*polylog(3,1-2/(1+I*a*x))+1/2*c^3*polylog(3,-1+2/(1+I*a
*x))
```

Rubi [A] time = 0.74, antiderivative size = 287, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4948, 4850, 4988, 4884, 4994, 6610, 4852, 4916, 4846, 260, 266, 43}

$$-\frac{1}{2}c^3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)+\frac{1}{2}c^3\text{PolyLog}\left(3,-1+\frac{2}{1+iax}\right)-ic^3\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+ic^3\tan^{-1}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x,x]
```

```
[Out] (29*a^2*c^3*x^2)/180 + (a^4*c^3*x^4)/60 - (11*a*c^3*x*ArcTan[a*x])/6 - (7*a
^3*c^3*x^3*ArcTan[a*x])/18 - (a^5*c^3*x^5*ArcTan[a*x])/15 + (11*c^3*ArcTan[
a*x]^2)/12 + (3*a^2*c^3*x^2*ArcTan[a*x]^2)/2 + (3*a^4*c^3*x^4*ArcTan[a*x]^2
)/4 + (a^6*c^3*x^6*ArcTan[a*x]^2)/6 + 2*c^3*ArcTan[a*x]^2*ArcTanh[1 - 2/(1
+ I*a*x)] + (34*c^3*Log[1 + a^2*x^2])/45 - I*c^3*ArcTan[a*x]*PolyLog[2, 1 -
 2/(1 + I*a*x)] + I*c^3*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 + I*a*x)] - (c^3*P
olyLog[3, 1 - 2/(1 + I*a*x)])/2 + (c^3*PolyLog[3, -1 + 2/(1 + I*a*x)])/2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^2}{x}\,dx = \int \left(\frac{c^3\tan^{-1}(ax)^2}{x} + 3a^2c^3x\tan^{-1}(ax)^2 + 3a^4c^3x^3\tan^{-1}(ax)^2 + a^6c^3x^5\tan^{-1}(ax)^2\right.$$

$$= c^3\int \frac{\tan^{-1}(ax)^2}{x}\,dx + (3a^2c^3)\int x\tan^{-1}(ax)^2\,dx + (3a^4c^3)\int x^3\tan^{-1}(ax)^2\,dx +$$

$$= \frac{3}{2}a^2c^3x^2\tan^{-1}(ax)^2 + \frac{3}{4}a^4c^3x^4\tan^{-1}(ax)^2 + \frac{1}{6}a^6c^3x^6\tan^{-1}(ax)^2 + 2c^3\tan^{-1}(ax)$$

$$= \frac{3}{2}a^2c^3x^2\tan^{-1}(ax)^2 + \frac{3}{4}a^4c^3x^4\tan^{-1}(ax)^2 + \frac{1}{6}a^6c^3x^6\tan^{-1}(ax)^2 + 2c^3\tan^{-1}(ax)$$

$$= -3ac^3x\tan^{-1}(ax) - \frac{1}{2}a^3c^3x^3\tan^{-1}(ax) - \frac{1}{15}a^5c^3x^5\tan^{-1}(ax) + \frac{3}{2}c^3\tan^{-1}(ax)^2 +$$

$$= -\frac{3}{2}ac^3x\tan^{-1}(ax) - \frac{7}{18}a^3c^3x^3\tan^{-1}(ax) - \frac{1}{15}a^5c^3x^5\tan^{-1}(ax) + \frac{3}{4}c^3\tan^{-1}(ax)^2$$

$$= -\frac{11}{6}ac^3x\tan^{-1}(ax) - \frac{7}{18}a^3c^3x^3\tan^{-1}(ax) - \frac{1}{15}a^5c^3x^5\tan^{-1}(ax) + \frac{11}{12}c^3\tan^{-1}(ax$$

$$= \frac{13}{60}a^2c^3x^2 + \frac{1}{60}a^4c^3x^4 - \frac{11}{6}ac^3x\tan^{-1}(ax) - \frac{7}{18}a^3c^3x^3\tan^{-1}(ax) - \frac{1}{15}a^5c^3x^5\tan$$

$$= \frac{29}{180}a^2c^3x^2 + \frac{1}{60}a^4c^3x^4 - \frac{11}{6}ac^3x\tan^{-1}(ax) - \frac{7}{18}a^3c^3x^3\tan^{-1}(ax) - \frac{1}{15}a^5c^3x^5\tan$$

Mathematica [A] time = 0.57, size = 252, normalized size = 0.88

$$\frac{1}{360}c^3\left(60a^6x^6\tan^{-1}(ax)^2 - 24a^5x^5\tan^{-1}(ax) + 6a^4x^4 + 270a^4x^4\tan^{-1}(ax)^2 - 140a^3x^3\tan^{-1}(ax) + 58a^2x^2 + 272\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x,x]
```

```
[Out] (c^3*(52 - (15*I)*Pi^3 + 58*a^2*x^2 + 6*a^4*x^4 - 660*a*x*ArcTan[a*x] - 140
*a^3*x^3*ArcTan[a*x] - 24*a^5*x^5*ArcTan[a*x] + 330*ArcTan[a*x]^2 + 540*a^2
*x^2*ArcTan[a*x]^2 + 270*a^4*x^4*ArcTan[a*x]^2 + 60*a^6*x^6*ArcTan[a*x]^2 +
 (240*I)*ArcTan[a*x]^3 + 360*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])]
- 360*ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] + 272*Log[1 + a^2*x^2] +
 (360*I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + (360*I)*ArcTan[a*
x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + 180*PolyLog[3, E^((-2*I)*ArcTan[a*x
])] - 180*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/360
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)\arctan(ax)^2}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^2/
x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 11.00, size = 1217, normalized size = 4.24

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^2/x,x)
```

```
[Out] 1/2*I*c^3*Pi*arctan(a*x)^2-2*I*c^3*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^
2+1)^(1/2))-2*I*c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-11/6
*a*c^3*x*arctan(a*x)-7/18*a^3*c^3*x^3*arctan(a*x)-1/15*a^5*c^3*x^5*arctan(a
*x)+3/2*a^2*c^3*x^2*arctan(a*x)^2+3/4*a^4*c^3*x^4*arctan(a*x)^2+1/6*a^6*c^3
*x^6*arctan(a*x)^2+29/180*a^2*c^3*x^2+1/60*a^4*c^3*x^4-1/2*c^3*polylog(3,-(
1+I*a*x)^2/(a^2*x^2+1))+2*c^3*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*c^3
*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-68/45*c^3*ln((1+I*a*x)^2/(a^2*x^2+1
)+1)+11/12*c^3*arctan(a*x)^2+1/2*I*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1
))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/(
(1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2+1/2*I*c^3*Pi*csgn(((1+I*a*x)^2/(a
^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*arctan(a*x)^2-1/2*I*c^3*Pi*csgn
(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+1
/2*I*c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(
a^2*x^2+1)+1))^3+I*c^3*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))-1/2*
I*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1
)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+1/2*I*c^3*Pi*csgn(I*((1+I
*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*
x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2-1/2*I*c^3*arctan(a*x)^
2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn((
(1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-1/2*I*c^3*arctan(
a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+
1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+13/90*c^3+c^3*arctan(a*x)^2*ln(a*x)-c^
3*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+c^3*arctan(a*x)^2*ln(1+(1+I*a
*x)/(a^2*x^2+1)^(1/2))+c^3*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+
68/45*I*c^3*arctan(a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$36\,a^8c^3\int\frac{x^8\arctan(ax)^2}{48\left(a^2x^3+x\right)}\,dx+3\,a^8c^3\int\frac{x^8\log\left(a^2x^2+1\right)^2}{48\left(a^2x^3+x\right)}\,dx+2\,a^8c^3\int\frac{x^8\log\left(a^2x^2+1\right)}{48\left(a^2x^3+x\right)}\,dx-4\,a^7c^3\int\frac{x^7\,\mathrm{arct}}{48\left(a^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x,x, algorithm="maxima")
```

```
[Out] 36*a^8*c^3*integrate(1/48*x^8*arctan(a*x)^2/(a^2*x^3 + x), x) + 3*a^8*c^3*i
ntegrate(1/48*x^8*log(a^2*x^2 + 1)^2/(a^2*x^3 + x), x) + 2*a^8*c^3*integrat
e(1/48*x^8*log(a^2*x^2 + 1)/(a^2*x^3 + x), x) - 4*a^7*c^3*integrate(1/48*x^
7*arctan(a*x)/(a^2*x^3 + x), x) + 144*a^6*c^3*integrate(1/48*x^6*arctan(a*x
)^2/(a^2*x^3 + x), x) + 12*a^6*c^3*integrate(1/48*x^6*log(a^2*x^2 + 1)^2/(a
^2*x^3 + x), x) + 9*a^6*c^3*integrate(1/48*x^6*log(a^2*x^2 + 1)/(a^2*x^3 +
x), x) - 18*a^5*c^3*integrate(1/48*x^5*arctan(a*x)/(a^2*x^3 + x), x) + 216*
a^4*c^3*integrate(1/48*x^4*arctan(a*x)^2/(a^2*x^3 + x), x) + 18*a^4*c^3*int
egrate(1/48*x^4*log(a^2*x^2 + 1)^2/(a^2*x^3 + x), x) + 18*a^4*c^3*integrate
(1/48*x^4*log(a^2*x^2 + 1)/(a^2*x^3 + x), x) - 36*a^3*c^3*integrate(1/48*x^
3*arctan(a*x)/(a^2*x^3 + x), x) + 144*a^2*c^3*integrate(1/48*x^2*arctan(a*x
)^2/(a^2*x^3 + x), x) + 1/24*c^3*log(a^2*x^2 + 1)^3 + 36*c^3*integrate(1/48
```

```
*arctan(a*x)^2/(a^2*x^3 + x), x) + 3*c^3*integrate(1/48*log(a^2*x^2 + 1)^2/
(a^2*x^3 + x), x) + 1/48*(2*a^6*c^3*x^6 + 9*a^4*c^3*x^4 + 18*a^2*c^3*x^2)*a
rctan(a*x)^2 - 1/192*(2*a^6*c^3*x^6 + 9*a^4*c^3*x^4 + 18*a^2*c^3*x^2)*log(a
^2*x^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^2\,\left(c\,a^2\,x^2+c\right)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int \frac{\operatorname{atan}^2(ax)}{x}\,dx + \int 3a^2x\operatorname{atan}^2(ax)\,dx + \int 3a^4x^3\operatorname{atan}^2(ax)\,dx + \int a^6x^5\operatorname{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**2/x,x)
```

```
[Out] c**3*(Integral(atan(a*x)**2/x, x) + Integral(3*a**2*x*atan(a*x)**2, x) + In
tegral(3*a**4*x**3*atan(a*x)**2, x) + Integral(a**6*x**5*atan(a*x)**2, x))
```

3.279 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^2}{x^2} dx$

Optimal. Leaf size=251

$$\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)^2-\frac{1}{10}a^5c^3x^4\tan^{-1}(ax)+\frac{1}{30}a^4c^3x^3+a^4c^3x^3\tan^{-1}(ax)^2-\frac{4}{5}a^3c^3x^2\tan^{-1}(ax)+\frac{7}{10}a^2c^3x+3a^2c^3x$$

```
[Out] 7/10*a^2*c^3*x+1/30*a^4*c^3*x^3-7/10*a*c^3*arctan(a*x)-4/5*a^3*c^3*x^2*arct
an(a*x)-1/10*a^5*c^3*x^4*arctan(a*x)+6/5*I*a*c^3*arctan(a*x)^2-c^3*arctan(a
*x)^2/x+3*a^2*c^3*x*arctan(a*x)^2+a^4*c^3*x^3*arctan(a*x)^2+1/5*a^6*c^3*x^5
*arctan(a*x)^2+22/5*a*c^3*arctan(a*x)*ln(2/(1+I*a*x))+2*a*c^3*arctan(a*x)*l
n(2-2/(1-I*a*x))-I*a*c^3*polylog(2,-1+2/(1-I*a*x))+11/5*I*a*c^3*polylog(2,1
-2/(1+I*a*x))
```

Rubi [A] time = 0.65, antiderivative size = 251, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 14, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636, Rules used = {4948, 4846, 4920, 4854, 2402, 2315, 4852, 4924, 4868, 2447, 4916, 321, 203, 302}

$$-iac^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+\frac{11}{5}iac^3\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{1}{30}a^4c^3x^3+\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)^2-\frac{1}{10}a^5c^3x^4\text{t}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] (7*a^2*c^3*x)/10 + (a^4*c^3*x^3)/30 - (7*a*c^3*ArcTan[a*x])/10 - (4*a^3*c^3
*x^2*ArcTan[a*x])/5 - (a^5*c^3*x^4*ArcTan[a*x])/10 + ((6*I)/5)*a*c^3*ArcTan
[a*x]^2 - (c^3*ArcTan[a*x]^2)/x + 3*a^2*c^3*x*ArcTan[a*x]^2 + a^4*c^3*x^3*A
rcTan[a*x]^2 + (a^6*c^3*x^5*ArcTan[a*x]^2)/5 + (22*a*c^3*ArcTan[a*x]*Log[2/
(1 + I*a*x)])/5 + 2*a*c^3*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)] - I*a*c^3*Poly
Log[2, -1 + 2/(1 - I*a*x)] + ((11*I)/5)*a*c^3*PolyLog[2, 1 - 2/(1 + I*a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3\tan^{-1}(ax)^2}{x^2}\,dx = \int \left(3a^2c^3\tan^{-1}(ax)^2 + \frac{c^3\tan^{-1}(ax)^2}{x^2} + 3a^4c^3x^2\tan^{-1}(ax)^2 + a^6c^3x^4\tan^{-1}(ax\right.$$

$$= c^3\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx + (3a^2c^3)\int \tan^{-1}(ax)^2\,dx + (3a^4c^3)\int x^2\tan^{-1}(ax)^2\,dx$$

$$= -\frac{c^3\tan^{-1}(ax)^2}{x} + 3a^2c^3x\tan^{-1}(ax)^2 + a^4c^3x^3\tan^{-1}(ax)^2 + \frac{1}{5}a^6c^3x^5\tan^{-1}(ax$$

$$= 2iac^3\tan^{-1}(ax)^2 - \frac{c^3\tan^{-1}(ax)^2}{x} + 3a^2c^3x\tan^{-1}(ax)^2 + a^4c^3x^3\tan^{-1}(ax)^2 +$$

$$= -a^3c^3x^2\tan^{-1}(ax) - \frac{1}{10}a^5c^3x^4\tan^{-1}(ax) + iac^3\tan^{-1}(ax)^2 - \frac{c^3\tan^{-1}(ax)^2}{x} +$$

$$= a^2c^3x - \frac{4}{5}a^3c^3x^2\tan^{-1}(ax) - \frac{1}{10}a^5c^3x^4\tan^{-1}(ax) + \frac{6}{5}iac^3\tan^{-1}(ax)^2 - \frac{c^3\tan}{}$$

$$= \frac{7}{10}a^2c^3x + \frac{1}{30}a^4c^3x^3 - ac^3\tan^{-1}(ax) - \frac{4}{5}a^3c^3x^2\tan^{-1}(ax) - \frac{1}{10}a^5c^3x^4\tan^{-1}($$

$$= \frac{7}{10}a^2c^3x + \frac{1}{30}a^4c^3x^3 - \frac{7}{10}ac^3\tan^{-1}(ax) - \frac{4}{5}a^3c^3x^2\tan^{-1}(ax) - \frac{1}{10}a^5c^3x^4\tan$$

$$= \frac{7}{10}a^2c^3x + \frac{1}{30}a^4c^3x^3 - \frac{7}{10}ac^3\tan^{-1}(ax) - \frac{4}{5}a^3c^3x^2\tan^{-1}(ax) - \frac{1}{10}a^5c^3x^4\tan$$

Mathematica [A] time = 0.76, size = 202, normalized size = 0.80

$$c^3\left(6a^6x^6\tan^{-1}(ax)^2 - 3a^5x^5\tan^{-1}(ax) + a^4x^4 + 30a^4x^4\tan^{-1}(ax)^2 - 24a^3x^3\tan^{-1}(ax) + 21a^2x^2 + 90a^2x^2\tan\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] (c^3*(21*a^2*x^2 + a^4*x^4 - 21*a*x*ArcTan[a*x] - 24*a^3*x^3*ArcTan[a*x] -
3*a^5*x^5*ArcTan[a*x] - 30*ArcTan[a*x]^2 - (96*I)*a*x*ArcTan[a*x]^2 + 90*a^
2*x^2*ArcTan[a*x]^2 + 30*a^4*x^4*ArcTan[a*x]^2 + 6*a^6*x^6*ArcTan[a*x]^2 +
60*a*x*ArcTan[a*x]*Log[1 - E^((2*I)*ArcTan[a*x])] + 132*a*x*ArcTan[a*x]*Log
[1 + E^((2*I)*ArcTan[a*x])] - (66*I)*a*x*PolyLog[2, -E^((2*I)*ArcTan[a*x])]
 - (30*I)*a*x*PolyLog[2, E^((2*I)*ArcTan[a*x])]))/(30*x)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)\arctan(ax)^2}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^2,x, algorithm="fricas")

[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^2/x^2, x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^2,x, algorithm="giac")

[Out] Timed out

maple [A] time = 0.11, size = 388, normalized size = 1.55

$$\frac{a^{6}c^{3}x^{5}\arctan\left(ax\right)^{2}}{5}+a^{4}c^{3}x^{3}\arctan\left(ax\right)^{2}+3a^{2}c^{3}x\arctan\left(ax\right)^{2}-\frac{c^{3}\arctan\left(ax\right)^{2}}{x}-\frac{a^{5}c^{3}x^{4}\arctan\left(ax\right)}{10}-\frac{4a^{3}c^{3}x^{2}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a^2*c*x^2+c)^3*arctan(a*x)^2/x^2,x)

[Out] 1/5*a^6*c^3*x^5*arctan(a*x)^2+a^4*c^3*x^3*arctan(a*x)^2+3*a^2*c^3*x*arctan(a*x)^2-c^3*arctan(a*x)^2/x-1/10*a^5*c^3*x^4*arctan(a*x)-4/5*a^3*c^3*x^2*arctan(a*x)+2*a*c^3*arctan(a*x)*ln(a*x)-16/5*a*c^3*arctan(a*x)*ln(a^2*x^2+1)+1/30*a^4*c^3*x^3+7/10*a^2*c^3*x-7/10*a*c^3*arctan(a*x)+I*a*c^3*dilog(1+I*a*x)+8/5*I*a*c^3*dilog(-1/2*I*(I+a*x))-I*a*c^3*dilog(1-I*a*x)+4/5*I*a*c^3*ln(a*x-I)^2-8/5*I*a*c^3*ln(I+a*x)*ln(1/2*I*(a*x-I))-8/5*I*a*c^3*ln(a*x-I)*ln(a^2*x^2+1)+8/5*I*a*c^3*ln(I+a*x)*ln(a^2*x^2+1)-4/5*I*a*c^3*ln(I+a*x)^2+I*a*c^3*ln(a*x)*ln(1+I*a*x)-I*a*c^3*ln(a*x)*ln(1-I*a*x)-8/5*I*a*c^3*dilog(1/2*I*(a*x-I))+8/5*I*a*c^3*ln(a*x-I)*ln(-1/2*I*(I+a*x))

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^2,x, algorithm="maxima")

[Out] Timed out

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x^2,x)

[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x^2, x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int 3a^{2}\operatorname{atan}^{2}{\left(ax\right)}\,dx+\int\frac{\operatorname{atan}^{2}{\left(ax\right)}}{x^{2}}\,dx+\int 3a^{4}x^{2}\operatorname{atan}^{2}{\left(ax\right)}\,dx+\int a^{6}x^{4}\operatorname{atan}^{2}{\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**2/x**2,x)
```

```
[Out] c**3*(Integral(3*a**2*atan(a*x)**2, x) + Integral(atan(a*x)**2/x**2, x) + I
ntegral(3*a**4*x**2*atan(a*x)**2, x) + Integral(a**6*x**4*atan(a*x)**2, x))
```

3.280 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^2}{x^3} \, dx$

Optimal. Leaf size=299

$$\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)^2-\frac{1}{6}a^5c^3x^3\tan^{-1}(ax)+\frac{1}{12}a^4c^3x^2+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)^2-\frac{5}{2}a^3c^3x\tan^{-1}(ax)-\frac{3}{2}a^2c^3\text{Li}_3\left(1-\frac{2}{iax+1}\right.$$

```
[Out] 1/12*a^4*c^3*x^2-a*c^3*arctan(a*x)/x-5/2*a^3*c^3*x*arctan(a*x)-1/6*a^5*c^3*
x^3*arctan(a*x)+3/4*a^2*c^3*arctan(a*x)^2-1/2*c^3*arctan(a*x)^2/x^2+3/2*a^4
*c^3*x^2*arctan(a*x)^2+1/4*a^6*c^3*x^4*arctan(a*x)^2-6*a^2*c^3*arctan(a*x)^
2*arctanh(-1+2/(1+I*a*x))+a^2*c^3*ln(x)+2/3*a^2*c^3*ln(a^2*x^2+1)-3*I*a^2*c
^3*arctan(a*x)*polylog(2,1-2/(1+I*a*x))+3*I*a^2*c^3*arctan(a*x)*polylog(2,-
1+2/(1+I*a*x))-3/2*a^2*c^3*polylog(3,1-2/(1+I*a*x))+3/2*a^2*c^3*polylog(3,-
1+2/(1+I*a*x))
```

Rubi [A] time = 0.60, antiderivative size = 299, normalized size of antiderivative = 1.00, number of steps used = 31, number of rules used = 16, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727, Rules used = {4948, 4852, 4918, 266, 36, 29, 31, 4884, 4850, 4988, 4994, 6610, 4916, 4846, 260, 43}

$$-\frac{3}{2}a^2c^3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)+\frac{3}{2}a^2c^3\text{PolyLog}\left(3,-1+\frac{2}{1+iax}\right)-3ia^2c^3\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+3$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] (a^4*c^3*x^2)/12 - (a*c^3*ArcTan[a*x])/x - (5*a^3*c^3*x*ArcTan[a*x])/2 - (a
^5*c^3*x^3*ArcTan[a*x])/6 + (3*a^2*c^3*ArcTan[a*x]^2)/4 - (c^3*ArcTan[a*x]^
2)/(2*x^2) + (3*a^4*c^3*x^2*ArcTan[a*x]^2)/2 + (a^6*c^3*x^4*ArcTan[a*x]^2)/
4 + 6*a^2*c^3*ArcTan[a*x]^2*ArcTanh[1 - 2/(1 + I*a*x)] + a^2*c^3*Log[x] + (
2*a^2*c^3*Log[1 + a^2*x^2])/3 - (3*I)*a^2*c^3*ArcTan[a*x]*PolyLog[2, 1 - 2/
(1 + I*a*x)] + (3*I)*a^2*c^3*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 + I*a*x)] - (
3*a^2*c^3*PolyLog[3, 1 - 2/(1 + I*a*x)])/2 + (3*a^2*c^3*PolyLog[3, -1 + 2/(
1 + I*a*x)])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}{x^3}\,dx = \int \left(\frac{c^3\tan^{-1}(ax)^2}{x^3} + \frac{3a^2c^3\tan^{-1}(ax)^2}{x} + 3a^4c^3x\tan^{-1}(ax)^2 + a^6c^3x^3\tan^{-1}(ax)^2\right)$$

$$= c^3\int \frac{\tan^{-1}(ax)^2}{x^3}\,dx + \left(3a^2c^3\right)\int \frac{\tan^{-1}(ax)^2}{x}\,dx + \left(3a^4c^3\right)\int x\tan^{-1}(ax)^2\,dx + ($$

$$= -\frac{c^3\tan^{-1}(ax)^2}{2x^2} + \frac{3}{2}a^4c^3x^2\tan^{-1}(ax)^2 + \frac{1}{4}a^6c^3x^4\tan^{-1}(ax)^2 + 6a^2c^3\tan^{-1}(ax)^2\,t$$

$$= -\frac{c^3\tan^{-1}(ax)^2}{2x^2} + \frac{3}{2}a^4c^3x^2\tan^{-1}(ax)^2 + \frac{1}{4}a^6c^3x^4\tan^{-1}(ax)^2 + 6a^2c^3\tan^{-1}(ax)^2\,t$$

$$= -\frac{ac^3\tan^{-1}(ax)}{x} - 3a^3c^3x\tan^{-1}(ax) - \frac{1}{6}a^5c^3x^3\tan^{-1}(ax) + a^2c^3\tan^{-1}(ax)^2 - \frac{c^3\,t}{}$$

$$= -\frac{ac^3\tan^{-1}(ax)}{x} - \frac{5}{2}a^3c^3x\tan^{-1}(ax) - \frac{1}{6}a^5c^3x^3\tan^{-1}(ax) + \frac{3}{4}a^2c^3\tan^{-1}(ax)^2 - \frac{c}{}$$

$$= -\frac{ac^3\tan^{-1}(ax)}{x} - \frac{5}{2}a^3c^3x\tan^{-1}(ax) - \frac{1}{6}a^5c^3x^3\tan^{-1}(ax) + \frac{3}{4}a^2c^3\tan^{-1}(ax)^2 - \frac{c}{}$$

$$= \frac{1}{12}a^4c^3x^2 - \frac{ac^3\tan^{-1}(ax)}{x} - \frac{5}{2}a^3c^3x\tan^{-1}(ax) - \frac{1}{6}a^5c^3x^3\tan^{-1}(ax) + \frac{3}{4}a^2c^3\tan$$

Mathematica [A] time = 0.41, size = 333, normalized size = 1.11

$$\frac{c^3\left(6a^6x^6\tan^{-1}(ax)^2 - 4a^5x^5\tan^{-1}(ax) + 2a^4x^4 + 36a^4x^4\tan^{-1}(ax)^2 - 60a^3x^3\tan^{-1}(ax) + 72ia^2x^2\tan^{-1}(ax)\text{Li}_2\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] (c^3*(2*a^2*x^2 - (3*I)*a^2*Pi^3*x^2 + 2*a^4*x^4 - 24*a*x*ArcTan[a*x] - 60*
a^3*x^3*ArcTan[a*x] - 4*a^5*x^5*ArcTan[a*x] - 12*ArcTan[a*x]^2 + 18*a^2*x^2
```

```
*ArcTan[a*x]^2 + 36*a^4*x^4*ArcTan[a*x]^2 + 6*a^6*x^6*ArcTan[a*x]^2 + (48*I
)*a^2*x^2*ArcTan[a*x]^3 + 72*a^2*x^2*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan
[a*x])] - 72*a^2*x^2*ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] + 24*a^2*
x^2*Log[(a*x)/Sqrt[1 + a^2*x^2]] + 28*a^2*x^2*Log[1 + a^2*x^2] + (72*I)*a^2
*x^2*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + (72*I)*a^2*x^2*ArcTan
[a*x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + 36*a^2*x^2*PolyLog[3, E^((-2*I)*
ArcTan[a*x])] - 36*a^2*x^2*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/(24*x^2)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)\arctan\left(ax\right)^2}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^2/
x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 13.52, size = 1333, normalized size = 4.46

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^2/x^3,x)
```

```
[Out] 4/3*I*a^2*c^3*arctan(a*x)+1/12*a^4*c^3*x^2+3/4*a^2*c^3*arctan(a*x)^2-1/2*c^
3*arctan(a*x)^2/x^2+3*I*a^2*c^3*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2
+1))+3/2*I*a^2*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*
x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*ar
ctan(a*x)^2-3/2*I*a^2*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1
+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2-3/2*I
*a^2*c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(
a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
)^2-6*I*a^2*c^3*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*a^2
*c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/2*I*a^2*c^3*Pi*ar
ctan(a*x)^2-a*c^3*arctan(a*x)/x-3/2*I*a^2*c^3*arctan(a*x)^2*Pi*csgn(I/((1+I
*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^
2*x^2+1)+1))^2+1/12*c^3*a^2-5/2*a^3*c^3*x*arctan(a*x)-1/6*a^5*c^3*x^3*arcta
n(a*x)+3/2*a^4*c^3*x^2*arctan(a*x)^2+1/4*a^6*c^3*x^4*arctan(a*x)^2+3/2*I*a^
2*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1
)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arcta
n(a*x)^2-3/2*I*a^2*c^3*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^
2*x^2+1)+1))^2*arctan(a*x)^2+3/2*I*a^2*c^3*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)
-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*arctan(a*x)^2+3/2*I*a^2*c^3*arctan(a*x)^
2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3+6*a^
2*c^3*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*a^2*c^3*polylog(3,(1+I*a*x)
/(a^2*x^2+1)^(1/2))-7/3*a^2*c^3*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+a^2*c^3*ln(1+
(1+I*a*x)/(a^2*x^2+1)^(1/2))+a^2*c^3*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)-3/2*
a^2*c^3*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))+3*a^2*c^3*arctan(a*x)^2*ln(a*x)
```

```
+3*a^2*c^3*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2*c^3*arctan
(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*a^2*c^3*arctan(a*x)^2*ln((1+I*a
*x)^2/(a^2*x^2+1)-1)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/64*(4*(192*a^8*c^3*integrate(1/16*x^8*arctan(a*x)^2/(a^2*x^5 + x^3), x) +
 16*a^8*c^3*integrate(1/16*x^8*log(a^2*x^2 + 1)^2/(a^2*x^5 + x^3), x) + 16*
a^8*c^3*integrate(1/16*x^8*log(a^2*x^2 + 1)/(a^2*x^5 + x^3), x) - 32*a^7*c^
3*integrate(1/16*x^7*arctan(a*x)/(a^2*x^5 + x^3), x) + 768*a^6*c^3*integrat
e(1/16*x^6*arctan(a*x)^2/(a^2*x^5 + x^3), x) + 64*a^6*c^3*integrate(1/16*x^
6*log(a^2*x^2 + 1)^2/(a^2*x^5 + x^3), x) + 96*a^6*c^3*integrate(1/16*x^6*lo
g(a^2*x^2 + 1)/(a^2*x^5 + x^3), x) - 192*a^5*c^3*integrate(1/16*x^5*arctan(
a*x)/(a^2*x^5 + x^3), x) + 1152*a^4*c^3*integrate(1/16*x^4*arctan(a*x)^2/(a
^2*x^5 + x^3), x) + a^2*c^3*log(a^2*x^2 + 1)^3 + 768*a^2*c^3*integrate(1/16
*x^2*arctan(a*x)^2/(a^2*x^5 + x^3), x) + 64*a^2*c^3*integrate(1/16*x^2*log(
a^2*x^2 + 1)^2/(a^2*x^5 + x^3), x) - 32*a^2*c^3*integrate(1/16*x^2*log(a^2*
x^2 + 1)/(a^2*x^5 + x^3), x) + 64*a*c^3*integrate(1/16*x*arctan(a*x)/(a^2*x
^5 + x^3), x) + 192*c^3*integrate(1/16*arctan(a*x)^2/(a^2*x^5 + x^3), x) +
16*c^3*integrate(1/16*log(a^2*x^2 + 1)^2/(a^2*x^5 + x^3), x))*x^2 + 4*(a^6*
c^3*x^6 + 6*a^4*c^3*x^4 - 2*c^3)*arctan(a*x)^2 - (a^6*c^3*x^6 + 6*a^4*c^3*x
^4 - 2*c^3)*log(a^2*x^2 + 1)^2)/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x^3,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{x^{3}}\, dx + \int \frac{3a^{2}\operatorname{atan}^{2}{\left(ax \right)}}{x}\, dx + \int 3a^{4}x\operatorname{atan}^{2}{\left(ax \right)}\, dx + \int a^{6}x^{3}\operatorname{atan}^{2}{\left(ax \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**2/x**3,x)
```

```
[Out] c**3*(Integral(atan(a*x)**2/x**3, x) + Integral(3*a**2*atan(a*x)**2/x, x) +
 Integral(3*a**4*x*atan(a*x)**2, x) + Integral(a**6*x**3*atan(a*x)**2, x))
```

3.281 $\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}{x^4} dx$

Optimal. Leaf size=250

$$\frac{1}{3}a^6c^3x^3 \tan^{-1}(ax)^2-\frac{1}{3}a^5c^3x^2 \tan^{-1}(ax)+\frac{1}{3}a^4c^3x+3a^4c^3x \tan^{-1}(ax)^2-\frac{8}{3}ia^3c^3\text{Li}_2\left(\frac{2}{1-iax}-1\right)+\frac{8}{3}ia^3c^3\text{Li}_2\left(1-\right.$$

```
[Out] -1/3*a^2*c^3/x+1/3*a^4*c^3*x-2/3*a^3*c^3*arctan(a*x)-1/3*a*c^3*arctan(a*x)/
x^2-1/3*a^5*c^3*x^2*arctan(a*x)-1/3*c^3*arctan(a*x)^2/x^3-3*a^2*c^3*arctan(
a*x)^2/x+3*a^4*c^3*x*arctan(a*x)^2+1/3*a^6*c^3*x^3*arctan(a*x)^2+16/3*a^3*c
^3*arctan(a*x)*ln(2/(1+I*a*x))+16/3*a^3*c^3*arctan(a*x)*ln(2-2/(1-I*a*x))-8
/3*I*a^3*c^3*polylog(2,-1+2/(1-I*a*x))+8/3*I*a^3*c^3*polylog(2,1-2/(1+I*a*x
))
```

Rubi [A] time = 0.61, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 15, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.682, Rules used = {4948, 4846, 4920, 4854, 2402, 2315, 4852, 4918, 325, 203, 4924, 4868, 2447, 4916, 321}

$$-\frac{8}{3}ia^3c^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+\frac{8}{3}ia^3c^3\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{1}{3}a^6c^3x^3 \tan^{-1}(ax)^2-\frac{1}{3}a^5c^3x^2 \tan^{-1}(ax)\cdot$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -(a^2*c^3)/(3*x) + (a^4*c^3*x)/3 - (2*a^3*c^3*ArcTan[a*x])/3 - (a*c^3*ArcTa
n[a*x])/(3*x^2) - (a^5*c^3*x^2*ArcTan[a*x])/3 - (c^3*ArcTan[a*x]^2)/(3*x^3)
 - (3*a^2*c^3*ArcTan[a*x]^2)/x + 3*a^4*c^3*x*ArcTan[a*x]^2 + (a^6*c^3*x^3*A
rcTan[a*x]^2)/3 + (16*a^3*c^3*ArcTan[a*x]*Log[2/(1 + I*a*x)])/3 + (16*a^3*c
^3*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/3 - ((8*I)/3)*a^3*c^3*PolyLog[2, -1
+ 2/(1 - I*a*x)] + ((8*I)/3)*a^3*c^3*PolyLog[2, 1 - 2/(1 + I*a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
```

```
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}{x^4}\,dx = \int \left(3a^4c^3\tan^{-1}(ax)^2+\frac{c^3\tan^{-1}(ax)^2}{x^4}+\frac{3a^2c^3\tan^{-1}(ax)^2}{x^2}+a^6c^3x^2\tan^{-1}(ax)^2\right.$$

$$= c^3\int\frac{\tan^{-1}(ax)^2}{x^4}\,dx+\left(3a^2c^3\right)\int\frac{\tan^{-1}(ax)^2}{x^2}\,dx+\left(3a^4c^3\right)\int\tan^{-1}(ax)^2\,dx+$$

$$= -\frac{c^3\tan^{-1}(ax)^2}{3x^3}-\frac{3a^2c^3\tan^{-1}(ax)^2}{x}+3a^4c^3x\tan^{-1}(ax)^2+\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)$$

$$= -\frac{c^3\tan^{-1}(ax)^2}{3x^3}-\frac{3a^2c^3\tan^{-1}(ax)^2}{x}+3a^4c^3x\tan^{-1}(ax)^2+\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)$$

$$= -\frac{ac^3\tan^{-1}(ax)}{3x^2}-\frac{1}{3}a^5c^3x^2\tan^{-1}(ax)-\frac{c^3\tan^{-1}(ax)^2}{3x^3}-\frac{3a^2c^3\tan^{-1}(ax)^2}{x}+3a$$

$$= -\frac{a^2c^3}{3x}+\frac{1}{3}a^4c^3x-\frac{ac^3\tan^{-1}(ax)}{3x^2}-\frac{1}{3}a^5c^3x^2\tan^{-1}(ax)-\frac{c^3\tan^{-1}(ax)^2}{3x^3}-3a^2c$$

$$= -\frac{a^2c^3}{3x}+\frac{1}{3}a^4c^3x-\frac{2}{3}a^3c^3\tan^{-1}(ax)-\frac{ac^3\tan^{-1}(ax)}{3x^2}-\frac{1}{3}a^5c^3x^2\tan^{-1}(ax)-c^3$$

$$= -\frac{a^2c^3}{3x}+\frac{1}{3}a^4c^3x-\frac{2}{3}a^3c^3\tan^{-1}(ax)-\frac{ac^3\tan^{-1}(ax)}{3x^2}-\frac{1}{3}a^5c^3x^2\tan^{-1}(ax)-c^3$$

Mathematica [A] time = 0.62, size = 221, normalized size = 0.88

$$c^3\left(a^6x^6\tan^{-1}(ax)^2-a^5x^5\tan^{-1}(ax)+a^4x^4+9a^4x^4\tan^{-1}(ax)^2-8ia^3x^3\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)-8ia^3x^3\text{Li}_2\left(e^{2i\tan^{-1}}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] (c^3*(-(a^2*x^2) + a^4*x^4 - a*x*ArcTan[a*x] - 2*a^3*x^3*ArcTan[a*x] - a^5*
x^5*ArcTan[a*x] - ArcTan[a*x]^2 - 9*a^2*x^2*ArcTan[a*x]^2 - (16*I)*a^3*x^3*
ArcTan[a*x]^2 + 9*a^4*x^4*ArcTan[a*x]^2 + a^6*x^6*ArcTan[a*x]^2 + 16*a^3*x^
3*ArcTan[a*x]*Log[1 - E^((2*I)*ArcTan[a*x])] + 16*a^3*x^3*ArcTan[a*x]*Log[1
 + E^((2*I)*ArcTan[a*x])] - (8*I)*a^3*x^3*PolyLog[2, -E^((2*I)*ArcTan[a*x])
] - (8*I)*a^3*x^3*PolyLog[2, E^((2*I)*ArcTan[a*x])]))/(3*x^3)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^{6}c^{3}x^{6}+3\,a^{4}c^{3}x^{4}+3\,a^{2}c^{3}x^{2}+c^{3}\right)\arctan\left(ax\right)^{2}}{x^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^2/
x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.12, size = 417, normalized size = 1.67

$$\frac{a^{6}c^{3}x^{3}\arctan\left(ax\right)^{2}}{3}+3a^{4}c^{3}x\arctan\left(ax\right)^{2}-\frac{c^{3}\arctan\left(ax\right)^{2}}{3x^{3}}-\frac{3a^{2}c^{3}\arctan\left(ax\right)^{2}}{x}-\frac{a^{5}c^{3}x^{2}\arctan\left(ax\right)}{3}-\frac{a\,c^{3}\arctan\left(\right.}{3x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^2/x^4,x)
```

```
[Out] 1/3*a^6*c^3*x^3*arctan(a*x)^2+3*a^4*c^3*x*arctan(a*x)^2-1/3*c^3*arctan(a*x)
^2/x^3-3*a^2*c^3*arctan(a*x)^2/x-1/3*a^5*c^3*x^2*arctan(a*x)-1/3*a*c^3*arct
an(a*x)/x^2+16/3*a^3*c^3*arctan(a*x)*ln(a*x)-16/3*a^3*c^3*arctan(a*x)*ln(a^
2*x^2+1)+1/3*a^4*c^3*x-1/3*a^2*c^3/x-2/3*a^3*c^3*arctan(a*x)+8/3*I*a^3*c^3*
dilog(-1/2*I*(I+a*x))+8/3*I*a^3*c^3*ln(a*x)*ln(1+I*a*x)-8/3*I*a^3*c^3*dilog
(1/2*I*(a*x-I))-8/3*I*a^3*c^3*ln(a*x-I)*ln(a^2*x^2+1)-8/3*I*a^3*c^3*ln(I+a*
x)*ln(1/2*I*(a*x-I))-4/3*I*a^3*c^3*ln(I+a*x)^2+8/3*I*a^3*c^3*ln(a*x-I)*ln(-
1/2*I*(I+a*x))+4/3*I*a^3*c^3*ln(a*x-I)^2-8/3*I*a^3*c^3*dilog(1-I*a*x)+8/3*I
*a^3*c^3*dilog(1+I*a*x)+8/3*I*a^3*c^3*ln(I+a*x)*ln(a^2*x^2+1)-8/3*I*a^3*c^3
*ln(a*x)*ln(1-I*a*x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^2/x^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x^4,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^3)/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int 3a^{4}\operatorname{atan}^{2}{\left(ax\right)}\,dx+\int\frac{\operatorname{atan}^{2}{\left(ax\right)}}{x^{4}}\,dx+\int\frac{3a^{2}\operatorname{atan}^{2}{\left(ax\right)}}{x^{2}}\,dx+\int a^{6}x^{2}\operatorname{atan}^{2}{\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**2/x**4,x)
```

```
[Out] c**3*(Integral(3*a**4*atan(a*x)**2, x) + Integral(atan(a*x)**2/x**4, x) + I
ntegral(3*a**2*atan(a*x)**2/x**2, x) + Integral(a**6*x**2*atan(a*x)**2, x))
```

3.282 $\int \frac{x^4 \tan^{-1}(ax)^2}{c+a^2cx^2} \, dx$

Optimal. Leaf size=166

$$-\frac{4i\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{3a^5c}+\frac{\tan^{-1}(ax)^3}{3a^5c}-\frac{4i\tan^{-1}(ax)^2}{3a^5c}-\frac{\tan^{-1}(ax)}{3a^5c}-\frac{8\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{3a^5c}+\frac{x}{3a^4c}-\frac{x\tan^{-1}(ax)^2}{a^4c}-\frac{x^2\tan^{-}}{3a^3}$$

```
[Out] 1/3*x/a^4/c-1/3*arctan(a*x)/a^5/c-1/3*x^2*arctan(a*x)/a^3/c-4/3*I*arctan(a*
x)^2/a^5/c-x*arctan(a*x)^2/a^4/c+1/3*x^3*arctan(a*x)^2/a^2/c+1/3*arctan(a*x
)^3/a^5/c-8/3*arctan(a*x)*ln(2/(1+I*a*x))/a^5/c-4/3*I*polylog(2,1-2/(1+I*a*
x))/a^5/c
```

Rubi [A] time = 0.39, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4916, 4852, 321, 203, 4920, 4854, 2402, 2315, 4846, 4884}

$$-\frac{4i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{3a^5c}+\frac{x^3\tan^{-1}(ax)^2}{3a^2c}-\frac{x^2\tan^{-1}(ax)}{3a^3c}+\frac{x}{3a^4c}-\frac{x\tan^{-1}(ax)^2}{a^4c}+\frac{\tan^{-1}(ax)^3}{3a^5c}-\frac{4i\tan^{-1}(ax)^2}{3a^5c}-\frac{\tan^{-1}}{3a^5}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] x/(3*a^4*c) - ArcTan[a*x]/(3*a^5*c) - (x^2*ArcTan[a*x])/(3*a^3*c) - (((4*I)
/3)*ArcTan[a*x]^2)/(a^5*c) - (x*ArcTan[a*x]^2)/(a^4*c) + (x^3*ArcTan[a*x]^2
)/(3*a^2*c) + ArcTan[a*x]^3/(3*a^5*c) - (8*ArcTan[a*x]*Log[2/(1 + I*a*x)])/
(3*a^5*c) - (((4*I)/3)*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^5*c)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^2}{c+a^2cx^2} dx = -\frac{\int \frac{x^2 \tan^{-1}(ax)^2}{c+a^2cx^2} dx}{a^2} + \frac{\int x^2 \tan^{-1}(ax)^2 dx}{a^2c}$$
$$= \frac{x^3 \tan^{-1}(ax)^2}{3a^2c} + \frac{\int \frac{\tan^{-1}(ax)^2}{c+a^2cx^2} dx}{a^4} - \frac{\int \tan^{-1}(ax)^2 dx}{a^4c} - \frac{2\int \frac{x^3 \tan^{-1}(ax)}{1+a^2x^2} dx}{3ac}$$
$$= -\frac{x \tan^{-1}(ax)^2}{a^4c} + \frac{x^3 \tan^{-1}(ax)^2}{3a^2c} + \frac{\tan^{-1}(ax)^3}{3a^5c} - \frac{2\int x \tan^{-1}(ax) dx}{3a^3c} + \frac{2\int \frac{x \tan^{-1}(ax)}{1+a^2x^2} dx}{3a^3c} + \frac{2}{\ldots}$$
$$= -\frac{x^2 \tan^{-1}(ax)}{3a^3c} - \frac{4i \tan^{-1}(ax)^2}{3a^5c} - \frac{x \tan^{-1}(ax)^2}{a^4c} + \frac{x^3 \tan^{-1}(ax)^2}{3a^2c} + \frac{\tan^{-1}(ax)^3}{3a^5c} - \frac{2\int \frac{\tan^{-1}(a\ldots}{i-ax}}{3a^4c}$$
$$= \frac{x}{3a^4c} - \frac{x^2 \tan^{-1}(ax)}{3a^3c} - \frac{4i \tan^{-1}(ax)^2}{3a^5c} - \frac{x \tan^{-1}(ax)^2}{a^4c} + \frac{x^3 \tan^{-1}(ax)^2}{3a^2c} + \frac{\tan^{-1}(ax)^3}{3a^5c} - \frac{8 \tan\ldots}{\ldots}$$
$$= \frac{x}{3a^4c} - \frac{\tan^{-1}(ax)}{3a^5c} - \frac{x^2 \tan^{-1}(ax)}{3a^3c} - \frac{4i \tan^{-1}(ax)^2}{3a^5c} - \frac{x \tan^{-1}(ax)^2}{a^4c} + \frac{x^3 \tan^{-1}(ax)^2}{3a^2c} + \frac{\tan^{-1}\ldots}{3a\ldots}$$
$$= \frac{x}{3a^4c} - \frac{\tan^{-1}(ax)}{3a^5c} - \frac{x^2 \tan^{-1}(ax)}{3a^3c} - \frac{4i \tan^{-1}(ax)^2}{3a^5c} - \frac{x \tan^{-1}(ax)^2}{a^4c} + \frac{x^3 \tan^{-1}(ax)^2}{3a^2c} + \frac{\tan^{-1}\ldots}{3a\ldots}$$

Mathematica [**A**] time = 0.31, size = 90, normalized size = 0.54

$$\frac{\left(a^3x^3 - 3ax + 4i\right) \tan^{-1}(ax)^2 - \tan^{-1}(ax)\left(a^2x^2 + 8\log\left(1 + e^{2i\tan^{-1}(ax)}\right) + 1\right) + 4i\mathrm{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) + ax + \tan^{-1}(\ldots}{3a^5c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] (a*x + (4*I - 3*a*x + a^3*x^3)*ArcTan[a*x]^2 + ArcTan[a*x]^3 - ArcTan[a*x]*
(1 + a^2*x^2 + 8*Log[1 + E^((2*I)*ArcTan[a*x])]) + (4*I)*PolyLog[2, -E^((2*
I)*ArcTan[a*x])])/(3*a^5*c)
```

fricas [**F**] time = 3.17, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^4 \arctan(ax)^2}{a^2cx^2 + c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x^4*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

giac [**F**] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [**A**] time = 0.10, size = 284, normalized size = 1.71

$$\frac{x^3 \arctan(ax)^2}{3a^2c} - \frac{x \arctan(ax)^2}{a^4c} + \frac{\arctan(ax)^3}{3a^5c} - \frac{x^2 \arctan(ax)}{3a^3c} + \frac{4\arctan(ax)\ln\left(a^2x^2+1\right)}{3a^5c} + \frac{x}{3a^4c} - \frac{\arctan(ax)}{3a^5c} + \ldots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^2/(a^2*c*x^2+c),x)
```

```
[Out] 1/3*x^3*arctan(a*x)^2/a^2/c-x*arctan(a*x)^2/a^4/c+1/3*arctan(a*x)^3/a^5/c-1
/3*x^2*arctan(a*x)/a^3/c+4/3/a^5/c*arctan(a*x)*ln(a^2*x^2+1)+1/3*x/a^4/c-1/
3*arctan(a*x)/a^5/c+2/3*I/a^5/c*ln(I+a*x)*ln(1/2*I*(a*x-I))+2/3*I/a^5/c*ln(
a*x-I)*ln(a^2*x^2+1)-1/3*I/a^5/c*ln(a*x-I)^2-2/3*I/a^5/c*ln(I+a*x)*ln(a^2*x
^2+1)-2/3*I/a^5/c*ln(a*x-I)*ln(-1/2*I*(I+a*x))-2/3*I/a^5/c*dilog(-1/2*I*(I+
a*x))+2/3*I/a^5/c*dilog(1/2*I*(a*x-I))+1/3*I/a^5/c*ln(I+a*x)^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4 \operatorname{atan}(a\,x)^2}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^2)/(c + a^2*c*x^2),x)
```

```
[Out] int((x^4*atan(a*x)^2)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4 \operatorname{atan}^2(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**4*atan(a*x)**2/(a**2*x**2 + 1), x)/c
```

3.283 $\int \frac{x^3 \tan^{-1}(ax)^2}{c+a^2cx^2} \, dx$

Optimal. Leaf size=169

$$\frac{\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{2a^4c}+\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{a^4c}+\frac{i\tan^{-1}(ax)^3}{3a^4c}+\frac{\tan^{-1}(ax)^2}{2a^4c}+\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^2}{a^4c}-\frac{x\tan^{-1}(ax)}{a^3c}+\frac{x^2\,\text{t}}{}$$

```
[Out] -x*arctan(a*x)/a^3/c+1/2*arctan(a*x)^2/a^4/c+1/2*x^2*arctan(a*x)^2/a^2/c+1/
3*I*arctan(a*x)^3/a^4/c+arctan(a*x)^2*ln(2/(1+I*a*x))/a^4/c+1/2*ln(a^2*x^2+
1)/a^4/c+I*arctan(a*x)*polylog(2,1-2/(1+I*a*x))/a^4/c+1/2*polylog(3,1-2/(1+
I*a*x))/a^4/c
```

Rubi [A] time = 0.29, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4916, 4852, 4846, 260, 4884, 4920, 4854, 4994, 6610}

$$\frac{\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^4c}+\frac{i\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^4c}+\frac{\log\left(a^2x^2+1\right)}{2a^4c}+\frac{x^2\tan^{-1}(ax)^2}{2a^2c}+\frac{i\tan^{-1}(ax)^3}{3a^4c}+\frac{\tan^{-1}(}{2a^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] -((x*ArcTan[a*x])/(a^3*c)) + ArcTan[a*x]^2/(2*a^4*c) + (x^2*ArcTan[a*x]^2)/
(2*a^2*c) + ((I/3)*ArcTan[a*x]^3)/(a^4*c) + (ArcTan[a*x]^2*Log[2/(1 + I*a*x
)])/(a^4*c) + Log[1 + a^2*x^2]/(2*a^4*c) + (I*ArcTan[a*x]*PolyLog[2, 1 - 2/
(1 + I*a*x)])/(a^4*c) + PolyLog[3, 1 - 2/(1 + I*a*x)]/(2*a^4*c)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)^2}{c+a^2cx^2}\,dx = -\frac{\int \frac{x\tan^{-1}(ax)^2}{c+a^2cx^2}\,dx}{a^2}+\frac{\int x\tan^{-1}(ax)^2\,dx}{a^2c}$$

$$=\frac{x^2\tan^{-1}(ax)^2}{2a^2c}+\frac{i\tan^{-1}(ax)^3}{3a^4c}+\frac{\int \frac{\tan^{-1}(ax)^2}{i-ax}\,dx}{a^3c}-\frac{\int \frac{x^2\tan^{-1}(ax)}{1+a^2x^2}\,dx}{ac}$$

$$=\frac{x^2\tan^{-1}(ax)^2}{2a^2c}+\frac{i\tan^{-1}(ax)^3}{3a^4c}+\frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^4c}-\frac{\int\tan^{-1}(ax)\,dx}{a^3c}+\frac{\int \frac{\tan^{-1}(ax)}{1+a^2x^2}\,d}{a^3c}$$

$$=-\frac{x\tan^{-1}(ax)}{a^3c}+\frac{\tan^{-1}(ax)^2}{2a^4c}+\frac{x^2\tan^{-1}(ax)^2}{2a^2c}+\frac{i\tan^{-1}(ax)^3}{3a^4c}+\frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^4c}+$$

$$=-\frac{x\tan^{-1}(ax)}{a^3c}+\frac{\tan^{-1}(ax)^2}{2a^4c}+\frac{x^2\tan^{-1}(ax)^2}{2a^2c}+\frac{i\tan^{-1}(ax)^3}{3a^4c}+\frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^4c}+$$

Mathematica [A] time = 0.12, size = 123, normalized size = 0.73

$$\frac{-\log\left(\frac{1}{\sqrt{a^2x^2+1}}\right)+\frac{1}{2}\left(a^2x^2+1\right)\tan^{-1}(ax)^2-i\tan^{-1}(ax)\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)+\frac{1}{2}\text{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right)-\frac{1}{3}i\tan^{-1}(ax)^3}{a^4c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] (-(a*x*ArcTan[a*x]) + ((1 + a^2*x^2)*ArcTan[a*x]^2)/2 - (I/3)*ArcTan[a*x]^3
 + ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] - Log[1/Sqrt[1 + a^2*x^2]]
- I*ArcTan[a*x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + PolyLog[3, -E^((2*I)*A
rcTan[a*x])]/2)/(a^4*c)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^3 \arctan{(ax)}^2}{a^2cx^2 + c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x^3*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.52, size = 1695, normalized size = 10.03

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^2/(a^2*c*x^2+c),x)
```

```
[Out] 1/8/a^3/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*x^
2+1)+1))^2*arctan(a*x)^2*Pi*x+1/4/a^3/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*
I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*arctan(a*x
)^2*Pi*x-1/8/a^3/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^
2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*arctan(a*x)^2*Pi*x+1/2*I/a^4/c*
csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*arcta
n(a*x)^2*Pi-1/2/a^4/c*arctan(a*x)^2*ln(a^2*x^2+1)+1/a^4/c*arctan(a*x)^2*ln(
(1+I*a*x)/(a^2*x^2+1)^(1/2))+I/a^4/c*arctan(a*x)-1/3*I/a^4/c*arctan(a*x)^3+
1/2*arctan(a*x)^2/a^4/c-1/4/a^3/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*c
sgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2*Pi*x-x*arctan(a*x)/a^3/c+1
/2*x^2*arctan(a*x)^2/a^2/c-1/8/a^3/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(
1+I*a*x)^2/(a^2*x^2+1)+I)^3*arctan(a*x)^2*Pi*x+1/8/a^3/c*csgn(I*((1+I*a*x)^
2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2*Pi*x+1/8*I/a^4/c*csgn(I*(1+I*a*x)^4/(a^
2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^3*arctan(a*x)^2*Pi+1/8*I/a^4/c*cs
gn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2*Pi-1/4*I/a^4/c*csgn(I*(
1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2*Pi-1/
4*I/a^4/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*arctan(a*x)^2*Pi+1/2/a^4/c*poly
log(3,-(1+I*a*x)^2/(a^2*x^2+1))+1/4*I/a^4/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))
*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x
)^2*Pi-1/4*I/a^4/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^
2+1)^(1/2))^2*arctan(a*x)^2*Pi+1/4*I/a^4/c*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+
1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arcta
n(a*x)^2*Pi-1/4*I/a^4/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a
^2*x^2+1)+I)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*arctan(a*x)^2*Pi+1/8*I/a^4
/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(
1+I*a*x)^2/(a^2*x^2+1)+I)^2*arctan(a*x)^2*Pi-1/4*I/a^4/c*csgn(I*((1+I*a*x)^
2/(a^2*x^2+1)+1)^2)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2*Pi+
1/8*I/a^4/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*
```

```
x^2+1)+1))^2*arctan(a*x)^2*Pi-1/a^4/c*ln((1+I*a*x)^2/(a^2*x^2+1)+1)-I/a^4/c
*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+1/a^4/c*ln(2)*arctan(a*x)^
2-1/4*I/a^4/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+
1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arct
an(a*x)^2*Pi
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan(ax)^2}{a^2cx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3 \operatorname{atan}(a\,x)^2}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2),x)
```

```
[Out] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \operatorname{atan}^2(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**3*atan(a*x)**2/(a**2*x**2 + 1), x)/c
```

3.284 $\int \frac{x^2 \tan^{-1}(ax)^2}{c+a^2cx^2}\,dx$

Optimal. Leaf size=98

$$\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{a^3c}-\frac{\tan^{-1}(ax)^3}{3a^3c}+\frac{i\tan^{-1}(ax)^2}{a^3c}+\frac{2\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^3c}+\frac{x\tan^{-1}(ax)^2}{a^2c}$$

```
[Out] I*arctan(a*x)^2/a^3/c+x*arctan(a*x)^2/a^2/c-1/3*arctan(a*x)^3/a^3/c+2*arcta
n(a*x)*ln(2/(1+I*a*x))/a^3/c+I*polylog(2,1-2/(1+I*a*x))/a^3/c
```

Rubi [A] time = 0.17, antiderivative size = 98, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4916, 4846, 4920, 4854, 2402, 2315, 4884}

$$\frac{i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^3c}-\frac{\tan^{-1}(ax)^3}{3a^3c}+\frac{x\tan^{-1}(ax)^2}{a^2c}+\frac{i\tan^{-1}(ax)^2}{a^3c}+\frac{2\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{a^3c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] (I*ArcTan[a*x]^2)/(a^3*c) + (x*ArcTan[a*x]^2)/(a^2*c) - ArcTan[a*x]^3/(3*a^
3*c) + (2*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(a^3*c) + (I*PolyLog[2, 1 - 2/(1
+ I*a*x)])/(a^3*c)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
```

```
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^2}{c+a^2cx^2}\,dx = -\frac{\int \frac{\tan^{-1}(ax)^2}{c+a^2cx^2}\,dx}{a^2} + \frac{\int \tan^{-1}(ax)^2\,dx}{a^2c}$$
$$= \frac{x\tan^{-1}(ax)^2}{a^2c} - \frac{\tan^{-1}(ax)^3}{3a^3c} - \frac{2\int \frac{x\tan^{-1}(ax)}{1+a^2x^2}\,dx}{ac}$$
$$= \frac{i\tan^{-1}(ax)^2}{a^3c} + \frac{x\tan^{-1}(ax)^2}{a^2c} - \frac{\tan^{-1}(ax)^3}{3a^3c} + \frac{2\int \frac{\tan^{-1}(ax)}{i-ax}\,dx}{a^2c}$$
$$= \frac{i\tan^{-1}(ax)^2}{a^3c} + \frac{x\tan^{-1}(ax)^2}{a^2c} - \frac{\tan^{-1}(ax)^3}{3a^3c} + \frac{2\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^3c} - \frac{2\int \frac{\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx}{a^2c}$$
$$= \frac{i\tan^{-1}(ax)^2}{a^3c} + \frac{x\tan^{-1}(ax)^2}{a^2c} - \frac{\tan^{-1}(ax)^3}{3a^3c} + \frac{2\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^3c} + \frac{(2i)\,\mathrm{Subst}\left(\int \frac{\log}{1\cdots}\right.}{a^3}$$
$$= \frac{i\tan^{-1}(ax)^2}{a^3c} + \frac{x\tan^{-1}(ax)^2}{a^2c} - \frac{\tan^{-1}(ax)^3}{3a^3c} + \frac{2\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{a^3c} + \frac{i\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{a^3c}$$

Mathematica [A] time = 0.18, size = 69, normalized size = 0.70

$$\frac{-i\mathrm{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) - \frac{1}{3}\tan^{-1}(ax)\left(\tan^{-1}(ax)^2 + (-3ax+3i)\tan^{-1}(ax) - 6\log\left(1+e^{2i\tan^{-1}(ax)}\right)\right)}{a^3c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] (-1/3*(ArcTan[a*x]*((3*I - 3*a*x)*ArcTan[a*x] + ArcTan[a*x]^2 - 6*Log[1 + E
^((2*I)*ArcTan[a*x])])) - I*PolyLog[2, -E^((2*I)*ArcTan[a*x])])/(a^3*c)
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^2\arctan(ax)^2}{a^2cx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x^2*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.09, size = 230, normalized size = 2.35

$$\frac{x\arctan(ax)^2}{a^2c}-\frac{\arctan(ax)^3}{3a^3c}-\frac{\arctan(ax)\ln\left(a^2x^2+1\right)}{a^3c}-\frac{i\ln(ax-i)\ln\left(a^2x^2+1\right)}{2a^3c}+\frac{i\ln(ax-i)^2}{4a^3c}+\frac{i\,\mathrm{dilog}\left(-\frac{i(ax+i)}{2}\right.}{2a^3c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^2/(a^2*c*x^2+c),x)
```

```
[Out] x*arctan(a*x)^2/a^2/c-1/3*arctan(a*x)^3/a^3/c-1/a^3/c*arctan(a*x)*ln(a^2*x^
2+1)-1/2*I/a^3/c*ln(a*x-I)*ln(a^2*x^2+1)+1/4*I/a^3/c*ln(a*x-I)^2+1/2*I/a^3/
c*dilog(-1/2*I*(I+a*x))+1/2*I/a^3/c*ln(a*x-I)*ln(-1/2*I*(I+a*x))+1/2*I/a^3/
c*ln(I+a*x)*ln(a^2*x^2+1)-1/4*I/a^3/c*ln(I+a*x)^2-1/2*I/a^3/c*dilog(1/2*I*(
a*x-I))-1/2*I/a^3/c*ln(I+a*x)*ln(1/2*I*(a*x-I))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^2}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2),x)
```

```
[Out] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2\,\mathrm{atan}^2\,(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**2*atan(a*x)**2/(a**2*x**2 + 1), x)/c
```

3.285 $\int \frac{x \tan^{-1}(ax)^2}{c+a^2cx^2} dx$

Optimal. Leaf size=102

$$-\frac{\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{2a^2c}-\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{a^2c}-\frac{i\tan^{-1}(ax)^3}{3a^2c}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^2}{a^2c}$$

```
[Out] -1/3*I*arctan(a*x)^3/a^2/c-arctan(a*x)^2*ln(2/(1+I*a*x))/a^2/c-I*arctan(a*x
)*polylog(2,1-2/(1+I*a*x))/a^2/c-1/2*polylog(3,1-2/(1+I*a*x))/a^2/c
```

Rubi [A] time = 0.15, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4920, 4854, 4884, 4994, 6610}

$$-\frac{\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^2c}-\frac{i\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^2c}-\frac{i\tan^{-1}(ax)^3}{3a^2c}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^2}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] ((-I/3)*ArcTan[a*x]^3)/(a^2*c) - (ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/(a^2*c)
 - (I*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^2*c) - PolyLog[3, 1 - 2
/(1 + I*a*x)]/(2*a^2*c)
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^2}{c+a^2cx^2}\,dx = -\frac{i\tan^{-1}(ax)^3}{3a^2c} - \frac{\int \frac{\tan^{-1}(ax)^2}{i-ax}\,dx}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^3}{3a^2c} - \frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^2c} + \frac{2\int \frac{\tan^{-1}(ax)\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^3}{3a^2c} - \frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^2c} - \frac{i\tan^{-1}(ax)\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{a^2c} + \frac{i\int \frac{\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^3}{3a^2c} - \frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^2c} - \frac{i\tan^{-1}(ax)\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{a^2c} - \frac{\mathrm{Li}_3\left(1-\frac{2}{1+iax}\right)}{2a^2c}$$

Mathematica [A] time = 0.01, size = 110, normalized size = 1.08

$$-\frac{\mathrm{Li}_3\left(\frac{ax+i}{ax-i}\right)}{2a^2c} - \frac{i\mathrm{Li}_2\left(\frac{ax+i}{ax-i}\right)\tan^{-1}(ax)}{a^2c} - \frac{i\tan^{-1}(ax)^3}{3a^2c} - \frac{\log\left(\frac{2i}{-ax+i}\right)\tan^{-1}(ax)^2}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
```

```
[Out] ((-1/3*I)*ArcTan[a*x]^3)/(a^2*c) - (ArcTan[a*x]^2*Log[(2*I)/(I - a*x)])/(a^
2*c) - (I*ArcTan[a*x]*PolyLog[2, (I + a*x)/(-I + a*x)])/(a^2*c) - PolyLog[3
, (I + a*x)/(-I + a*x)]/(2*a^2*c)
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x\arctan(ax)^2}{a^2cx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.58, size = 897, normalized size = 8.79

$$\frac{\arctan(ax)^2\ln\left(a^2x^2+1\right)}{2a^2c} - \frac{\arctan(ax)^2\ln\left(\frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{a^2c} + \frac{i\,\mathrm{csgn}\left(\frac{i(iax+1)^2}{\left(a^2x^2+1\right)\left(\frac{(iax+1)^2}{a^2x^2+1}+1\right)^2}\right)^3\arctan(ax)^2\pi}{4a^2c} - \frac{i\,\mathrm{csgn}\left(\frac{i(iax+1)}{a^2x^2+1}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^2/(a^2*c*x^2+c),x)
```

```
[Out] 1/2/a^2/c*arctan(a*x)^2*ln(a^2*x^2+1)-1/a^2/c*arctan(a*x)^2*ln((1+I*a*x)/(a
^2*x^2+1)^(1/2))+1/4*I/a^2/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a
^2*x^2+1)+1)^2)^3*arctan(a*x)^2*Pi-1/2*I/a^2/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+
1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*Pi-1/4*I/a^2/c*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arc
tan(a*x)^2*Pi-1/4*I/a^2/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^
2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2*Pi+1/4*I/a^2/c
*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*arct
an(a*x)^2*Pi-1/4*I/a^2/c*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*
a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2*Pi+1/4*I/
a^2/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*arctan(a*x)^2*Pi+I/a^2/c*arctan(a*x
)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))-1/4*I/a^2/c*csgn(I*((1+I*a*x)^2/(a^2*
x^2+1)+1)^2)^3*arctan(a*x)^2*Pi+1/3*I/a^2/c*arctan(a*x)^3-1/a^2/c*ln(2)*arc
tan(a*x)^2+1/4*I/a^2/c*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*
x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1
)^2)*arctan(a*x)^2*Pi-1/2/a^2/c*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))+1/2*I/a
^2/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)^2*arctan(a*x)^2*Pi
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \arctan(ax)^2}{a^2cx^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x \operatorname{atan}(a\,x)^2}{c\,a^2\,x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^2)/(c + a^2*c*x^2),x)
```

```
[Out] int((x*atan(a*x)^2)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^2(ax)}{a^2x^2+1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x*atan(a*x)**2/(a**2*x**2 + 1), x)/c
```

3.286 $\int \frac{\tan^{-1}(ax)^2}{c+a^2cx^2} \, dx$

Optimal. Leaf size=16

$$\frac{\tan^{-1}(ax)^3}{3ac}$$

```
[Out] 1/3*arctan(a*x)^3/a/c
```

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4884}

$$\frac{\tan^{-1}(ax)^3}{3ac}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(c + a^2*c*x^2),x]
```

```
[Out] ArcTan[a*x]^3/(3*a*c)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{c + a^2cx^2} \, dx = \frac{\tan^{-1}(ax)^3}{3ac}$$

Mathematica [A] time = 0.00, size = 16, normalized size = 1.00

$$\frac{\tan^{-1}(ax)^3}{3ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^2/(c + a^2*c*x^2),x]
```

```
[Out] ArcTan[a*x]^3/(3*a*c)
```

fricas [A] time = 0.67, size = 14, normalized size = 0.88

$$\frac{\arctan(ax)^3}{3\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/3*arctan(a*x)^3/(a*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.03, size = 15, normalized size = 0.94

$$\frac{\arctan(ax)^3}{3ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/(a^2*c*x^2+c),x)
```

```
[Out] 1/3*arctan(a*x)^3/a/c
```

maxima [A] time = 0.41, size = 14, normalized size = 0.88

$$\frac{\arctan(ax)^3}{3\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] 1/3*arctan(a*x)^3/(a*c)
```

mupad [B] time = 0.16, size = 14, normalized size = 0.88

$$\frac{\mathrm{atan}(a\,x)^3}{3\,a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(c + a^2*c*x^2),x)
```

```
[Out] atan(a*x)^3/(3*a*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\mathrm{atan}^2(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**2/(a**2*x**2 + 1), x)/c
```

3.287 $\int \frac{\tan^{-1}(ax)^2}{x(c+a^2cx^2)}\,dx$

Optimal. Leaf size=91

$$\frac{\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c}-\frac{i\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c}-\frac{i\tan^{-1}(ax)^3}{3c}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)^2}{c}$$

```
[Out] -1/3*I*arctan(a*x)^3/c+arctan(a*x)^2*ln(2-2/(1-I*a*x))/c-I*arctan(a*x)*poly
log(2,-1+2/(1-I*a*x))/c+1/2*polylog(3,-1+2/(1-I*a*x))/c
```

Rubi [A] time = 0.18, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4924, 4868, 4884, 4992, 6610}

$$\frac{\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c}-\frac{i\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c}-\frac{i\tan^{-1}(ax)^3}{3c}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)^2}{c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)),x]
```

```
[Out] ((-I/3)*ArcTan[a*x]^3)/c + (ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c - (I*Ar
cTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)])/c + PolyLog[3, -1 + 2/(1 - I*a*x)
]/(2*c)
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)}\,dx = -\frac{i\tan^{-1}(ax)^3}{3c} + \frac{i\int \frac{\tan^{-1}(ax)^2}{x(i+ax)}\,dx}{c}$$

$$= -\frac{i\tan^{-1}(ax)^3}{3c} + \frac{\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{c} - \frac{(2a)\int \frac{\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{1+a^2x^2}\,dx}{c}$$

$$= -\frac{i\tan^{-1}(ax)^3}{3c} + \frac{\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{c} - \frac{i\tan^{-1}(ax)\text{Li}_2\left(-1+\frac{2}{1-iax}\right)}{c} + \frac{(ia)\int \frac{\text{Li}_2(-1}{1+}}{c}$$

$$= -\frac{i\tan^{-1}(ax)^3}{3c} + \frac{\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{c} - \frac{i\tan^{-1}(ax)\text{Li}_2\left(-1+\frac{2}{1-iax}\right)}{c} + \frac{\text{Li}_3\left(-1+\frac{}{1}\right.}{2c}$$

Mathematica [B] time = 0.05, size = 243, normalized size = 2.67

$$\frac{\text{Li}_3\left(\frac{-ax-i}{ax-i}\right)}{2c}+\frac{\text{Li}_3\left(-\frac{ax+i}{i-ax}\right)}{2c}-\frac{\text{Li}_3\left(\frac{ax+i}{ax-i}\right)}{2c}+\frac{i\text{Li}_2\left(\frac{-ax-i}{ax-i}\right)\tan^{-1}(ax)}{c}+\frac{i\text{Li}_2\left(-\frac{ax+i}{i-ax}\right)\tan^{-1}(ax)}{c}-\frac{i\text{Li}_2\left(\frac{ax+i}{ax-i}\right)\tan^{-1}(ax)}{c}+$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)),x]
```

```
[Out] ((I/3)*ArcTan[a*x]^3)/c + (2*ArcTan[a*x]^2*ArcTanh[1 - (2*I)/(I - a*x)])/c
+ (ArcTan[a*x]^2*Log[(2*I)/(I - a*x)])/c + (I*ArcTan[a*x]*PolyLog[2, (-I -
a*x)/(-I + a*x)])/c + (I*ArcTan[a*x]*PolyLog[2, -((I + a*x)/(I - a*x))])/c
- (I*ArcTan[a*x]*PolyLog[2, (I + a*x)/(-I + a*x)])/c + PolyLog[3, (-I - a*x
)/(-I + a*x)]/(2*c) + PolyLog[3, -((I + a*x)/(I - a*x))]/(2*c) - PolyLog[3,
 (I + a*x)/(-I + a*x)]/(2*c)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{a^2cx^3+cx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^2*c*x^3 + c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.30, size = 1767, normalized size = 19.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x/(a^2*c*x^2+c),x)
```

```
[Out] -1/2/c*arctan(a*x)^2*ln(a^2*x^2+1)+1/c*arctan(a*x)^2*ln(a*x)+1/c*arctan(a*x
)^2*ln(2)+1/c*arctan(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c*arctan(a*x)
^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*
x^2+1)^(1/2))-1/c*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)-1/3*I*arctan(
a*x)^3/c+1/4*I/c*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+1
/2*I/c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*a
rctan(a*x)^2-1/2*I/c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*
x^2+1)+1))^2*arctan(a*x)^2-1/4*I/c*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2
*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+1/2*I/c*Pi*csgn(I*((1+I*a*x)^2/(a^
2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*arctan(a*x)^2-1/4*I/c*arctan(a*x
)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3-1/2*I/c*Pi*csgn(I/((1+I*a*x)^2/(a^
2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
)^2*arctan(a*x)^2-1/2*I/c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^
2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)
+1))^2*arctan(a*x)^2+1/4*I/c*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+
1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+1/2*I/c*Pi*csgn(I*((1+I*a*x)
^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1
)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2-1/4*I/c*arctan(a*x)^2*Pi*cs
gn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))+1/2*I/c
*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a
^2*x^2+1))^2-1/2*I/c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a*
x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2-1/2*I/c*ar
ctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2
*x^2+1)+1)^2)^2+1/4*I/c*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+1/4*I/c
*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x
^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+1/2*I/c*Pi*csgn(I*((1+I*a*x)^2/(a^2*
x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2
+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2-1/4*I/c*arctan(a*x)^2*Pi*
csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(
I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)-2*I/c*arctan(a*x)*
polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/2*I/c*Pi*arctan(a*x)^2-2*I/c*arct
an(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+2/c*polylog(3,-(1+I*a*x)/(a^
2*x^2+1)^(1/2))+2/c*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{(a^2cx^2+c)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)^2}{x\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^2/(x*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^2(ax)}{a^2x^3+x}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**2/(a**2*x**3 + x), x)/c
```

3.288 $\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)}\,dx$

Optimal. Leaf size=92

$$-\frac{ia\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{c}-\frac{a\tan^{-1}(ax)^3}{3c}-\frac{ia\tan^{-1}(ax)^2}{c}-\frac{\tan^{-1}(ax)^2}{cx}+\frac{2a\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c}$$

```
[Out] -I*a*arctan(a*x)^2/c-arctan(a*x)^2/c/x-1/3*a*arctan(a*x)^3/c+2*a*arctan(a*x
)*ln(2-2/(1-I*a*x))/c-I*a*polylog(2,-1+2/(1-I*a*x))/c
```

Rubi [A] time = 0.20, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4918, 4852, 4924, 4868, 2447, 4884}

$$-\frac{ia\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c}-\frac{a\tan^{-1}(ax)^3}{3c}-\frac{ia\tan^{-1}(ax)^2}{c}-\frac{\tan^{-1}(ax)^2}{cx}+\frac{2a\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] ((-I)*a*ArcTan[a*x]^2)/c - ArcTan[a*x]^2/(c*x) - (a*ArcTan[a*x]^3)/(3*c) +
(2*a*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/c - (I*a*PolyLog[2, -1 + 2/(1 - I*
a*x)])/c
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
```

```
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^2}{c+a^2cx^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx}{c}\\ &= -\frac{\tan^{-1}(ax)^2}{cx}-\frac{a\tan^{-1}(ax)^3}{3c}+\frac{(2a)\int \frac{\tan^{-1}(ax)}{x\left(1+a^2x^2\right)}\,dx}{c}\\ &= -\frac{ia\tan^{-1}(ax)^2}{c}-\frac{\tan^{-1}(ax)^2}{cx}-\frac{a\tan^{-1}(ax)^3}{3c}+\frac{(2ia)\int \frac{\tan^{-1}(ax)}{x(i+ax)}\,dx}{c}\\ &= -\frac{ia\tan^{-1}(ax)^2}{c}-\frac{\tan^{-1}(ax)^2}{cx}-\frac{a\tan^{-1}(ax)^3}{3c}+\frac{2a\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{\left(2a^2\right)\int}{}\\ &= -\frac{ia\tan^{-1}(ax)^2}{c}-\frac{\tan^{-1}(ax)^2}{cx}-\frac{a\tan^{-1}(ax)^3}{3c}+\frac{2a\tan^{-1}(ax)\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{ia\text{Li}_2\left(-\right.}{}\end{aligned}$$

Mathematica [A] time = 0.20, size = 73, normalized size = 0.79

$$\frac{a\left(-i\text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)-\frac{1}{3}\tan^{-1}(ax)\left(\left(\tan^{-1}(ax)+3i\right)\tan^{-1}(ax)+\frac{3\tan^{-1}(ax)}{ax}-6\log\left(1-e^{2i\tan^{-1}(ax)}\right)\right)\right)}{c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] (a*(-1/3*(ArcTan[a*x]*((3*ArcTan[a*x])/(a*x) + ArcTan[a*x]*(3*I + ArcTan[a*
x]) - 6*Log[1 - E^((2*I)*ArcTan[a*x])])) - I*PolyLog[2, E^((2*I)*ArcTan[a*x
])]))/c
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{a^2cx^4+cx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^2*c*x^4 + c*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.12, size = 292, normalized size = 3.17

$$-\frac{\arctan(ax)^2}{cx}-\frac{a\arctan(ax)^3}{3c}+\frac{2a\arctan(ax)\ln(ax)}{c}-\frac{a\arctan(ax)\ln\left(a^2x^2+1\right)}{c}+\frac{ia\ln(ax-i)\ln\left(-\frac{i(ax+i)}{2}\right)}{2c}-\frac{ia}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^2/(a^2*c*x^2+c),x)
```

```
[Out] -arctan(a*x)^2/c/x-1/3*a*arctan(a*x)^3/c+2*a/c*arctan(a*x)*ln(a*x)-a/c*arct
an(a*x)*ln(a^2*x^2+1)+1/2*I*a/c*ln(a*x-I)*ln(-1/2*I*(I+a*x))-1/4*I*a/c*ln(I
+a*x)^2-1/2*I*a/c*ln(I+a*x)*ln(1/2*I*(a*x-I))+1/2*I*a/c*dilog(-1/2*I*(I+a*x
))-1/2*I*a/c*dilog(1/2*I*(a*x-I))+1/2*I*a/c*ln(I+a*x)*ln(a^2*x^2+1)+I*a/c*l
n(a*x)*ln(1+I*a*x)+I*a/c*dilog(1+I*a*x)-I*a/c*dilog(1-I*a*x)-I*a/c*ln(a*x)*
ln(1-I*a*x)+1/4*I*a/c*ln(a*x-I)^2-1/2*I*a/c*ln(a*x-I)*ln(a^2*x^2+1)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)^2}{x^2\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^2(ax)}{a^2x^4+x^2}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**2/(a**2*x**4 + x**2), x)/c
```

3.289 $\int \frac{\tan^{-1}(ax)^2}{x^3(c+a^2cx^2)}\,dx$

Optimal. Leaf size=178

$$-\frac{a^2\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c}+\frac{ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c}-\frac{a^2\log\left(a^2x^2+1\right)}{2c}+\frac{a^2\log(x)}{c}+\frac{ia^2\tan^{-1}(ax)^3}{3c}-\frac{a^2\tan^{-1}(ax)^2}{2c}$$

```
[Out] -a*arctan(a*x)/c/x-1/2*a^2*arctan(a*x)^2/c-1/2*arctan(a*x)^2/c/x^2+1/3*I*a^
2*arctan(a*x)^3/c+a^2*ln(x)/c-1/2*a^2*ln(a^2*x^2+1)/c-a^2*arctan(a*x)^2*ln(
2-2/(1-I*a*x))/c+I*a^2*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))/c-1/2*a^2*poly
log(3,-1+2/(1-I*a*x))/c
```

Rubi [A] time = 0.34, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4918, 4852, 266, 36, 29, 31, 4884, 4924, 4868, 4992, 6610}

$$-\frac{a^2\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c}+\frac{ia^2\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c}-\frac{a^2\log\left(a^2x^2+1\right)}{2c}+\frac{a^2\log(x)}{c}+\frac{ia^2\tan^{-1}(}{3c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] -((a*ArcTan[a*x])/(c*x)) - (a^2*ArcTan[a*x]^2)/(2*c) - ArcTan[a*x]^2/(2*c*x
^2) + ((I/3)*a^2*ArcTan[a*x]^3)/c + (a^2*Log[x])/c - (a^2*Log[1 + a^2*x^2])
/(2*c) - (a^2*ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c + (I*a^2*ArcTan[a*x]*
PolyLog[2, -1 + 2/(1 - I*a*x)])/c - (a^2*PolyLog[3, -1 + 2/(1 - I*a*x)])/(2
*c)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^3}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^2}{2cx^2} + \frac{ia^2\tan^{-1}(ax)^3}{3c} + \frac{a\int \frac{\tan^{-1}(ax)}{x^2\left(1+a^2x^2\right)}\,dx}{c} - \frac{\left(ia^2\right)\int \frac{\tan^{-1}(ax)^2}{x(i+ax)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^2}{2cx^2} + \frac{ia^2\tan^{-1}(ax)^3}{3c} - \frac{a^2\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{c} + \frac{a\int \frac{\tan^{-1}(ax)}{x^2}\,dx}{c} - \frac{a^3\int}{}$$

$$= -\frac{a\tan^{-1}(ax)}{cx} - \frac{a^2\tan^{-1}(ax)^2}{2c} - \frac{\tan^{-1}(ax)^2}{2cx^2} + \frac{ia^2\tan^{-1}(ax)^3}{3c} - \frac{a^2\tan^{-1}(ax)^2\log\left(2-\right.}{c}$$

$$= -\frac{a\tan^{-1}(ax)}{cx} - \frac{a^2\tan^{-1}(ax)^2}{2c} - \frac{\tan^{-1}(ax)^2}{2cx^2} + \frac{ia^2\tan^{-1}(ax)^3}{3c} - \frac{a^2\tan^{-1}(ax)^2\log\left(2-\right.}{c}$$

$$= -\frac{a\tan^{-1}(ax)}{cx} - \frac{a^2\tan^{-1}(ax)^2}{2c} - \frac{\tan^{-1}(ax)^2}{2cx^2} + \frac{ia^2\tan^{-1}(ax)^3}{3c} - \frac{a^2\tan^{-1}(ax)^2\log\left(2-\right.}{c}$$

$$= -\frac{a\tan^{-1}(ax)}{cx} - \frac{a^2\tan^{-1}(ax)^2}{2c} - \frac{\tan^{-1}(ax)^2}{2cx^2} + \frac{ia^2\tan^{-1}(ax)^3}{3c} + \frac{a^2\log(x)}{c} - \frac{a^2\log\left(1+\right.}{2c}$$

Mathematica [A] time = 0.33, size = 142, normalized size = 0.80

$$\frac{a^2\left(\log\left(\frac{ax}{\sqrt{a^2x^2+1}}\right) - \frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{2a^2x^2} - i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) - \frac{1}{2}\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) - \frac{1}{3}i\tan^{-1}(ax)^3 - \frac{\tan^-}{a}\right.}{c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] (a^2*((I/24)*Pi^3 - ArcTan[a*x]/(a*x) - ((1 + a^2*x^2)*ArcTan[a*x]^2)/(2*a^
2*x^2) - (I/3)*ArcTan[a*x]^3 - ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])
] + Log[(a*x)/Sqrt[1 + a^2*x^2]] - I*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTa
n[a*x])] - PolyLog[3, E^((-2*I)*ArcTan[a*x])]/2))/c
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)^2}{a^2cx^5+cx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^2*c*x^5 + c*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.04, size = 5491, normalized size = 30.85

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^3/(a^2*c*x^2+c),x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{(a^2cx^2 + c)x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}(a\,x)^2}{x^3\,\left(c\,a^2\,x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)),x)
[Out] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^2(ax)}{a^2x^5+x^3}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**3/(a**2*c*x**2+c),x)
[Out] Integral(atan(a*x)**2/(a**2*x**5 + x**3), x)/c
```

3.290 $\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)}\,dx$

Optimal. Leaf size=166

$$\frac{4ia^3\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{3c}+\frac{a^3\tan^{-1}(ax)^3}{3c}+\frac{4ia^3\tan^{-1}(ax)^2}{3c}-\frac{a^3\tan^{-1}(ax)}{3c}-\frac{8a^3\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{3c}-\frac{a^2}{3cx}+\frac{a^2\tan}{}$$

```
[Out] -1/3*a^2/c/x-1/3*a^3*arctan(a*x)/c-1/3*a*arctan(a*x)/c/x^2+4/3*I*a^3*arctan
(a*x)^2/c-1/3*arctan(a*x)^2/c/x^3+a^2*arctan(a*x)^2/c/x+1/3*a^3*arctan(a*x)
^3/c-8/3*a^3*arctan(a*x)*ln(2-2/(1-I*a*x))/c+4/3*I*a^3*polylog(2,-1+2/(1-I*
a*x))/c
```

Rubi [A] time = 0.44, antiderivative size = 166, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4918, 4852, 325, 203, 4924, 4868, 2447, 4884}

$$\frac{4ia^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{3c}-\frac{a^2}{3cx}+\frac{a^3\tan^{-1}(ax)^3}{3c}+\frac{4ia^3\tan^{-1}(ax)^2}{3c}-\frac{a^3\tan^{-1}(ax)}{3c}+\frac{a^2\tan^{-1}(ax)^2}{cx}-\frac{8a^3\log\left(2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] -a^2/(3*c*x) - (a^3*ArcTan[a*x])/(3*c) - (a*ArcTan[a*x])/(3*c*x^2) + (((4*I
)/3)*a^3*ArcTan[a*x]^2)/c - ArcTan[a*x]^2/(3*c*x^3) + (a^2*ArcTan[a*x]^2)/(
c*x) + (a^3*ArcTan[a*x]^3)/(3*c) - (8*a^3*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)
])/(3*c) + (((4*I)/3)*a^3*PolyLog[2, -1 + 2/(1 - I*a*x)])/c
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\begin{aligned}
\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^2}{x^4}\,dx}{c}\\
&= -\frac{\tan^{-1}(ax)^2}{3cx^3}+a^4\int \frac{\tan^{-1}(ax)^2}{c+a^2cx^2}\,dx+\frac{(2a)\int \frac{\tan^{-1}(ax)}{x^3\left(1+a^2x^2\right)}\,dx}{3c}-\frac{a^2\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx}{c}\\
&= -\frac{\tan^{-1}(ax)^2}{3cx^3}+\frac{a^2\tan^{-1}(ax)^2}{cx}+\frac{a^3\tan^{-1}(ax)^3}{3c}+\frac{(2a)\int \frac{\tan^{-1}(ax)}{x^3}\,dx}{3c}-\frac{\left(2a^3\right)\int \frac{\tan^{-1}(ax)}{x\left(1+a^2x^2\right)}\,dx}{3c}\\
&= -\frac{a\tan^{-1}(ax)}{3cx^2}+\frac{4ia^3\tan^{-1}(ax)^2}{3c}-\frac{\tan^{-1}(ax)^2}{3cx^3}+\frac{a^2\tan^{-1}(ax)^2}{cx}+\frac{a^3\tan^{-1}(ax)^3}{3c}+\frac{a^2\int \frac{}{x^2(}}{}\\
&= -\frac{a^2}{3cx}-\frac{a\tan^{-1}(ax)}{3cx^2}+\frac{4ia^3\tan^{-1}(ax)^2}{3c}-\frac{\tan^{-1}(ax)^2}{3cx^3}+\frac{a^2\tan^{-1}(ax)^2}{cx}+\frac{a^3\tan^{-1}(ax)^3}{3c}-\frac{8}{}\\
&= -\frac{a^2}{3cx}-\frac{a^3\tan^{-1}(ax)}{3c}-\frac{a\tan^{-1}(ax)}{3cx^2}+\frac{4ia^3\tan^{-1}(ax)^2}{3c}-\frac{\tan^{-1}(ax)^2}{3cx^3}+\frac{a^2\tan^{-1}(ax)^2}{cx}+\frac{a^3}{}
\end{aligned}$$

Mathematica [A] time = 0.38, size = 120, normalized size = 0.72

$$\frac{a^3\left(-\frac{\frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{a^2x^2}-4\tan^{-1}(ax)^2+1}{ax}+\tan^{-1}(ax)\left(-\frac{a^2x^2+1}{a^2x^2}+\tan^{-1}(ax)\left(\tan^{-1}(ax)+4i\right)-8\log\left(1-e^{2i\tan^{-1}(ax)}\right)\right)+4i\right.}{3c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)),x]
```

[Out] (a^3*(-((1 - 4*ArcTan[a*x]^2 + ((1 + a^2*x^2)*ArcTan[a*x]^2)/(a^2*x^2))/(a*x)) + ArcTan[a*x]*(-((1 + a^2*x^2)/(a^2*x^2)) + ArcTan[a*x]*(4*I + ArcTan[a*x]) - 8*Log[1 - E^((2*I)*ArcTan[a*x])]) + (4*I)*PolyLog[2, E^((2*I)*ArcTan[a*x])]))/(3*c)

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{a^2cx^6+cx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c),x, algorithm="fricas")

[Out] integral(arctan(a*x)^2/(a^2*c*x^6 + c*x^4), x)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c),x, algorithm="giac")

[Out] sage0*x

maple [B] time = 0.12, size = 374, normalized size = 2.25

$$-\frac{\arctan(ax)^2}{3c\,x^3}+\frac{a^2\arctan(ax)^2}{cx}+\frac{a^3\arctan(ax)^3}{3c}-\frac{a\arctan(ax)}{3c\,x^2}-\frac{8a^3\arctan(ax)\ln(ax)}{3c}+\frac{4a^3\arctan(ax)\ln(a}{3c}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)^2/x^4/(a^2*c*x^2+c),x)

[Out] -1/3*arctan(a*x)^2/c/x^3+a^2*arctan(a*x)^2/c/x+1/3*a^3*arctan(a*x)^3/c-1/3*a*arctan(a*x)/c/x^2-8/3*a^3/c*arctan(a*x)*ln(a*x)+4/3*a^3/c*arctan(a*x)*ln(a^2*x^2+1)-1/3*a^2/c/x-1/3*a^3*arctan(a*x)/c-2/3*I*a^3/c*dilog(-1/2*I*(I+a*x))-1/3*I*a^3/c*ln(a*x-I)^2+4/3*I*a^3/c*ln(a*x)*ln(1-I*a*x)-2/3*I*a^3/c*ln(I+a*x)*ln(a^2*x^2+1)-4/3*I*a^3/c*dilog(1+I*a*x)+2/3*I*a^3/c*ln(a*x-I)*ln(a^2*x^2+1)+2/3*I*a^3/c*ln(I+a*x)*ln(1/2*I*(a*x-I))+4/3*I*a^3/c*dilog(1-I*a*x)-4/3*I*a^3/c*ln(a*x)*ln(1+I*a*x)+1/3*I*a^3/c*ln(I+a*x)^2-2/3*I*a^3/c*ln(a*x-I)*ln(-1/2*I*(I+a*x))+2/3*I*a^3/c*dilog(1/2*I*(a*x-I))

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c),x, algorithm="maxima")

[Out] Timed out

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)^2}{x^4\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)),x)

```
[Out] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^2(ax)}{a^2x^6+x^4}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**4/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**2/(a**2*x**6 + x**4), x)/c
```

3.291 $\int \frac{x^3 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=192

$$-\frac{\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{2a^4c^2}-\frac{i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{a^4c^2}-\frac{i\tan^{-1}(ax)^3}{3a^4c^2}-\frac{\tan^{-1}(ax)^2}{4a^4c^2}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^2}{a^4c^2}-\frac{1}{4a^4c^2\left(a^2x^2+\right.}$$

```
[Out] -1/4/a^4/c^2/(a^2*x^2+1)-1/2*x*arctan(a*x)/a^3/c^2/(a^2*x^2+1)-1/4*arctan(a
*x)^2/a^4/c^2+1/2*arctan(a*x)^2/a^4/c^2/(a^2*x^2+1)-1/3*I*arctan(a*x)^3/a^4
/c^2-arctan(a*x)^2*ln(2/(1+I*a*x))/a^4/c^2-I*arctan(a*x)*polylog(2,1-2/(1+I
*a*x))/a^4/c^2-1/2*polylog(3,1-2/(1+I*a*x))/a^4/c^2
```

Rubi [A] time = 0.29, antiderivative size = 192, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.409$, Rules used = {4964, 4920, 4854, 4884, 4994, 6610, 4930, 4892, 261}

$$-\frac{\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^4c^2}-\frac{i\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^4c^2}-\frac{1}{4a^4c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^2}{2a^4c^2\left(a^2x^2+1\right)}-\frac{x\tan^{-1}(a}{2a^3c^2\left(a^2x^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] -1/(4*a^4*c^2*(1 + a^2*x^2)) - (x*ArcTan[a*x])/(2*a^3*c^2*(1 + a^2*x^2)) -
ArcTan[a*x]^2/(4*a^4*c^2) + ArcTan[a*x]^2/(2*a^4*c^2*(1 + a^2*x^2)) - ((I/3
)*ArcTan[a*x]^3)/(a^4*c^2) - (ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/(a^4*c^2) -
 (I*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^4*c^2) - PolyLog[3, 1 - 2
/(1 + I*a*x)]/(2*a^4*c^2)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx}{a^2} + \frac{\int \frac{x\tan^{-1}(ax)^2}{c+a^2cx^2}\,dx}{a^2c}$$

$$= \frac{\tan^{-1}(ax)^2}{2a^4c^2\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^3}{3a^4c^2} - \frac{\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{a^3} - \frac{\int \frac{\tan^{-1}(ax)^2}{i-ax}\,dx}{a^3c^2}$$

$$= -\frac{x\tan^{-1}(ax)}{2a^3c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^2}{4a^4c^2} + \frac{\tan^{-1}(ax)^2}{2a^4c^2\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^3}{3a^4c^2} - \frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right.}{a^4c^2}$$

$$= -\frac{1}{4a^4c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)}{2a^3c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^2}{4a^4c^2} + \frac{\tan^{-1}(ax)^2}{2a^4c^2\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^3}{3a^4c^2} - \cdots$$

$$= -\frac{1}{4a^4c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)}{2a^3c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^2}{4a^4c^2} + \frac{\tan^{-1}(ax)^2}{2a^4c^2\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^3}{3a^4c^2} - \cdots$$

Mathematica [A] time = 0.19, size = 117, normalized size = 0.61

$$\frac{i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)-\frac{1}{2}\mathrm{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right)+\frac{1}{3}i\tan^{-1}(ax)^3-\tan^{-1}(ax)^2\log\left(1+e^{2i\tan^{-1}(ax)}\right)-\frac{1}{4}\tan^{-1}(}{a^4c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] ((I/3)*ArcTan[a*x]^3 + ((-1 + 2*ArcTan[a*x]^2)*Cos[2*ArcTan[a*x]])/8 - ArcT
an[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] + I*ArcTan[a*x]*PolyLog[2, -E^((2*
I)*ArcTan[a*x])] - PolyLog[3, -E^((2*I)*ArcTan[a*x])]/2 - (ArcTan[a*x]*Sin[
2*ArcTan[a*x]])/4)/(a^4*c^2)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^3\arctan(ax)^2}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(x^3*arctan(a*x)^2/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.86, size = 1092, normalized size = 5.69

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/a^4/c^2*arctan(a*x)/(8*I+8*a*x)+1/16/a^3/c^2/(a*x-I)*x+1/16/a^3/c^2/(I+a
*x)*x-1/a^4/c^2*arctan(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+I/a^4/c^2*arc
tan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))-1/2*I/a^4/c^2*csgn(I*(1+I*a*x)
^2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*Pi+1/4*
I/a^4/c^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2
))^2*arctan(a*x)^2*Pi-1/4*I/a^4/c^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*c
sgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2*Pi-1/4*arctan(a*x)^2/a^4
/c^2+I/a^3/c^2*arctan(a*x)/(8*a*x-8*I)*x-I/a^3/c^2*arctan(a*x)/(8*I+8*a*x)*
x+1/4*I/a^4/c^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*arctan(a*x)^2*Pi+1/4*I/a^
4/c^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arcta
n(a*x)^2*Pi-1/4*I/a^4/c^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*
x)^2*Pi-1/2/a^4/c^2*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))+1/2*arctan(a*x)^2/a
^4/c^2/(a^2*x^2+1)+1/2/a^4/c^2*arctan(a*x)^2*ln(a^2*x^2+1)-1/16*I/a^4/c^2/(
I+a*x)+1/3*I/a^4/c^2*arctan(a*x)^3+1/16*I/a^4/c^2/(a*x-I)-1/a^4/c^2*ln(2)*a
rctan(a*x)^2-1/a^4/c^2*arctan(a*x)/(8*a*x-8*I)-1/4*I/a^4/c^2*csgn(I*(1+I*a*
x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1
)^2)^2*arctan(a*x)^2*Pi-1/4*I/a^4/c^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)
*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x
)^2*Pi+1/2*I/a^4/c^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*csgn(I*((1+I*a
```

```
*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2*Pi+1/4*I/a^4/c^2*csgn(I*(1+I*a*x)^2/(a^
2*x^2+1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2
+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2*Pi
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan(ax)^2}{\left(a^2cx^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2 + c)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3 \operatorname{atan}(a\,x)^2}{\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \operatorname{atan}^2(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**2/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**3*atan(a*x)**2/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.292 $\int \frac{x^2 \tan^{-1}(ax)^2}{(c+a^2cx^2)^2} dx$

Optimal. Leaf size=106

$$\frac{\tan^{-1}(ax)^3}{6a^3c^2} + \frac{\tan^{-1}(ax)}{4a^3c^2} + \frac{x}{4a^2c^2(a^2x^2+1)} - \frac{x\tan^{-1}(ax)^2}{2a^2c^2(a^2x^2+1)} - \frac{\tan^{-1}(ax)}{2a^3c^2(a^2x^2+1)}$$

```
[Out] 1/4*x/a^2/c^2/(a^2*x^2+1)+1/4*arctan(a*x)/a^3/c^2-1/2*arctan(a*x)/a^3/c^2/(
a^2*x^2+1)-1/2*x*arctan(a*x)^2/a^2/c^2/(a^2*x^2+1)+1/6*arctan(a*x)^3/a^3/c^
2
```

Rubi [A] time = 0.11, antiderivative size = 106, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4936, 4930, 199, 205}

$$\frac{x}{4a^2c^2(a^2x^2+1)} - \frac{x\tan^{-1}(ax)^2}{2a^2c^2(a^2x^2+1)} - \frac{\tan^{-1}(ax)}{2a^3c^2(a^2x^2+1)} + \frac{\tan^{-1}(ax)^3}{6a^3c^2} + \frac{\tan^{-1}(ax)}{4a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] x/(4*a^2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]/(4*a^3*c^2) - ArcTan[a*x]/(2*a^3*
c^2*(1 + a^2*x^2)) - (x*ArcTan[a*x]^2)/(2*a^2*c^2*(1 + a^2*x^2)) + ArcTan[a
*x]^3/(6*a^3*c^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{x\tan^{-1}(ax)^2}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6a^3c^2} + \frac{\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{a}$$

$$= -\frac{\tan^{-1}(ax)}{2a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^2}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6a^3c^2} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx}{2a^2}$$

$$= \frac{x}{4a^2c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{2a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^2}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6a^3c^2} + \frac{\int \frac{1}{c+a^2cx^2}\,dx}{4a^2c}$$

$$= \frac{x}{4a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)}{4a^3c^2} - \frac{\tan^{-1}(ax)}{2a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^2}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6a^3c^2}$$

Mathematica [A] time = 0.09, size = 68, normalized size = 0.64

$$\frac{2\left(a^2x^2+1\right)\tan^{-1}(ax)^3 + 3\left(a^2x^2-1\right)\tan^{-1}(ax) + 3ax - 6ax\tan^{-1}(ax)^2}{12a^3c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (3*a*x + 3*(-1 + a^2*x^2)*ArcTan[a*x] - 6*a*x*ArcTan[a*x]^2 + 2*(1 + a^2*x^
2)*ArcTan[a*x]^3)/(12*a^3*c^2*(1 + a^2*x^2))
```

fricas [A] time = 1.22, size = 69, normalized size = 0.65

$$-\frac{6\,ax\arctan\left(ax\right)^2 - 2\left(a^2x^2+1\right)\arctan\left(ax\right)^3 - 3\,ax - 3\left(a^2x^2-1\right)\arctan\left(ax\right)}{12\left(a^5c^2x^2 + a^3c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] -1/12*(6*a*x*arctan(a*x)^2 - 2*(a^2*x^2 + 1)*arctan(a*x)^3 - 3*a*x - 3*(a^2
*x^2 - 1)*arctan(a*x))/(a^5*c^2*x^2 + a^3*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 97, normalized size = 0.92

$$\frac{x}{4a^2c^2\left(a^2x^2+1\right)} + \frac{\arctan\left(ax\right)}{4a^3c^2} - \frac{\arctan\left(ax\right)}{2a^3c^2\left(a^2x^2+1\right)} - \frac{x\arctan\left(ax\right)^2}{2a^2c^2\left(a^2x^2+1\right)} + \frac{\arctan\left(ax\right)^3}{6a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/4*x/a^2/c^2/(a^2*x^2+1)+1/4*arctan(a*x)/a^3/c^2-1/2*arctan(a*x)/a^3/c^2/(
a^2*x^2+1)-1/2*x*arctan(a*x)^2/a^2/c^2/(a^2*x^2+1)+1/6*arctan(a*x)^3/a^3/c^
2
```

maxima [A] time = 0.45, size = 151, normalized size = 1.42

$$-\frac{1}{2}\left(\frac{x}{a^4c^2x^2+a^2c^2}-\frac{\arctan(ax)}{a^3c^2}\right)\arctan(ax)^2+\frac{\left(2\left(a^2x^2+1\right)\arctan(ax)^3+3\,ax+3\left(a^2x^2+1\right)\arctan(ax)\right)a}{12\left(a^7c^2x^2+a^5c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] -1/2*(x/(a^4*c^2*x^2 + a^2*c^2) - arctan(a*x)/(a^3*c^2))*arctan(a*x)^2 + 1/
12*(2*(a^2*x^2 + 1)*arctan(a*x)^3 + 3*a*x + 3*(a^2*x^2 + 1)*arctan(a*x))*a^
2/(a^7*c^2*x^2 + a^5*c^2) - 1/2*((a^2*x^2 + 1)*arctan(a*x)^2 + 1)*a*arctan(
a*x)/(a^6*c^2*x^2 + a^4*c^2)
```

mupad [B] time = 0.42, size = 96, normalized size = 0.91

$$\frac{x}{2\left(2\,a^4\,c^2\,x^2+2\,a^2\,c^2\right)}+\frac{\mathrm{atan}\left(a\,x\right)}{4\,a^3\,c^2}+\frac{{\mathrm{atan}\left(a\,x\right)}^3}{6\,a^3\,c^2}-\frac{\mathrm{atan}\left(a\,x\right)}{2\,a^5\,c^2\,\left(\frac{1}{a^2}+x^2\right)}-\frac{x\,{\mathrm{atan}\left(a\,x\right)}^2}{2\,a^4\,c^2\,\left(\frac{1}{a^2}+x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^2,x)
```

```
[Out] x/(2*(2*a^2*c^2 + 2*a^4*c^2*x^2)) + atan(a*x)/(4*a^3*c^2) + atan(a*x)^3/(6*
a^3*c^2) - atan(a*x)/(2*a^5*c^2*(1/a^2 + x^2)) - (x*atan(a*x)^2)/(2*a^4*c^2
*(1/a^2 + x^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2\,\mathrm{atan}^2\,(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**2/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**2*atan(a*x)**2/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.293 $\int \frac{x\tan^{-1}(ax)^2}{(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=91

$$\frac{1}{4a^2c^2(a^2x^2+1)} - \frac{\tan^{-1}(ax)^2}{2a^2c^2(a^2x^2+1)} + \frac{x\tan^{-1}(ax)}{2ac^2(a^2x^2+1)} + \frac{\tan^{-1}(ax)^2}{4a^2c^2}$$

```
[Out] 1/4/a^2/c^2/(a^2*x^2+1)+1/2*x*arctan(a*x)/a/c^2/(a^2*x^2+1)+1/4*arctan(a*x)
^2/a^2/c^2-1/2*arctan(a*x)^2/a^2/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.07, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}} = 0.150$, Rules used = {4930, 4892, 261}

$$\frac{1}{4a^2c^2(a^2x^2+1)} - \frac{\tan^{-1}(ax)^2}{2a^2c^2(a^2x^2+1)} + \frac{x\tan^{-1}(ax)}{2ac^2(a^2x^2+1)} + \frac{\tan^{-1}(ax)^2}{4a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] 1/(4*a^2*c^2*(1 + a^2*x^2)) + (x*ArcTan[a*x])/(2*a*c^2*(1 + a^2*x^2)) + Arc
Tan[a*x]^2/(4*a^2*c^2) - ArcTan[a*x]^2/(2*a^2*c^2*(1 + a^2*x^2))
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\tan^{-1}(ax)^2}{(c+a^2cx^2)^2}\,dx &= -\frac{\tan^{-1}(ax)^2}{2a^2c^2(1+a^2x^2)} + \frac{\int \frac{\tan^{-1}(ax)}{(c+a^2cx^2)^2}\,dx}{a}\\
&= \frac{x\tan^{-1}(ax)}{2ac^2(1+a^2x^2)} + \frac{\tan^{-1}(ax)^2}{4a^2c^2} - \frac{\tan^{-1}(ax)^2}{2a^2c^2(1+a^2x^2)} - \frac{1}{2}\int \frac{x}{(c+a^2cx^2)^2}\,dx\\
&= \frac{1}{4a^2c^2(1+a^2x^2)} + \frac{x\tan^{-1}(ax)}{2ac^2(1+a^2x^2)} + \frac{\tan^{-1}(ax)^2}{4a^2c^2} - \frac{\tan^{-1}(ax)^2}{2a^2c^2(1+a^2x^2)}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 47, normalized size = 0.52

$$\frac{\left(a^2x^2-1\right)\tan^{-1}(ax)^2+2ax\tan^{-1}(ax)+1}{4a^2c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (1 + 2*a*x*ArcTan[a*x] + (-1 + a^2*x^2)*ArcTan[a*x]^2)/(4*a^2*c^2*(1 + a^2*
x^2))
```

fricas [A] time = 0.58, size = 48, normalized size = 0.53

$$\frac{2\,ax\arctan\left(ax\right)+\left(a^2x^2-1\right)\arctan\left(ax\right)^2+1}{4\left(a^4c^2x^2+a^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] 1/4*(2*a*x*arctan(a*x) + (a^2*x^2 - 1)*arctan(a*x)^2 + 1)/(a^4*c^2*x^2 + a^
2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 84, normalized size = 0.92

$$\frac{1}{4a^2c^2\left(a^2x^2+1\right)}+\frac{x\arctan\left(ax\right)}{2a\,c^2\left(a^2x^2+1\right)}+\frac{\arctan\left(ax\right)^2}{4a^2c^2}-\frac{\arctan\left(ax\right)^2}{2a^2c^2\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^2/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/4/a^2/c^2/(a^2*x^2+1)+1/2*x*arctan(a*x)/a/c^2/(a^2*x^2+1)+1/4*arctan(a*x)
^2/a^2/c^2-1/2*arctan(a*x)^2/a^2/c^2/(a^2*x^2+1)
```

maxima [A] time = 0.42, size = 104, normalized size = 1.14

$$\frac{\left(\frac{x}{a^2cx^2+c}+\frac{\arctan(ax)}{ac}\right)\arctan\left(ax\right)}{2\,ac}-\frac{\left(a^2x^2+1\right)\arctan\left(ax\right)^2-1}{4\left(a^4cx^2+a^2c\right)c}-\frac{\arctan\left(ax\right)^2}{2\left(a^2cx^2+c\right)a^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(x/(a^2*c*x^2 + c) + arctan(a*x)/(a*c))*arctan(a*x)/(a*c) - 1/4*((a^2*x
^2 + 1)*arctan(a*x)^2 - 1)/((a^4*c*x^2 + a^2*c)*c) - 1/2*arctan(a*x)^2/((a^
2*c*x^2 + c)*a^2*c)
```

mupad [B] time = 0.42, size = 50, normalized size = 0.55

$$\frac{a^2\,x^2\,\mathrm{atan}\left(a\,x\right)^2+2\,a\,x\,\mathrm{atan}\left(a\,x\right)-\mathrm{atan}\left(a\,x\right)^2+1}{4\,a^2\,c^2\,\left(a^2\,x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^2,x)
```

```
[Out] (2*a*x*atan(a*x) - atan(a*x)^2 + a^2*x^2*atan(a*x)^2 + 1)/(4*a^2*c^2*(a^2*x
^2 + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^2(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**2/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x*atan(a*x)**2/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.294 $\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=100

$$-\frac{x}{4c^2\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{2ac^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^3}{6ac^2}-\frac{\tan^{-1}(ax)}{4ac^2}$$

```
[Out] -1/4*x/c^2/(a^2*x^2+1)-1/4*arctan(a*x)/a/c^2+1/2*arctan(a*x)/a/c^2/(a^2*x^2
+1)+1/2*x*arctan(a*x)^2/c^2/(a^2*x^2+1)+1/6*arctan(a*x)^3/a/c^2
```

Rubi [A] time = 0.07, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {4892, 4930, 199, 205}

$$-\frac{x}{4c^2\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{2ac^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^3}{6ac^2}-\frac{\tan^{-1}(ax)}{4ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(c + a^2*c*x^2)^2,x]
```

```
[Out] -x/(4*c^2*(1 + a^2*x^2)) - ArcTan[a*x]/(4*a*c^2) + ArcTan[a*x]/(2*a*c^2*(1
+ a^2*x^2)) + (x*ArcTan[a*x]^2)/(2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^3/(6*a*
c^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx = \frac{x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6ac^2} - a\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx$$
$$= \frac{\tan^{-1}(ax)}{2ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6ac^2} - \frac{1}{2}\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx$$
$$= -\frac{x}{4c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)}{2ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6ac^2} - \frac{\int \frac{1}{c+a^2cx^2}\,dx}{4c}$$
$$= -\frac{x}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{4ac^2} + \frac{\tan^{-1}(ax)}{2ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6ac^2}$$

Mathematica [A] time = 0.04, size = 65, normalized size = 0.65

$$\frac{2\left(a^2x^2+1\right)\tan^{-1}(ax)^3 + \left(3-3a^2x^2\right)\tan^{-1}(ax) - 3ax + 6ax\tan^{-1}(ax)^2}{12c^2\left(a^3x^2+a\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^2/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-3*a*x + (3 - 3*a^2*x^2)*ArcTan[a*x] + 6*a*x*ArcTan[a*x]^2 + 2*(1 + a^2*x^
2)*ArcTan[a*x]^3)/(12*c^2*(a + a^3*x^2))
```

fricas [A] time = 0.55, size = 67, normalized size = 0.67

$$\frac{6\,ax\arctan(ax)^2 + 2\left(a^2x^2+1\right)\arctan(ax)^3 - 3\,ax - 3\left(a^2x^2-1\right)\arctan(ax)}{12\left(a^3c^2x^2+ac^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] 1/12*(6*a*x*arctan(a*x)^2 + 2*(a^2*x^2 + 1)*arctan(a*x)^3 - 3*a*x - 3*(a^2*
x^2 - 1)*arctan(a*x))/(a^3*c^2*x^2 + a*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 91, normalized size = 0.91

$$-\frac{x}{4c^2\left(a^2x^2+1\right)} - \frac{\arctan(ax)}{4a\,c^2} + \frac{\arctan(ax)}{2a\,c^2\left(a^2x^2+1\right)} + \frac{x\arctan(ax)^2}{2c^2\left(a^2x^2+1\right)} + \frac{\arctan(ax)^3}{6a\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/4*x/c^2/(a^2*x^2+1)-1/4*arctan(a*x)/a/c^2+1/2*arctan(a*x)/a/c^2/(a^2*x^2
+1)+1/2*x*arctan(a*x)^2/c^2/(a^2*x^2+1)+1/6*arctan(a*x)^3/a/c^2
```

maxima [A] time = 0.45, size = 146, normalized size = 1.46

$$\frac{1}{2}\left(\frac{x}{a^2c^2x^2+c^2}+\frac{\arctan(ax)}{ac^2}\right)\arctan(ax)^2+\frac{\left(2\left(a^2x^2+1\right)\arctan(ax)^3-3\,ax-3\left(a^2x^2+1\right)\arctan(ax)\right)a^2}{12\left(a^5c^2x^2+a^3c^2\right)}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(x/(a^2*c^2*x^2 + c^2) + arctan(a*x)/(a*c^2))*arctan(a*x)^2 + 1/12*(2*(
a^2*x^2 + 1)*arctan(a*x)^3 - 3*a*x - 3*(a^2*x^2 + 1)*arctan(a*x))*a^2/(a^5*
c^2*x^2 + a^3*c^2) - 1/2*((a^2*x^2 + 1)*arctan(a*x)^2 - 1)*a*arctan(a*x)/(a
^4*c^2*x^2 + a^2*c^2)
```

mupad [B] time = 0.52, size = 101, normalized size = 1.01

$$\frac{\operatorname{atan}(a\,x)}{2\left(a^3\,c^2\,x^2+a\,c^2\right)}-\frac{x}{2\left(2\,a^2\,c^2\,x^2+2\,c^2\right)}+\frac{x\operatorname{atan}(a\,x)^2}{2\left(a^2\,c^2\,x^2+c^2\right)}-\frac{\operatorname{atan}(a\,x)}{4\,a\,c^2}+\frac{\operatorname{atan}(a\,x)^3}{6\,a\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(c + a^2*c*x^2)^2,x)
```

```
[Out] atan(a*x)/(2*(a*c^2 + a^3*c^2*x^2)) - x/(2*(2*c^2 + 2*a^2*c^2*x^2)) + (x*at
an(a*x)^2)/(2*(c^2 + a^2*c^2*x^2)) - atan(a*x)/(4*a*c^2) + atan(a*x)^3/(6*a
*c^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^2(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**2/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.295 $\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=170

$$-\frac{1}{4c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}-\frac{ax\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}+\frac{\mathrm{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c^2}-\frac{i\mathrm{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c^2}-\frac{i\tan^{-1}(ax)^3}{3c^2}-\frac{\tan^{-1}}{4\ldots}$$

```
[Out] -1/4/c^2/(a^2*x^2+1)-1/2*a*x*arctan(a*x)/c^2/(a^2*x^2+1)-1/4*arctan(a*x)^2/
c^2+1/2*arctan(a*x)^2/c^2/(a^2*x^2+1)-1/3*I*arctan(a*x)^3/c^2+arctan(a*x)^2
*ln(2-2/(1-I*a*x))/c^2-I*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))/c^2+1/2*poly
log(3,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.31, antiderivative size = 170, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4966, 4924, 4868, 4884, 4992, 6610, 4930, 4892, 261}

$$\frac{\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^2}-\frac{i\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^2}-\frac{1}{4c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}-\frac{ax\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}-\frac{i}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^2),x]
```

```
[Out] -1/(4*c^2*(1 + a^2*x^2)) - (a*x*ArcTan[a*x])/(2*c^2*(1 + a^2*x^2)) - ArcTan
[a*x]^2/(4*c^2) + ArcTan[a*x]^2/(2*c^2*(1 + a^2*x^2)) - ((I/3)*ArcTan[a*x]^
3)/c^2 + (ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c^2 - (I*ArcTan[a*x]*PolyLo
g[2, -1 + 2/(1 - I*a*x)])/c^2 + PolyLog[3, -1 + 2/(1 - I*a*x)]/(2*c^2)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^3}{3c^2}-a\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx+\frac{i\int \frac{\tan^{-1}(ax)^2}{x(i+ax)}\,dx}{c^2}$$

$$= -\frac{ax\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)^2}{4c^2}+\frac{\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^3}{3c^2}+\frac{\tan^{-1}(ax)^2\log\left(2-\ldots\right.}{c^2}$$

$$= -\frac{1}{4c^2\left(1+a^2x^2\right)}-\frac{ax\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)^2}{4c^2}+\frac{\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^3}{3c^2}+\ldots$$

$$= -\frac{1}{4c^2\left(1+a^2x^2\right)}-\frac{ax\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)^2}{4c^2}+\frac{\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^3}{3c^2}+\ldots$$

Mathematica [A] time = 0.21, size = 119, normalized size = 0.70

$$\frac{24i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)+12\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)+8i\tan^{-1}(ax)^3+24\tan^{-1}(ax)^2\log\left(1-e^{-2i\tan^{-1}(ax)}\right)-6\tan}{24c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^2),x]
```

```
[Out] ((-I)*Pi^3 + (8*I)*ArcTan[a*x]^3 - 3*Cos[2*ArcTan[a*x]] + 6*ArcTan[a*x]^2*C
os[2*ArcTan[a*x]] + 24*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + (24*
I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + 12*PolyLog[3, E^((-2*I)
*ArcTan[a*x])] - 6*ArcTan[a*x]*Sin[2*ArcTan[a*x]])/(24*c^2)
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)^2}{a^4c^2x^5+2\,a^2c^2x^3+c^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.10, size = 1936, normalized size = 11.39

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/16/c^2/(a*x-I)*a*x+1/16/c^2/(I+a*x)*a*x-1/4*arctan(a*x)^2/c^2+1/2*arctan(
a*x)^2/c^2/(a^2*x^2+1)-1/3*I*arctan(a*x)^3/c^2-1/4*I/c^2*arctan(a*x)^2*Pi*c
sgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I
*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+1/2*I/c^2*Pi*csgn(I
*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((
1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2+1/2*I/
c^2*Pi*arctan(a*x)^2-2*I/c^2*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1
/2))-2*I/c^2*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/2*I/c^2*
Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1
+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+1/4*I
/c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*
x)^2/(a^2*x^2+1)+1)^2)+1/4*I/c^2*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*
x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^
2+1/4*I/c^2*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*
x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+2/c^2*polylog(3,-(1+I*a*x
)/(a^2*x^2+1)^(1/2))+2/c^2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/2*I/c^2
*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*arcta
n(a*x)^2-1/4*I/c^2*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3+1/4*I
/c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3-1/16*I/c^2/(I
```

```
+a*x)+1/c^2*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/c^2*arctan(a*
x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+1/c^2*arctan(a*x)^2*ln(a*x)-1/2/c^2*arct
an(a*x)^2*ln(a^2*x^2+1)-1/c^2*arctan(a*x)/(8*a*x-8*I)-1/c^2*arctan(a*x)/(8*
I+8*a*x)+1/c^2*arctan(a*x)^2*ln(2)+1/c^2*arctan(a*x)^2*ln((1+I*a*x)/(a^2*x^
2+1)^(1/2))+1/c^2*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/16*I/c^
2/(a*x-I)+I/c^2*arctan(a*x)/(8*a*x-8*I)*a*x-1/2*I/c^2*Pi*csgn(I/((1+I*a*x)^
2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+
1)+1))^2*arctan(a*x)^2+1/2*I/c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+
I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2
*x^2+1)+1))*arctan(a*x)^2-1/4*I/c^2*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)/(a^2*
x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))-I/c^2*arctan(a*x)/(8*I+8*a*
x)*a*x+1/2*I/c^2*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(
I*(1+I*a*x)^2/(a^2*x^2+1))^2-1/2*I/c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1
))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan
(a*x)^2-1/2*I/c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+1/2*I/c^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2
+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3*arctan(a*x)^2-1/2*I/c^2*Pi*csgn(((1+I
*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2-1/4*I/c
^2*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)
+1)^2)^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{(a^2cx^2+c)^2 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)^2}{x\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^2(ax)}{a^4x^5+2a^2x^3+x}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**2/(a**4*x**5 + 2*a**2*x**3 + x), x)/c**2
```

3.296 $\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=177

$$\frac{a^2x}{4c^2\left(a^2x^2+1\right)}-\frac{a^2x\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}-\frac{a\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}-\frac{ia\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{c^2}-\frac{a\tan^{-1}(ax)^3}{2c^2}-\frac{\tan^{-1}(ax)^2}{c^2x}-\frac{ia\tan^{-1}(ax)^2}{c^2}+\frac{a\,\text{ta}}{}$$

```
[Out] 1/4*a^2*x/c^2/(a^2*x^2+1)+1/4*a*arctan(a*x)/c^2-1/2*a*arctan(a*x)/c^2/(a^2*
x^2+1)-I*a*arctan(a*x)^2/c^2-arctan(a*x)^2/c^2/x-1/2*a^2*x*arctan(a*x)^2/c^
2/(a^2*x^2+1)-1/2*a*arctan(a*x)^3/c^2+2*a*arctan(a*x)*ln(2-2/(1-I*a*x))/c^2
-I*a*polylog(2,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.34, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4966, 4918, 4852, 4924, 4868, 2447, 4884, 4892, 4930, 199, 205}

$$-\frac{ia\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^2}+\frac{a^2x}{4c^2\left(a^2x^2+1\right)}-\frac{a^2x\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}-\frac{a\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}-\frac{a\tan^{-1}(ax)^3}{2c^2}-\frac{\tan^{-1}(ax)^2}{c^2x}-\frac{ia\tan^{-1}}{c^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^2),x]
```

```
[Out] (a^2*x)/(4*c^2*(1 + a^2*x^2)) + (a*ArcTan[a*x])/(4*c^2) - (a*ArcTan[a*x])/(
2*c^2*(1 + a^2*x^2)) - (I*a*ArcTan[a*x]^2)/c^2 - ArcTan[a*x]^2/(c^2*x) - (a
^2*x*ArcTan[a*x]^2)/(2*c^2*(1 + a^2*x^2)) - (a*ArcTan[a*x]^3)/(2*c^2) + (2*
a*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/c^2 - (I*a*PolyLog[2, -1 + 2/(1 - I*a
*x)])/c^2
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
```

```
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{a^2x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)^3}{6c^2} + a^3\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx}{c^2} - \frac{a^2\int \frac{\tan^{-1}(ax)^2}{c+a^2cx^2}}{c}$$

$$= -\frac{a\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^2}{c^2x} - \frac{a^2x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)^3}{2c^2} + \frac{1}{2}a^2\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx$$

$$= \frac{a^2x}{4c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{ia\tan^{-1}(ax)^2}{c^2} - \frac{\tan^{-1}(ax)^2}{c^2x} - \frac{a^2x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-}}{2c}$$

$$= \frac{a^2x}{4c^2\left(1+a^2x^2\right)} + \frac{a\tan^{-1}(ax)}{4c^2} - \frac{a\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{ia\tan^{-1}(ax)^2}{c^2} - \frac{\tan^{-1}(ax)^2}{c^2x} - \frac{a^2x\tan^{-1}}{2c^2\left(1+\right.}$$

$$= \frac{a^2x}{4c^2\left(1+a^2x^2\right)} + \frac{a\tan^{-1}(ax)}{4c^2} - \frac{a\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{ia\tan^{-1}(ax)^2}{c^2} - \frac{\tan^{-1}(ax)^2}{c^2x} - \frac{a^2x\tan^{-1}}{2c^2\left(1+\right.}$$

Mathematica [A] time = 0.34, size = 109, normalized size = 0.62

$$-\frac{8iax\mathrm{Li}_2\left(e^{2i\tan^{-1}(ax)}\right) + 4ax\tan^{-1}(ax)^3 + 2\tan^{-1}(ax)^2\left(4iax + ax\sin\left(2\tan^{-1}(ax)\right) + 4\right) - ax\sin\left(2\tan^{-1}(ax)\right) +}{8c^2x}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^2),x]
```

```
[Out] -1/8*(4*a*x*ArcTan[a*x]^3 + 2*a*x*ArcTan[a*x]*(Cos[2*ArcTan[a*x]] - 8*Log[1
 - E^((2*I)*ArcTan[a*x])]) + (8*I)*a*x*PolyLog[2, E^((2*I)*ArcTan[a*x])] -
a*x*Sin[2*ArcTan[a*x]] + 2*ArcTan[a*x]^2*(4 + (4*I)*a*x + a*x*Sin[2*ArcTan[
a*x]]))/(c^2*x)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan\left(ax\right)^2}{a^4c^2x^6 + 2\,a^2c^2x^4 + c^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.12, size = 369, normalized size = 2.08

$$-\frac{\arctan(ax)^2}{c^2x}-\frac{a^2x\arctan(ax)^2}{2c^2\left(a^2x^2+1\right)}-\frac{a\arctan(ax)^3}{2c^2}+\frac{2a\arctan(ax)\ln(ax)}{c^2}-\frac{a\arctan(ax)\ln\left(a^2x^2+1\right)}{c^2}-\frac{a\,\mathrm{arcta}}{2c^2\left(a^2x\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^2,x)
```

```
[Out] -arctan(a*x)^2/c^2/x-1/2*a^2*x*arctan(a*x)^2/c^2/(a^2*x^2+1)-1/2*a*arctan(a
*x)^3/c^2+2*a/c^2*arctan(a*x)*ln(a*x)-a/c^2*arctan(a*x)*ln(a^2*x^2+1)-1/2*a
*arctan(a*x)/c^2/(a^2*x^2+1)+1/4*a^2*x/c^2/(a^2*x^2+1)+1/4*a*arctan(a*x)/c^
2+I*a/c^2*ln(a*x)*ln(1+I*a*x)+1/4*I*a/c^2*ln(a*x-I)^2-1/4*I*a/c^2*ln(I+a*x)
^2-I*a/c^2*ln(a*x)*ln(1-I*a*x)+1/2*I*a/c^2*dilog(-1/2*I*(I+a*x))-1/2*I*a/c^
2*dilog(1/2*I*(a*x-I))-I*a/c^2*dilog(1-I*a*x)+1/2*I*a/c^2*ln(I+a*x)*ln(a^2*
x^2+1)+1/2*I*a/c^2*ln(a*x-I)*ln(-1/2*I*(I+a*x))+I*a/c^2*dilog(1+I*a*x)-1/2*
I*a/c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))-1/2*I*a/c^2*ln(a*x-I)*ln(a^2*x^2+1)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x^2\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\mathrm{atan}^2(ax)}{a^4x^6+2a^2x^4+x^2}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**2/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**2/(a**4*x**6 + 2*a**2*x**4 + x**2), x)/c**2
```

3.297 $\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=250

$$-\frac{a^2\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{c^2}+\frac{2ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c^2}+\frac{a^2}{4c^2\left(a^2x^2+1\right)}-\frac{a^2\log\left(a^2x^2+1\right)}{2c^2}-\frac{a^2\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}+\frac{a^2\log(x)}{c^2}+$$

```
[Out] 1/4*a^2/c^2/(a^2*x^2+1)-a*arctan(a*x)/c^2/x+1/2*a^3*x*arctan(a*x)/c^2/(a^2*
x^2+1)-1/4*a^2*arctan(a*x)^2/c^2-1/2*arctan(a*x)^2/c^2/x^2-1/2*a^2*arctan(a
*x)^2/c^2/(a^2*x^2+1)+2/3*I*a^2*arctan(a*x)^3/c^2+a^2*ln(x)/c^2-1/2*a^2*ln(
a^2*x^2+1)/c^2-2*a^2*arctan(a*x)^2*ln(2-2/(1-I*a*x))/c^2+2*I*a^2*arctan(a*x
)*polylog(2,-1+2/(1-I*a*x))/c^2-a^2*polylog(3,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.74, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 15, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.682, Rules used = {4966, 4918, 4852, 266, 36, 29, 31, 4884, 4924, 4868, 4992, 6610, 4930, 4892, 261}

$$-\frac{a^2\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{c^2}+\frac{2ia^2\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^2}+\frac{a^2}{4c^2\left(a^2x^2+1\right)}-\frac{a^2\log\left(a^2x^2+1\right)}{2c^2}+\frac{a^3x\tan}{2c^2\left(a^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)^2),x]
```

```
[Out] a^2/(4*c^2*(1 + a^2*x^2)) - (a*ArcTan[a*x])/(c^2*x) + (a^3*x*ArcTan[a*x])/(
2*c^2*(1 + a^2*x^2)) - (a^2*ArcTan[a*x]^2)/(4*c^2) - ArcTan[a*x]^2/(2*c^2*x
^2) - (a^2*ArcTan[a*x]^2)/(2*c^2*(1 + a^2*x^2)) + (((2*I)/3)*a^2*ArcTan[a*x
]^3)/c^2 + (a^2*Log[x])/c^2 - (a^2*Log[1 + a^2*x^2])/(2*c^2) - (2*a^2*ArcTa
n[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c^2 + ((2*I)*a^2*ArcTan[a*x]*PolyLog[2, -1
 + 2/(1 - I*a*x)])/c^2 - (a^2*PolyLog[3, -1 + 2/(1 - I*a*x)])/c^2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
```

```
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= a^4\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^3}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^2}{2c^2x^2} - \frac{a^2\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} + a^3\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx + \frac{a\int \frac{\tan^{-1}(ax)}{x^2\left(1+a^2x^2\right)}\,dx}{c^2} - 2\left(-\frac{ia^2\tan^{-1}}{3c^2}\right.$$

$$= \frac{a^3x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{a^2\tan^{-1}(ax)^2}{4c^2} - \frac{\tan^{-1}(ax)^2}{2c^2x^2} - \frac{a^2\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} - \frac{1}{2}a^4\int \frac{x}{\left(c+a^2cx^2\right)^2}\,dx$$

$$= \frac{a^2}{4c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^2x} + \frac{a^3x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)^2}{4c^2} - \frac{\tan^{-1}(ax)^2}{2c^2x^2} - \frac{a^2\tan^{-1}(}{2c^2\left(1+\right.}$$

$$= \frac{a^2}{4c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^2x} + \frac{a^3x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)^2}{4c^2} - \frac{\tan^{-1}(ax)^2}{2c^2x^2} - \frac{a^2\tan^{-1}(}{2c^2\left(1+\right.}$$

$$= \frac{a^2}{4c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^2x} + \frac{a^3x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)^2}{4c^2} - \frac{\tan^{-1}(ax)^2}{2c^2x^2} - \frac{a^2\tan^{-1}(}{2c^2\left(1+\right.}$$

$$= \frac{a^2}{4c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^2x} + \frac{a^3x\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)^2}{4c^2} - \frac{\tan^{-1}(ax)^2}{2c^2x^2} - \frac{a^2\tan^{-1}(}{2c^2\left(1+\right.}$$

Mathematica [A] time = 0.67, size = 183, normalized size = 0.73

$$a^2\left(\log\left(\frac{ax}{\sqrt{a^2x^2+1}}\right) - \frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{2a^2x^2} - 2i\tan^{-1}(ax)\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) - \text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) - \frac{2}{3}i\tan^{-1}(ax)^3 - \frac{\tan^{-1}(ax}{ax}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)^2),x]
```

```
[Out] (a^2*((I/12)*Pi^3 - ArcTan[a*x]/(a*x) - ((1 + a^2*x^2)*ArcTan[a*x]^2)/(2*a^
2*x^2) - ((2*I)/3)*ArcTan[a*x]^3 + Cos[2*ArcTan[a*x]]/8 - (ArcTan[a*x]^2*Co
s[2*ArcTan[a*x]])/4 - 2*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + Log
[(a*x)/Sqrt[1 + a^2*x^2]] - (2*I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a
*x])] - PolyLog[3, E^((-2*I)*ArcTan[a*x])] + (ArcTan[a*x]*Sin[2*ArcTan[a*x]
])/4))/c^2
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{a^4c^2x^7 + 2\,a^2c^2x^5 + c^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 7.52, size = 5115, normalized size = 20.46

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^2,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{\left(a^2cx^2 + c\right)^2 x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^2*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)^2}{x^3\,\left(c\,a^2\,x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^2), x)
```

<u>**sympy**</u> **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^2(ax)}{a^4x^7+2a^2x^5+x^3}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**3/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**2/(a**4*x**7 + 2*a**2*x**5 + x**3), x)/c**2
```

3.298 $\int \frac{\tan^{-1}(ax)^2}{x^4(c+a^2cx^2)^2} dx$

Optimal. Leaf size=242

$$\frac{7ia^3\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{3c^2}+\frac{5a^3\tan^{-1}(ax)^3}{6c^2}+\frac{7ia^3\tan^{-1}(ax)^2}{3c^2}-\frac{7a^3\tan^{-1}(ax)}{12c^2}-\frac{14a^3\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{3c^2}-\frac{a^2}{3c^2x}+$$

```
[Out] -1/3*a^2/c^2/x-1/4*a^4*x/c^2/(a^2*x^2+1)-7/12*a^3*arctan(a*x)/c^2-1/3*a*arc
tan(a*x)/c^2/x^2+1/2*a^3*arctan(a*x)/c^2/(a^2*x^2+1)+7/3*I*a^3*arctan(a*x)^
2/c^2-1/3*arctan(a*x)^2/c^2/x^3+2*a^2*arctan(a*x)^2/c^2/x+1/2*a^4*x*arctan(
a*x)^2/c^2/(a^2*x^2+1)+5/6*a^3*arctan(a*x)^3/c^2-14/3*a^3*arctan(a*x)*ln(2-
2/(1-I*a*x))/c^2+7/3*I*a^3*polylog(2,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.87, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 13, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.591, Rules used = {4966, 4918, 4852, 325, 203, 4924, 4868, 2447, 4884, 4892, 4930, 199, 205}

$$\frac{7ia^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{3c^2}-\frac{a^4x}{4c^2\left(a^2x^2+1\right)}+\frac{a^4x\tan^{-1}(ax)^2}{2c^2\left(a^2x^2+1\right)}+\frac{a^3\tan^{-1}(ax)}{2c^2\left(a^2x^2+1\right)}-\frac{a^2}{3c^2x}+\frac{5a^3\tan^{-1}(ax)^3}{6c^2}+$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)^2),x]
```

```
[Out] -a^2/(3*c^2*x) - (a^4*x)/(4*c^2*(1 + a^2*x^2)) - (7*a^3*ArcTan[a*x])/(12*c^
2) - (a*ArcTan[a*x])/(3*c^2*x^2) + (a^3*ArcTan[a*x])/(2*c^2*(1 + a^2*x^2))
+ (((7*I)/3)*a^3*ArcTan[a*x]^2)/c^2 - ArcTan[a*x]^2/(3*c^2*x^3) + (2*a^2*Ar
cTan[a*x]^2)/(c^2*x) + (a^4*x*ArcTan[a*x]^2)/(2*c^2*(1 + a^2*x^2)) + (5*a^3
*ArcTan[a*x]^3)/(6*c^2) - (14*a^3*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/(3*c^
2) + (((7*I)/3)*a^3*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^2
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
```

```
x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= a^4\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^4}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^2}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^3}{6c^2} - a^5\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx + \frac{(2a)\int \frac{\tan^{-1}}{x^3(1+}}{3c^2}$$

$$= \frac{a^3\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^2}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)^2}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^3}{6c^2} - \frac{1}{2}a^4\int \frac{1}{\left(c+a^2cx^2\right)^2}$$

$$= -\frac{a^4x}{4c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{3c^2x^2} + \frac{a^3\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{ia^3\tan^{-1}(ax)^2}{3c^2} - \frac{\tan^{-1}(ax)^2}{3c^2x^3} + \frac{a^4x}{2c^2}$$

$$= -\frac{a^2}{3c^2x} - \frac{a^4x}{4c^2\left(1+a^2x^2\right)} - \frac{a^3\tan^{-1}(ax)}{4c^2} - \frac{a\tan^{-1}(ax)}{3c^2x^2} + \frac{a^3\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{ia^3\tan^{-1}(ax}{3c^2}$$

$$= -\frac{a^2}{3c^2x} - \frac{a^4x}{4c^2\left(1+a^2x^2\right)} - \frac{7a^3\tan^{-1}(ax)}{12c^2} - \frac{a\tan^{-1}(ax)}{3c^2x^2} + \frac{a^3\tan^{-1}(ax)}{2c^2\left(1+a^2x^2\right)} + \frac{ia^3\tan^{-1}(}{3c^2}$$

Mathematica [A] time = 0.45, size = 166, normalized size = 0.69

$$56ia^3x^3\text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right) + 20a^3x^3\tan^{-1}(ax)^3 - a^2x^2\left(3ax\sin\left(2\tan^{-1}(ax)\right)+8\right) + 2ax\tan^{-1}(ax)\left(-4a^2x^2 - 56\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)^2),x]
```

```
[Out] (20*a^3*x^3*ArcTan[a*x]^3 + 2*a*x*ArcTan[a*x]*(-4 - 4*a^2*x^2 + 3*a^2*x^2*C
os[2*ArcTan[a*x]] - 56*a^2*x^2*Log[1 - E^((2*I)*ArcTan[a*x])]) + (56*I)*a^3
*x^3*PolyLog[2, E^((2*I)*ArcTan[a*x])] - a^2*x^2*(8 + 3*a*x*Sin[2*ArcTan[a*
x]]) + ArcTan[a*x]^2*(-8 + 48*a^2*x^2 + (56*I)*a^3*x^3 + 6*a^3*x^3*Sin[2*Ar
cTan[a*x]]))/(24*c^2*x^3)
```

fricas [F] time = 1.05, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{a^4c^2x^8 + 2\,a^2c^2x^6 + c^2x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^4*c^2*x^8 + 2*a^2*c^2*x^6 + c^2*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.17, size = 444, normalized size = 1.83

$$-\frac{\arctan(ax)^2}{3c^2x^3}+\frac{2a^2\arctan(ax)^2}{c^2x}+\frac{a^4x\arctan(ax)^2}{2c^2\left(a^2x^2+1\right)}+\frac{5a^3\arctan(ax)^3}{6c^2}-\frac{a\arctan(ax)}{3c^2x^2}-\frac{14a^3\arctan(ax)\ln(ax)}{3c^2}+\frac{7}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/3*arctan(a*x)^2/c^2/x^3+2*a^2*arctan(a*x)^2/c^2/x+1/2*a^4*x*arctan(a*x)^
2/c^2/(a^2*x^2+1)+5/6*a^3*arctan(a*x)^3/c^2-1/3*a*arctan(a*x)/c^2/x^2-14/3*
a^3/c^2*arctan(a*x)*ln(a*x)+7/3*a^3/c^2*arctan(a*x)*ln(a^2*x^2+1)+1/2*a^3*a
rctan(a*x)/c^2/(a^2*x^2+1)-7/12*I*a^3/c^2*ln(a*x-I)^2+7/3*I*a^3/c^2*dilog(1
-I*a*x)-7/3*I*a^3/c^2*dilog(1+I*a*x)+7/6*I*a^3/c^2*ln(a*x-I)*ln(a^2*x^2+1)+
7/12*I*a^3/c^2*ln(I+a*x)^2-7/6*I*a^3/c^2*dilog(-1/2*I*(I+a*x))+7/6*I*a^3/c^
2*dilog(1/2*I*(a*x-I))+7/3*I*a^3/c^2*ln(a*x)*ln(1-I*a*x)-7/3*I*a^3/c^2*ln(a
*x)*ln(1+I*a*x)+7/6*I*a^3/c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))-7/6*I*a^3/c^2*ln(
a*x-I)*ln(-1/2*I*(I+a*x))-7/6*I*a^3/c^2*ln(I+a*x)*ln(a^2*x^2+1)-1/3*a^2/c^2
/x-1/4*a^4*x/c^2/(a^2*x^2+1)-7/12*a^3*arctan(a*x)/c^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x^4\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{2}{\left(a x \right)}}{a^{4} x^{8} + 2 a^{2} x^{6} + x^{4}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**4/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**2/(a**4*x**8 + 2*a**2*x**6 + x**4), x)/c**2
```

3.299 $\int \frac{x^3 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=140

$$-\frac{3\tan^{-1}(ax)^2}{32a^4c^3}-\frac{x^4}{32c^3\left(a^2x^2+1\right)^2}+\frac{x^4\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}+\frac{x^3\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)^2}+\frac{3}{32a^4c^3\left(a^2x^2+1\right)}+\frac{3x\tan^{-1}(ax)}{16a^3c^3\left(a^2x^2+1\right)}$$

```
[Out] -1/32*x^4/c^3/(a^2*x^2+1)^2+3/32/a^4/c^3/(a^2*x^2+1)+1/8*x^3*arctan(a*x)/a/
c^3/(a^2*x^2+1)^2+3/16*x*arctan(a*x)/a^3/c^3/(a^2*x^2+1)-3/32*arctan(a*x)^2
/a^4/c^3+1/4*x^4*arctan(a*x)^2/c^3/(a^2*x^2+1)^2
```

Rubi [A] time = 0.19, antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4944, 4938, 4934, 4884}

$$-\frac{x^4}{32c^3\left(a^2x^2+1\right)^2}+\frac{3}{32a^4c^3\left(a^2x^2+1\right)}+\frac{x^4\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}+\frac{x^3\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)}{16a^3c^3\left(a^2x^2+1\right)}-\frac{3\tan^{-1}(ax)^2}{32a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] -x^4/(32*c^3*(1 + a^2*x^2)^2) + 3/(32*a^4*c^3*(1 + a^2*x^2)) + (x^3*ArcTan[
a*x])/(8*a*c^3*(1 + a^2*x^2)^2) + (3*x*ArcTan[a*x])/(16*a^3*c^3*(1 + a^2*x^
2)) - (3*ArcTan[a*x]^2)/(32*a^4*c^3) + (x^4*ArcTan[a*x]^2)/(4*c^3*(1 + a^2*
x^2)^2)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4934

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^2*((d_) + (e_.)*(x_)^2)^(q_), x
_Symbol] :> -Simp[(b*(d + e*x^2)^(q + 1))/(4*c^3*d*(q + 1)^2), x] + (-Dist[
1/(2*c^2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] +
Simp[(x*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*c^2*d*(q + 1)), x]) /;
FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -5/2]
```

Rule 4938

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(q_), x_Symbol] :> Simp[(b*(f*x)^m*(d + e*x^2)^(q + 1))/(c*d*m^2), x] +
 (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x)^(m - 2)*(d + e*x^2)^(q + 1)*(a +
b*ArcTan[c*x]), x], x] - Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*A
rcTan[c*x]))/(c^2*d*m), x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d
] && EqQ[m + 2*q + 2, 0] && LtQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
```

```
& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx = \frac{x^4 \tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} - \frac{1}{2}a\int \frac{x^4 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx$$

$$= -\frac{x^4}{32c^3\left(1+a^2x^2\right)^2} + \frac{x^3\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2} + \frac{x^4\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} - \frac{3\int \frac{x^2\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{8ac}$$

$$= -\frac{x^4}{32c^3\left(1+a^2x^2\right)^2} + \frac{3}{32a^4c^3\left(1+a^2x^2\right)} + \frac{x^3\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)}{16a^3c^3\left(1+a^2x^2\right)} + \frac{x^4 \text{ta}}{4c^3(}$$

$$= -\frac{x^4}{32c^3\left(1+a^2x^2\right)^2} + \frac{3}{32a^4c^3\left(1+a^2x^2\right)} + \frac{x^3\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)}{16a^3c^3\left(1+a^2x^2\right)} - \frac{3\tan}{32}$$

Mathematica [A] time = 0.09, size = 74, normalized size = 0.53

$$\frac{5a^2x^2+2ax\left(5a^2x^2+3\right)\tan^{-1}(ax)+\left(5a^4x^4-6a^2x^2-3\right)\tan^{-1}(ax)^2+4}{32a^4c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (4 + 5*a^2*x^2 + 2*a*x*(3 + 5*a^2*x^2)*ArcTan[a*x] + (-3 - 6*a^2*x^2 + 5*a^
4*x^4)*ArcTan[a*x]^2)/(32*a^4*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.65, size = 87, normalized size = 0.62

$$\frac{5\,a^2x^2+\left(5\,a^4x^4-6\,a^2x^2-3\right)\arctan(ax)^2+2\left(5\,a^3x^3+3\,ax\right)\arctan(ax)+4}{32\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/32*(5*a^2*x^2 + (5*a^4*x^4 - 6*a^2*x^2 - 3)*arctan(a*x)^2 + 2*(5*a^3*x^3
+ 3*a*x)*arctan(a*x) + 4)/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.07, size = 154, normalized size = 1.10

$$\frac{\arctan(ax)^2}{4a^4c^3\left(a^2x^2+1\right)^2}-\frac{\arctan(ax)^2}{2a^4c^3\left(a^2x^2+1\right)}+\frac{5x^3\arctan(ax)}{16a\,c^3\left(a^2x^2+1\right)^2}+\frac{3\arctan(ax)\,x}{16a^3c^3\left(a^2x^2+1\right)^2}+\frac{5\arctan(ax)^2}{32a^4c^3}-\frac{1}{32a^4c^3\left(a^2x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/4/a^4/c^3*arctan(a*x)^2/(a^2*x^2+1)^2-1/2/a^4/c^3*arctan(a*x)^2/(a^2*x^2+
1)+5/16*x^3*arctan(a*x)/a/c^3/(a^2*x^2+1)^2+3/16/a^3/c^3*arctan(a*x)*x/(a^2
*x^2+1)^2+5/32*arctan(a*x)^2/a^4/c^3-1/32/a^4/c^3/(a^2*x^2+1)^2+5/32/a^4/c^
3/(a^2*x^2+1)
```

maxima [A] time = 0.43, size = 185, normalized size = 1.32

$$\frac{1}{16}\,a\left(\frac{5\,a^2x^3+3\,x}{a^8c^3x^4+2\,a^6c^3x^2+a^4c^3}+\frac{5\,\arctan\left(ax\right)}{a^5c^3}\right)\arctan\left(ax\right)+\frac{\left(5\,a^2x^2-5\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^2+4\right)a^2}{32\left(a^{10}c^3x^4+2\,a^8c^3x^2+a^6c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/16*a*((5*a^2*x^3 + 3*x)/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3) + 5*arcta
n(a*x)/(a^5*c^3))*arctan(a*x) + 1/32*(5*a^2*x^2 - 5*(a^4*x^4 + 2*a^2*x^2 +
1)*arctan(a*x)^2 + 4)*a^2/(a^10*c^3*x^4 + 2*a^8*c^3*x^2 + a^6*c^3) - 1/4*(2
*a^2*x^2 + 1)*arctan(a*x)^2/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

mupad [B] time = 0.57, size = 85, normalized size = 0.61

$$\frac{5\,a^4\,x^4\,\mathrm{atan}\left(a\,x\right)^2+10\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right)-6\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)^2+5\,a^2\,x^2+6\,a\,x\,\mathrm{atan}\left(a\,x\right)-3\,\mathrm{atan}\left(a\,x\right)^2+4}{32\,a^4\,c^3\,{\left(a^2\,x^2+1\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^3,x)
```

```
[Out] (5*a^2*x^2 - 3*atan(a*x)^2 + 10*a^3*x^3*atan(a*x) + 6*a*x*atan(a*x) - 6*a^2
*x^2*atan(a*x)^2 + 5*a^4*x^4*atan(a*x)^2 + 4)/(32*a^4*c^3*(a^2*x^2 + 1)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3\,\mathrm{atan}^2\left(ax\right)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**2/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**3*atan(a*x)**2/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/
c**3
```

3.300 $\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=181

$$\frac{\tan^{-1}(ax)^3}{24a^3c^3}-\frac{\tan^{-1}(ax)}{64a^3c^3}-\frac{x}{64a^2c^3\left(a^2x^2+1\right)}+\frac{x}{32a^2c^3\left(a^2x^2+1\right)^2}+\frac{x\tan^{-1}(ax)^2}{8a^2c^3\left(a^2x^2+1\right)}-\frac{x\tan^{-1}(ax)^2}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}}{8a^3c^3(}$$

```
[Out] 1/32*x/a^2/c^3/(a^2*x^2+1)^2-1/64*x/a^2/c^3/(a^2*x^2+1)-1/64*arctan(a*x)/a^
3/c^3-1/8*arctan(a*x)/a^3/c^3/(a^2*x^2+1)^2+1/8*arctan(a*x)/a^3/c^3/(a^2*x^
2+1)-1/4*x*arctan(a*x)^2/a^2/c^3/(a^2*x^2+1)^2+1/8*x*arctan(a*x)^2/a^2/c^3/
(a^2*x^2+1)+1/24*arctan(a*x)^3/a^3/c^3
```

Rubi [A] time = 0.27, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4964, 4892, 4930, 199, 205, 4900}

$$-\frac{x}{64a^2c^3\left(a^2x^2+1\right)}+\frac{x}{32a^2c^3\left(a^2x^2+1\right)^2}+\frac{x\tan^{-1}(ax)^2}{8a^2c^3\left(a^2x^2+1\right)}-\frac{x\tan^{-1}(ax)^2}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(ax)}{8a^3c^3\left(a^2x^2+1\right)}-\frac{\tan^{-1}(a}{8a^3c^3\left(a^2x^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] x/(32*a^2*c^3*(1 + a^2*x^2)^2) - x/(64*a^2*c^3*(1 + a^2*x^2)) - ArcTan[a*x]
/(64*a^3*c^3) - ArcTan[a*x]/(8*a^3*c^3*(1 + a^2*x^2)^2) + ArcTan[a*x]/(8*a^
3*c^3*(1 + a^2*x^2)) - (x*ArcTan[a*x]^2)/(4*a^2*c^3*(1 + a^2*x^2)^2) + (x*A
rcTan[a*x]^2)/(8*a^2*c^3*(1 + a^2*x^2)) + ArcTan[a*x]^3/(24*a^3*c^3)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
```

```
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx}{a^2} + \frac{\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx}{a^2c}$$

$$= -\frac{\tan^{-1}(ax)}{8a^3c^3\left(1+a^2x^2\right)^2} - \frac{x\tan^{-1}(ax)^2}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)^2}{2a^2c^3\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{6a^3c^3} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx}{8a^2}$$

$$= \frac{x}{32a^2c^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)}{8a^3c^3\left(1+a^2x^2\right)^2} + \frac{\tan^{-1}(ax)}{2a^3c^3\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^2}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{x\tan}{8a^2c^3(1}$$

$$= \frac{x}{32a^2c^3\left(1+a^2x^2\right)^2} - \frac{13x}{64a^2c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{8a^3c^3\left(1+a^2x^2\right)^2} + \frac{\tan^{-1}(ax)}{8a^3c^3\left(1+a^2x^2\right)} - \frac{x\tan}{4a^2c^3(1}$$

$$= \frac{x}{32a^2c^3\left(1+a^2x^2\right)^2} - \frac{x}{64a^2c^3\left(1+a^2x^2\right)} - \frac{13\tan^{-1}(ax)}{64a^3c^3} - \frac{\tan^{-1}(ax)}{8a^3c^3\left(1+a^2x^2\right)^2} + \frac{\tan^{-1}(a}{8a^3c^3(1+a}$$

$$= \frac{x}{32a^2c^3\left(1+a^2x^2\right)^2} - \frac{x}{64a^2c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)}{64a^3c^3} - \frac{\tan^{-1}(ax)}{8a^3c^3\left(1+a^2x^2\right)^2} + \frac{\tan^{-1}(ax)}{8a^3c^3(1+a^2x}$$

Mathematica [A] time = 0.12, size = 95, normalized size = 0.52

$$\frac{-3a^3x^3+24ax\left(a^2x^2-1\right)\tan^{-1}(ax)^2+8\left(a^2x^2+1\right)^2\tan^{-1}(ax)^3-3\left(a^4x^4-6a^2x^2+1\right)\tan^{-1}(ax)+3ax}{192a^3c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (3*a*x - 3*a^3*x^3 - 3*(1 - 6*a^2*x^2 + a^4*x^4)*ArcTan[a*x] + 24*a*x*(-1 +
 a^2*x^2)*ArcTan[a*x]^2 + 8*(1 + a^2*x^2)^2*ArcTan[a*x]^3)/(192*a^3*c^3*(1
+ a^2*x^2)^2)
```

fricas [A] time = 0.72, size = 114, normalized size = 0.63

$$-\frac{3\,a^{3}x^{3}-8\left(a^{4}x^{4}+2\,a^{2}x^{2}+1\right)\arctan\left(ax\right)^{3}-24\left(a^{3}x^{3}-ax\right)\arctan\left(ax\right)^{2}-3\,ax+3\left(a^{4}x^{4}-6\,a^{2}x^{2}+1\right)\mathrm{arcta}}{192\left(a^{7}c^{3}x^{4}+2\,a^{5}c^{3}x^{2}+a^{3}c^{3}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] -1/192*(3*a^3*x^3 - 8*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^3 - 24*(a^3*x^3
 - a*x)*arctan(a*x)^2 - 3*a*x + 3*(a^4*x^4 - 6*a^2*x^2 + 1)*arctan(a*x))/(a
^7*c^3*x^4 + 2*a^5*c^3*x^2 + a^3*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 164, normalized size = 0.91

$$\frac{\arctan\left(ax\right)^{2}x^{3}}{8c^{3}\left(a^{2}x^{2}+1\right)^{2}}-\frac{x\arctan\left(ax\right)^{2}}{8a^{2}c^{3}\left(a^{2}x^{2}+1\right)^{2}}+\frac{\arctan\left(ax\right)^{3}}{24a^{3}c^{3}}-\frac{\arctan\left(ax\right)}{8a^{3}c^{3}\left(a^{2}x^{2}+1\right)^{2}}+\frac{\arctan\left(ax\right)}{8a^{3}c^{3}\left(a^{2}x^{2}+1\right)}-\frac{x^{3}}{64c^{3}\left(a^{2}x^{2}+1\right)^{2}}+\frac{}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/8/c^3*arctan(a*x)^2/(a^2*x^2+1)^2*x^3-1/8*x*arctan(a*x)^2/a^2/c^3/(a^2*x^
2+1)^2+1/24*arctan(a*x)^3/a^3/c^3-1/8*arctan(a*x)/a^3/c^3/(a^2*x^2+1)^2+1/8
*arctan(a*x)/a^3/c^3/(a^2*x^2+1)-1/64/c^3/(a^2*x^2+1)^2*x^3+1/64*x/a^2/c^3/
(a^2*x^2+1)^2-1/64*arctan(a*x)/a^3/c^3
```

maxima [A] time = 0.47, size = 232, normalized size = 1.28

$$\frac{1}{8}\left(\frac{a^{2}x^{3}-x}{a^{6}c^{3}x^{4}+2\,a^{4}c^{3}x^{2}+a^{2}c^{3}}+\frac{\arctan\left(ax\right)}{a^{3}c^{3}}\right)\arctan\left(ax\right)^{2}-\frac{\left(3\,a^{3}x^{3}-8\left(a^{4}x^{4}+2\,a^{2}x^{2}+1\right)\arctan\left(ax\right)^{3}-3\,ax-\right.}{192\left(a^{9}c^{3}x^{4}+2\,a^{7}c^{3}x^{2}\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((a^2*x^3 - x)/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3) + arctan(a*x)/(a
^3*c^3))*arctan(a*x)^2 - 1/192*(3*a^3*x^3 - 8*(a^4*x^4 + 2*a^2*x^2 + 1)*arc
tan(a*x)^3 - 3*a*x + 3*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x))*a^2/(a^9*c^3*
x^4 + 2*a^7*c^3*x^2 + a^5*c^3) + 1/8*(a^2*x^2 - (a^4*x^4 + 2*a^2*x^2 + 1)*a
rctan(a*x)^2)*a*arctan(a*x)/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

mupad [B] time = 0.49, size = 150, normalized size = 0.83

$$\frac{\frac{x}{8\,a^{2}}-\frac{x^{3}}{8}}{8\,a^{4}\,c^{3}\,x^{4}+16\,a^{2}\,c^{3}\,x^{2}+8\,c^{3}}-\frac{\mathrm{atan}\left(a\,x\right)^{2}\left(\frac{x}{8\,a^{4}\,c^{3}}-\frac{x^{3}}{8\,a^{2}\,c^{3}}\right)}{\frac{1}{a^{2}}+2\,x^{2}+a^{2}\,x^{4}}-\frac{\mathrm{atan}\left(a\,x\right)}{64\,a^{3}\,c^{3}}+\frac{\mathrm{atan}\left(a\,x\right)^{3}}{24\,a^{3}\,c^{3}}+\frac{x^{2}\,\mathrm{atan}\left(a\,x\right)}{8\,a^{3}\,c^{3}\left(\frac{1}{a^{2}}+2\,x^{2}+a^{2}\,x^{4}\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^3,x)
```

```
[Out] (x/(8*a^2) - x^3/8)/(8*c^3 + 16*a^2*c^3*x^2 + 8*a^4*c^3*x^4) - (atan(a*x)^2
*(x/(8*a^4*c^3) - x^3/(8*a^2*c^3)))/(1/a^2 + 2*x^2 + a^2*x^4) - atan(a*x)/(
64*a^3*c^3) + atan(a*x)^3/(24*a^3*c^3) + (x^2*atan(a*x))/(8*a^3*c^3*(1/a^2
+ 2*x^2 + a^2*x^4))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2 \operatorname{atan}^2(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**2/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**2*atan(a*x)**2/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/
c**3
```

3.301 $\int \frac{x \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=138

$$\frac{3}{32a^2c^3\left(a^2x^2+1\right)}+\frac{1}{32a^2c^3\left(a^2x^2+1\right)^2}-\frac{\tan^{-1}(ax)^2}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)}{16ac^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)^2}{32a^2c^3}$$

```
[Out] 1/32/a^2/c^3/(a^2*x^2+1)^2+3/32/a^2/c^3/(a^2*x^2+1)+1/8*x*arctan(a*x)/a/c^3
/(a^2*x^2+1)^2+3/16*x*arctan(a*x)/a/c^3/(a^2*x^2+1)+3/32*arctan(a*x)^2/a^2/
c^3-1/4*arctan(a*x)^2/a^2/c^3/(a^2*x^2+1)^2
```

Rubi [A] time = 0.10, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4930, 4896, 4892, 261}

$$\frac{3}{32a^2c^3\left(a^2x^2+1\right)}+\frac{1}{32a^2c^3\left(a^2x^2+1\right)^2}-\frac{\tan^{-1}(ax)^2}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)}{16ac^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)^2}{32a^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] 1/(32*a^2*c^3*(1 + a^2*x^2)^2) + 3/(32*a^2*c^3*(1 + a^2*x^2)) + (x*ArcTan[a
*x])/(8*a*c^3*(1 + a^2*x^2)^2) + (3*x*ArcTan[a*x])/(16*a*c^3*(1 + a^2*x^2))
 + (3*ArcTan[a*x]^2)/(32*a^2*c^3) - ArcTan[a*x]^2/(4*a^2*c^3*(1 + a^2*x^2)^
2)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\tan^{-1}(ax)^2}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx}{2a}$$

$$= \frac{1}{32a^2c^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)^2}{4a^2c^3\left(1+a^2x^2\right)^2} + \frac{3\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx}{8ac}$$

$$= \frac{1}{32a^2c^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)}{16ac^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^2}{32a^2c^3} - \frac{\tan^{-1}(ax)^2}{4a^2c^3\left(1+a^2x^2\right.}$$

$$= \frac{1}{32a^2c^3\left(1+a^2x^2\right)^2} + \frac{3}{32a^2c^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)}{16ac^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(a}{32a^2c^3}$$

Mathematica [A] time = 0.04, size = 71, normalized size = 0.51

$$\frac{3a^2x^2 + 2ax\left(3a^2x^2+5\right)\tan^{-1}(ax) + \left(3a^4x^4+6a^2x^2-5\right)\tan^{-1}(ax)^2 + 4}{32c^3\left(a^3x^2+a\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (4 + 3*a^2*x^2 + 2*a*x*(5 + 3*a^2*x^2)*ArcTan[a*x] + (-5 + 6*a^2*x^2 + 3*a^
4*x^4)*ArcTan[a*x]^2)/(32*c^3*(a + a^3*x^2)^2)
```

fricas [A] time = 0.67, size = 87, normalized size = 0.63

$$\frac{3\,a^2x^2 + \left(3\,a^4x^4 + 6\,a^2x^2 - 5\right)\arctan\left(ax\right)^2 + 2\left(3\,a^3x^3 + 5\,ax\right)\arctan\left(ax\right) + 4}{32\left(a^6c^3x^4 + 2\,a^4c^3x^2 + a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/32*(3*a^2*x^2 + (3*a^4*x^4 + 6*a^2*x^2 - 5)*arctan(a*x)^2 + 2*(3*a^3*x^3
+ 5*a*x)*arctan(a*x) + 4)/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 127, normalized size = 0.92

$$\frac{1}{32a^2c^3\left(a^2x^2+1\right)^2} + \frac{3}{32a^2c^3\left(a^2x^2+1\right)} + \frac{x\arctan\left(ax\right)}{8a\,c^3\left(a^2x^2+1\right)^2} + \frac{3x\arctan\left(ax\right)}{16a\,c^3\left(a^2x^2+1\right)} + \frac{3\arctan\left(ax\right)^2}{32a^2c^3} - \frac{\arctan\left(ax\right)^2}{4a^2c^3\left(a^2x^2+1\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^2/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/32/a^2/c^3/(a^2*x^2+1)^2+3/32/a^2/c^3/(a^2*x^2+1)+1/8*x*arctan(a*x)/a/c^3
/(a^2*x^2+1)^2+3/16*x*arctan(a*x)/a/c^3/(a^2*x^2+1)+3/32*arctan(a*x)^2/a^2/
c^3-1/4*arctan(a*x)^2/a^2/c^3/(a^2*x^2+1)^2
```

maxima [A] time = 0.43, size = 163, normalized size = 1.18

$$\frac{\left(\frac{3\,a^{2}x^{3}+5\,x}{a^{4}c^{2}x^{4}+2\,a^{2}c^{2}x^{2}+c^{2}}+\frac{3\,\arctan(ax)}{ac^{2}}\right)\arctan\left(ax\right)}{16\,ac}+\frac{3\,a^{2}x^{2}-3\left(a^{4}x^{4}+2\,a^{2}x^{2}+1\right)\arctan\left(ax\right)^{2}+4}{32\left(a^{6}c^{2}x^{4}+2\,a^{4}c^{2}x^{2}+a^{2}c^{2}\right)c}-\frac{\arctan\left(ax\right)^{2}}{4\left(a^{2}cx^{2}+c\right)^{2}a^{2}c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/16*((3*a^2*x^3 + 5*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2) + 3*arctan(a*x)
/(a*c^2))*arctan(a*x)/(a*c) + 1/32*(3*a^2*x^2 - 3*(a^4*x^4 + 2*a^2*x^2 + 1)
*arctan(a*x)^2 + 4)/((a^6*c^2*x^4 + 2*a^4*c^2*x^2 + a^2*c^2)*c) - 1/4*arcta
n(a*x)^2/((a^2*c*x^2 + c)^2*a^2*c)
```

mupad [B] time = 0.51, size = 85, normalized size = 0.62

$$\frac{3\,a^4\,x^4\,\mathrm{atan}\left(a\,x\right)^2+6\,a^3\,x^3\,\mathrm{atan}\left(a\,x\right)+6\,a^2\,x^2\,\mathrm{atan}\left(a\,x\right)^2+3\,a^2\,x^2+10\,a\,x\,\mathrm{atan}\left(a\,x\right)-5\,\mathrm{atan}\left(a\,x\right)^2+4}{32\,a^2\,c^3\,{\left(a^2\,x^2+1\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^3,x)
```

```
[Out] (3*a^2*x^2 - 5*atan(a*x)^2 + 6*a^3*x^3*atan(a*x) + 10*a*x*atan(a*x) + 6*a^2
*x^2*atan(a*x)^2 + 3*a^4*x^4*atan(a*x)^2 + 4)/(32*a^2*c^3*(a^2*x^2 + 1)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x\,\mathrm{atan}^{2}\left(ax\right)}{a^{6}x^{6}+3a^{4}x^{4}+3a^{2}x^{2}+1}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**2/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x*atan(a*x)**2/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c**
3
```

3.302 $\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=169

$$-\frac{15x}{64c^3\left(a^2x^2+1\right)}-\frac{x}{32c^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)^2}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(}{8ac}$$

```
[Out] -1/32*x/c^3/(a^2*x^2+1)^2-15/64*x/c^3/(a^2*x^2+1)-15/64*arctan(a*x)/a/c^3+1
/8*arctan(a*x)/a/c^3/(a^2*x^2+1)^2+3/8*arctan(a*x)/a/c^3/(a^2*x^2+1)+1/4*x*
arctan(a*x)^2/c^3/(a^2*x^2+1)^2+3/8*x*arctan(a*x)^2/c^3/(a^2*x^2+1)+1/8*arc
tan(a*x)^3/a/c^3
```

Rubi [A] time = 0.12, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4900, 4892, 4930, 199, 205}

$$-\frac{15x}{64c^3\left(a^2x^2+1\right)}-\frac{x}{32c^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)^2}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)}{8ac^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(}{8ac}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(c + a^2*c*x^2)^3,x]
```

```
[Out] -x/(32*c^3*(1 + a^2*x^2)^2) - (15*x)/(64*c^3*(1 + a^2*x^2)) - (15*ArcTan[a*
x])/(64*a*c^3) + ArcTan[a*x]/(8*a*c^3*(1 + a^2*x^2)^2) + (3*ArcTan[a*x])/(8
*a*c^3*(1 + a^2*x^2)) + (x*ArcTan[a*x]^2)/(4*c^3*(1 + a^2*x^2)^2) + (3*x*Ar
cTan[a*x]^2)/(8*c^3*(1 + a^2*x^2)) + ArcTan[a*x]^3/(8*a*c^3)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
```

```
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx = \frac{\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2}+\frac{x\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2}-\frac{1}{8}\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx+\frac{3\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx}{4c}$$

$$= -\frac{x}{32c^3\left(1+a^2x^2\right)^2}+\frac{\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2}+\frac{x\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan^{-1}(ax)^2}{8c^3\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^3}{8ac^3}$$

$$= -\frac{x}{32c^3\left(1+a^2x^2\right)^2}-\frac{3x}{64c^3\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2}+\frac{3\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(a}{4c^3\left(1+a^2\right.}$$

$$= -\frac{x}{32c^3\left(1+a^2x^2\right)^2}-\frac{15x}{64c^3\left(1+a^2x^2\right)}-\frac{3\tan^{-1}(ax)}{64ac^3}+\frac{\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2}+\frac{3\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right.}$$

$$= -\frac{x}{32c^3\left(1+a^2x^2\right)^2}-\frac{15x}{64c^3\left(1+a^2x^2\right)}-\frac{15\tan^{-1}(ax)}{64ac^3}+\frac{\tan^{-1}(ax)}{8ac^3\left(1+a^2x^2\right)^2}+\frac{3\tan^{-1}(ax)}{8ac^3\left(1+a^2x\right.}$$

Mathematica [A] time = 0.05, size = 98, normalized size = 0.58

$$\frac{-ax\left(15a^2x^2+17\right)+8\left(a^2x^2+1\right)^2\tan^{-1}(ax)^3+8ax\left(3a^2x^2+5\right)\tan^{-1}(ax)^2+\left(-15a^4x^4-6a^2x^2+17\right)\tan^{-1}(a}{64ac^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^2/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-(a*x*(17 + 15*a^2*x^2)) + (17 - 6*a^2*x^2 - 15*a^4*x^4)*ArcTan[a*x] + 8*a
*x*(5 + 3*a^2*x^2)*ArcTan[a*x]^2 + 8*(1 + a^2*x^2)^2*ArcTan[a*x]^3)/(64*a*c
^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.69, size = 113, normalized size = 0.67

$$-\frac{15\,a^3x^3-8\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^3-8\left(3\,a^3x^3+5\,ax\right)\arctan\left(ax\right)^2+17\,ax+\left(15\,a^4x^4+6\,a^2x^2-17\right.}{64\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] -1/64*(15*a^3*x^3 - 8*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^3 - 8*(3*a^3*x^
3 + 5*a*x)*arctan(a*x)^2 + 17*a*x + (15*a^4*x^4 + 6*a^2*x^2 - 17)*arctan(a*
x))/(a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 159, normalized size = 0.94

$$\frac{x\arctan(ax)^2}{4c^3(a^2x^2+1)^2}+\frac{3x\arctan(ax)^2}{8c^3(a^2x^2+1)}+\frac{\arctan(ax)^3}{8ac^3}+\frac{\arctan(ax)}{8ac^3(a^2x^2+1)^2}+\frac{3\arctan(ax)}{8ac^3(a^2x^2+1)}-\frac{15a^2x^3}{64c^3(a^2x^2+1)^2}-\frac{17}{64c^3(a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/4*x*arctan(a*x)^2/c^3/(a^2*x^2+1)^2+3/8*x*arctan(a*x)^2/c^3/(a^2*x^2+1)+1
/8*arctan(a*x)^3/a/c^3+1/8*arctan(a*x)/a/c^3/(a^2*x^2+1)^2+3/8*arctan(a*x)/
a/c^3/(a^2*x^2+1)-15/64*a^2/c^3/(a^2*x^2+1)^2*x^3-17/64*x/c^3/(a^2*x^2+1)^2
-15/64*arctan(a*x)/a/c^3
```

maxima [A] time = 0.47, size = 232, normalized size = 1.37

$$\frac{1}{8}\left(\frac{3a^2x^3+5x}{a^4c^3x^4+2a^2c^3x^2+c^3}+\frac{3\arctan(ax)}{ac^3}\right)\arctan(ax)^2-\frac{\left(15a^3x^3-8\left(a^4x^4+2a^2x^2+1\right)\arctan(ax)^3+17ax+\right.}{64\left(a^7c^3x^4+2a^5c^3x^2+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((3*a^2*x^3 + 5*x)/(a^4*c^3*x^4 + 2*a^2*c^3*x^2 + c^3) + 3*arctan(a*x)/
(a*c^3))*arctan(a*x)^2 - 1/64*(15*a^3*x^3 - 8*(a^4*x^4 + 2*a^2*x^2 + 1)*arc
tan(a*x)^3 + 17*a*x + 15*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x))*a^2/(a^7*c^
3*x^4 + 2*a^5*c^3*x^2 + a^3*c^3) + 1/8*(3*a^2*x^2 - 3*(a^4*x^4 + 2*a^2*x^2
+ 1)*arctan(a*x)^2 + 4)*a*arctan(a*x)/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^
3)
```

mupad [B] time = 0.53, size = 157, normalized size = 0.93

$$\frac{\operatorname{atan}(a\,x)\left(\frac{1}{2\,a^3\,c^3}+\frac{3\,x^2}{8\,a\,c^3}\right)}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}-\frac{15\operatorname{atan}(a\,x)}{64\,a\,c^3}-\frac{\frac{15\,a^2\,x^3}{8}+\frac{17\,x}{8}}{8\,a^4\,c^3\,x^4+16\,a^2\,c^3\,x^2+8\,c^3}+\frac{\operatorname{atan}(a\,x)^2\left(\frac{3\,x^3}{8\,c^3}+\frac{5\,x}{8\,a^2\,c^3}\right)}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}+\frac{\operatorname{atan}(a\,x)^3}{8\,a\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(c + a^2*c*x^2)^3,x)
```

```
[Out] (atan(a*x)*(1/(2*a^3*c^3) + (3*x^2)/(8*a*c^3)))/(1/a^2 + 2*x^2 + a^2*x^4) -
 (15*atan(a*x))/(64*a*c^3) - ((17*x)/8 + (15*a^2*x^3)/8)/(8*c^3 + 16*a^2*c^
3*x^2 + 8*a^4*c^3*x^4) + (atan(a*x)^2*((3*x^3)/(8*c^3) + (5*x)/(8*a^2*c^3))
)/(1/a^2 + 2*x^2 + a^2*x^4) + atan(a*x)^3/(8*a*c^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{\operatorname{atan}^2(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**2/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c**3
```

3.303 $\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=236

$$-\frac{11}{32c^3\left(a^2x^2+1\right)}-\frac{1}{32c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(ax)^2}{2c^3\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}-\frac{11ax\tan^{-1}(ax)}{16c^3\left(a^2x^2+1\right)}-\frac{ax\tan^{-1}(ax)}{8c^3\left(a^2x^2+1\right)^2}+\frac{\mathrm{Li}_3\left(\right.}{}$$

```
[Out] -1/32/c^3/(a^2*x^2+1)^2-11/32/c^3/(a^2*x^2+1)-1/8*a*x*arctan(a*x)/c^3/(a^2*
x^2+1)^2-11/16*a*x*arctan(a*x)/c^3/(a^2*x^2+1)-11/32*arctan(a*x)^2/c^3+1/4*
arctan(a*x)^2/c^3/(a^2*x^2+1)^2+1/2*arctan(a*x)^2/c^3/(a^2*x^2+1)-1/3*I*arc
tan(a*x)^3/c^3+arctan(a*x)^2*ln(2-2/(1-I*a*x))/c^3-I*arctan(a*x)*polylog(2,
-1+2/(1-I*a*x))/c^3+1/2*polylog(3,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 0.48, antiderivative size = 236, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4966, 4924, 4868, 4884, 4992, 6610, 4930, 4892, 261, 4896}

$$\frac{\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^3}-\frac{i\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^3}-\frac{11}{32c^3\left(a^2x^2+1\right)}-\frac{1}{32c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(ax}{2c^3\left(a^2x^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] -1/(32*c^3*(1 + a^2*x^2)^2) - 11/(32*c^3*(1 + a^2*x^2)) - (a*x*ArcTan[a*x])
/(8*c^3*(1 + a^2*x^2)^2) - (11*a*x*ArcTan[a*x])/(16*c^3*(1 + a^2*x^2)) - (1
1*ArcTan[a*x]^2)/(32*c^3) + ArcTan[a*x]^2/(4*c^3*(1 + a^2*x^2)^2) + ArcTan[
a*x]^2/(2*c^3*(1 + a^2*x^2)) - ((I/3)*ArcTan[a*x]^3)/c^3 + (ArcTan[a*x]^2*L
og[2 - 2/(1 - I*a*x)])/c^3 - (I*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)])
/c^3 + PolyLog[3, -1 + 2/(1 - I*a*x)]/(2*c^3)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
```

```
b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} - \frac{1}{2}a\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)}\,dx}{c^2} - \frac{a^2\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{1}{32c^3\left(1+a^2x^2\right)^2} - \frac{ax\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} + \frac{\tan^{-1}(ax)^2}{2c^3\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^3}{3c^3}$$

$$= -\frac{1}{32c^3\left(1+a^2x^2\right)^2} - \frac{ax\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} - \frac{11ax\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} - \frac{11\tan^{-1}(ax)^2}{32c^3} + \frac{\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right.}$$

$$= -\frac{1}{32c^3\left(1+a^2x^2\right)^2} - \frac{11}{32c^3\left(1+a^2x^2\right)} - \frac{ax\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} - \frac{11ax\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} - \frac{11\tan^{-1}(a}{32c^3}$$

$$= -\frac{1}{32c^3\left(1+a^2x^2\right)^2} - \frac{11}{32c^3\left(1+a^2x^2\right)} - \frac{ax\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} - \frac{11ax\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} - \frac{11\tan^{-1}(a}{32c^3}$$

Mathematica [A] time = 0.27, size = 156, normalized size = 0.66

$$\frac{768i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) + 384\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) + 256i\tan^{-1}(ax)^3 + 768\tan^{-1}(ax)^2\log\left(1-e^{-2i\tan^{-1}(a}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] ((-32*I)*Pi^3 + (256*I)*ArcTan[a*x]^3 - 144*Cos[2*ArcTan[a*x]] + 288*ArcTan
[a*x]^2*Cos[2*ArcTan[a*x]] - 3*Cos[4*ArcTan[a*x]] + 24*ArcTan[a*x]^2*Cos[4*
ArcTan[a*x]] + 768*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + (768*I)*
ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + 384*PolyLog[3, E^((-2*I)*A
rcTan[a*x])] - 288*ArcTan[a*x]*Sin[2*ArcTan[a*x]] - 12*ArcTan[a*x]*Sin[4*Ar
cTan[a*x]])/(768*c^3)
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)^2}{a^6c^3x^7 + 3a^4c^3x^5 + 3a^2c^3x^3 + c^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.63, size = 1986, normalized size = 8.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x/(a^2*c*x^2+c)^3,x)
```

```
[Out] -11/32*arctan(a*x)^2/c^3+1/4*arctan(a*x)^2/c^3/(a^2*x^2+1)^2+1/2*arctan(a*x
)^2/c^3/(a^2*x^2+1)-1/3*I*arctan(a*x)^3/c^3+1/2*I/c^3*arctan(a*x)^2*Pi*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*
((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))-1/2*I/c^3*arctan(a
*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*cs
gn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-1/2*I/c^3*Pi*
arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*
x^2+1)+1)^2)^2-1/2*I/c^3*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1
))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/2*I/
c^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*a
rctan(a*x)^2*Pi+1/2*I/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-
1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)
^2/(a^2*x^2+1)+1))+1/4*I/c^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a
^2*x^2+1)+1)^2)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2*Pi+1/
4*I/c^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*csg
n(I*(1+I*a*x)^2/(a^2*x^2+1))*arctan(a*x)^2*Pi-1/4*I/c^3*csgn(I*(1+I*a*x)^2/
(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*arctan(a*x)^2*Pi+1/4*I/c
^3*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)
^2/(a^2*x^2+1)+1)^2)-3/2*I/c^3*arctan(a*x)/(8*I+8*a*x)*a*x+2/c^3*polylog(3,
-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2/c^3*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-
1/256/c^3*cos(4*arctan(a*x))-1/2*I/c^3*arctan(a*x)^2*Pi*csgn(((1+I*a*x)^2/(
a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/2*I/c^3*arctan(a*x)^2*Pi*csg
n(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3-1/4*I/c^3*arct
an(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3-1/4*I/c^3*arctan(a*x)^2*Pi*c
sgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+1/2*I/c^3*ar
ctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+
1))^3+1/4*I/c^3*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+3/
32/c^3/(I+a*x)*a*x+3/32/c^3/(a*x-I)*a*x-2*I/c^3*arctan(a*x)*polylog(2,-(1+I
*a*x)/(a^2*x^2+1)^(1/2))-2*I/c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1
)^(1/2))+1/2*I/c^3*arctan(a*x)^2*Pi+3/2*I/c^3*arctan(a*x)/(8*a*x-8*I)*a*x-1
/2*I/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*
a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-3/2/c^3*arctan(a*x)/(8
*a*x-8*I)-1/64/c^3*arctan(a*x)*sin(4*arctan(a*x))+1/c^3*arctan(a*x)^2*ln(1+
(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c^3*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)
^(1/2))-1/c^3*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+1/c^3*arctan(a*x)
^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c^3*arctan(a*x)^2*ln(2)-3/32*I/c^3/(I+
a*x)+3/32*I/c^3/(a*x-I)-1/2/c^3*arctan(a*x)^2*ln(a^2*x^2+1)+1/c^3*arctan(a*
x)^2*ln(a*x)-3/2/c^3*arctan(a*x)/(8*I+8*a*x)-1/4*I/c^3*csgn(I*(1+I*a*x)^2/(
a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*c
sgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2*Pi
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{2}}{\left(a^{2}cx^{2}+c\right)^{3}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^2}{x\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^3),x)
[Out] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{a^{6}x^{7}+3a^{4}x^{5}+3a^{2}x^{3}+x}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x/(a**2*c*x**2+c)**3,x)
[Out] Integral(atan(a*x)**2/(a**6*x**7 + 3*a**4*x**5 + 3*a**2*x**3 + x), x)/c**3
```

3.304 $\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=250

$$\frac{31a^2x}{64c^3\left(a^2x^2+1\right)}+\frac{a^2x}{32c^3\left(a^2x^2+1\right)^2}-\frac{7a^2x\tan^{-1}(ax)^2}{8c^3\left(a^2x^2+1\right)}-\frac{a^2x\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}-\frac{7a\tan^{-1}(ax)}{8c^3\left(a^2x^2+1\right)}-\frac{a\tan^{-1}(ax)}{8c^3\left(a^2x^2+1\right)^2}-\frac{ia\mathrm{Li}_2\left(\ldots\right)}{c^3}$$

```
[Out] 1/32*a^2*x/c^3/(a^2*x^2+1)^2+31/64*a^2*x/c^3/(a^2*x^2+1)+31/64*a*arctan(a*x
)/c^3-1/8*a*arctan(a*x)/c^3/(a^2*x^2+1)^2-7/8*a*arctan(a*x)/c^3/(a^2*x^2+1)
-I*a*arctan(a*x)^2/c^3-arctan(a*x)^2/c^3/x-1/4*a^2*x*arctan(a*x)^2/c^3/(a^2
*x^2+1)^2-7/8*a^2*x*arctan(a*x)^2/c^3/(a^2*x^2+1)-5/8*a*arctan(a*x)^3/c^3+2
*a*arctan(a*x)*ln(2-2/(1-I*a*x))/c^3-I*a*polylog(2,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 0.55, antiderivative size = 250, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4966, 4918, 4852, 4924, 4868, 2447, 4884, 4892, 4930, 199, 205, 4900}

$$-\frac{ia\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^3}+\frac{31a^2x}{64c^3\left(a^2x^2+1\right)}+\frac{a^2x}{32c^3\left(a^2x^2+1\right)^2}-\frac{7a^2x\tan^{-1}(ax)^2}{8c^3\left(a^2x^2+1\right)}-\frac{a^2x\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}-\frac{7a\tan^{-1}(ax)}{8c^3\left(a^2x^2+1\right)}\ldots$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^3),x]
```

```
[Out] (a^2*x)/(32*c^3*(1 + a^2*x^2)^2) + (31*a^2*x)/(64*c^3*(1 + a^2*x^2)) + (31*
a*ArcTan[a*x])/(64*c^3) - (a*ArcTan[a*x])/(8*c^3*(1 + a^2*x^2)^2) - (7*a*Ar
cTan[a*x])/(8*c^3*(1 + a^2*x^2)) - (I*a*ArcTan[a*x]^2)/c^3 - ArcTan[a*x]^2/
(c^3*x) - (a^2*x*ArcTan[a*x]^2)/(4*c^3*(1 + a^2*x^2)^2) - (7*a^2*x*ArcTan[a
*x]^2)/(8*c^3*(1 + a^2*x^2)) - (5*a*ArcTan[a*x]^3)/(8*c^3) + (2*a*ArcTan[a*
x]*Log[2 - 2/(1 - I*a*x)])/c^3 - (I*a*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^3
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
```

```
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2}-\frac{a^2x\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2}+\frac{1}{8}a^2\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx+\frac{\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)}\,dx}{c^2}-\frac{\left(3a^2\right)\ldots}{}$$

$$= \frac{a^2x}{32c^3\left(1+a^2x^2\right)^2}-\frac{a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2}-\frac{a^2x\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2}-\frac{7a^2x\tan^{-1}(ax)^2}{8c^3\left(1+a^2x^2\right)}-\frac{7a\tan^{-1}(ax)^3}{24c^3}\ldots$$

$$= \frac{a^2x}{32c^3\left(1+a^2x^2\right)^2}+\frac{3a^2x}{64c^3\left(1+a^2x^2\right)}-\frac{a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2}-\frac{7a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)}-\frac{\tan^{-1}(ax)^2}{c^3x}-\ldots$$

$$= \frac{a^2x}{32c^3\left(1+a^2x^2\right)^2}+\frac{31a^2x}{64c^3\left(1+a^2x^2\right)}+\frac{3a\tan^{-1}(ax)}{64c^3}-\frac{a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2}-\frac{7a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)}-\ldots$$

$$= \frac{a^2x}{32c^3\left(1+a^2x^2\right)^2}+\frac{31a^2x}{64c^3\left(1+a^2x^2\right)}+\frac{31a\tan^{-1}(ax)}{64c^3}-\frac{a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2}-\frac{7a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)}\ldots$$

$$= \frac{a^2x}{32c^3\left(1+a^2x^2\right)^2}+\frac{31a^2x}{64c^3\left(1+a^2x^2\right)}+\frac{31a\tan^{-1}(ax)}{64c^3}-\frac{a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2}-\frac{7a\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)}\ldots$$

Mathematica [A] time = 0.42, size = 139, normalized size = 0.56

$$-\frac{256iax\text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)+160ax\tan^{-1}(ax)^3+8\tan^{-1}(ax)^2\left(32iax+16ax\sin\left(2\tan^{-1}(ax)\right)+ax\sin\left(4\tan^{-1}(ax\ldots\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^3),x]
```

```
[Out] -1/256*(160*a*x*ArcTan[a*x]^3 + 4*a*x*ArcTan[a*x]*(32*Cos[2*ArcTan[a*x]] +
Cos[4*ArcTan[a*x]] - 128*Log[1 - E^((2*I)*ArcTan[a*x])]) + (256*I)*a*x*Poly
Log[2, E^((2*I)*ArcTan[a*x])] - a*x*(64*Sin[2*ArcTan[a*x]] + Sin[4*ArcTan[a
*x]]) + 8*ArcTan[a*x]^2*(32 + (32*I)*a*x + 16*a*x*Sin[2*ArcTan[a*x]] + a*x*
Sin[4*ArcTan[a*x]]))/(c^3*x)
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan\left(ax\right)^2}{a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4 + c^3*x
^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.18, size = 440, normalized size = 1.76

$$-\frac{\arctan(ax)^2}{c^3x}-\frac{7\arctan(ax)^2 a^4x^3}{8c^3\left(a^2x^2+1\right)^2}-\frac{9a^2x\arctan(ax)^2}{8c^3\left(a^2x^2+1\right)^2}-\frac{5a\arctan(ax)^3}{8c^3}+\frac{2a\arctan(ax)\ln(ax)}{c^3}-\frac{a\arctan(ax)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^3,x)
```

```
[Out] -arctan(a*x)^2/c^3/x-7/8/c^3*arctan(a*x)^2/(a^2*x^2+1)^2*a^4*x^3-9/8*a^2*x*
arctan(a*x)^2/c^3/(a^2*x^2+1)^2-5/8*a*arctan(a*x)^3/c^3+2*a/c^3*arctan(a*x)
*ln(a*x)-a/c^3*arctan(a*x)*ln(a^2*x^2+1)-1/8*a*arctan(a*x)/c^3/(a^2*x^2+1)^
2-7/8*a*arctan(a*x)/c^3/(a^2*x^2+1)+I*a/c^3*dilog(1+I*a*x)-I*a/c^3*dilog(1-
I*a*x)+1/2*I*a/c^3*ln(I+a*x)*ln(a^2*x^2+1)+1/4*I*a/c^3*ln(a*x-I)^2+1/2*I*a/
c^3*dilog(-1/2*I*(I+a*x))+1/2*I*a/c^3*ln(a*x-I)*ln(-1/2*I*(I+a*x))-1/2*I*a/
c^3*dilog(1/2*I*(a*x-I))-I*a/c^3*ln(a*x)*ln(1-I*a*x)-1/2*I*a/c^3*ln(I+a*x)*
ln(1/2*I*(a*x-I))+I*a/c^3*ln(a*x)*ln(1+I*a*x)-1/4*I*a/c^3*ln(I+a*x)^2-1/2*I
*a/c^3*ln(a*x-I)*ln(a^2*x^2+1)+31/64/c^3/(a^2*x^2+1)^2*x^3*a^4+33/64*a^2*x/
c^3/(a^2*x^2+1)^2+31/64*a*arctan(a*x)/c^3
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x^2\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{2}{\left(a x \right)}}{a^{6} x^{8} + 3 a^{4} x^{6} + 3 a^{2} x^{4} + x^{2}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**2/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**2/(a**6*x**8 + 3*a**4*x**6 + 3*a**2*x**4 + x**2), x)/c*
*3
```

3.305 $\int \frac{\tan^{-1}(ax)^2}{x^3(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=322

$$-\frac{3a^2\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c^3}+\frac{3ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c^3}+\frac{19a^2}{32c^3\left(a^2x^2+1\right)}+\frac{a^2}{32c^3\left(a^2x^2+1\right)^2}-\frac{a^2\log\left(a^2x^2+1\right)}{2c^3}-\frac{a^2}{c^3}$$

```
[Out] 1/32*a^2/c^3/(a^2*x^2+1)^2+19/32*a^2/c^3/(a^2*x^2+1)-a*arctan(a*x)/c^3/x+1/
8*a^3*x*arctan(a*x)/c^3/(a^2*x^2+1)^2+19/16*a^3*x*arctan(a*x)/c^3/(a^2*x^2+
1)+3/32*a^2*arctan(a*x)^2/c^3-1/2*arctan(a*x)^2/c^3/x^2-1/4*a^2*arctan(a*x)
^2/c^3/(a^2*x^2+1)^2-a^2*arctan(a*x)^2/c^3/(a^2*x^2+1)+I*a^2*arctan(a*x)^3/
c^3+a^2*ln(x)/c^3-1/2*a^2*ln(a^2*x^2+1)/c^3-3*a^2*arctan(a*x)^2*ln(2-2/(1-I
*a*x))/c^3+3*I*a^2*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))/c^3-3/2*a^2*polylo
g(3,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 1.33, antiderivative size = 322, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 16, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727, Rules used = {4966, 4918, 4852, 266, 36, 29, 31, 4884, 4924, 4868, 4992, 6610, 4930, 4892, 261, 4896}

$$-\frac{3a^2\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^3}+\frac{3ia^2\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^3}+\frac{19a^2}{32c^3\left(a^2x^2+1\right)}+\frac{a^2}{32c^3\left(a^2x^2+1\right)^2}-\frac{a^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)^3),x]
```

```
[Out] a^2/(32*c^3*(1 + a^2*x^2)^2) + (19*a^2)/(32*c^3*(1 + a^2*x^2)) - (a*ArcTan[
a*x])/(c^3*x) + (a^3*x*ArcTan[a*x])/(8*c^3*(1 + a^2*x^2)^2) + (19*a^3*x*Arc
Tan[a*x])/(16*c^3*(1 + a^2*x^2)) + (3*a^2*ArcTan[a*x]^2)/(32*c^3) - ArcTan[
a*x]^2/(2*c^3*x^2) - (a^2*ArcTan[a*x]^2)/(4*c^3*(1 + a^2*x^2)^2) - (a^2*Arc
Tan[a*x]^2)/(c^3*(1 + a^2*x^2)) + (I*a^2*ArcTan[a*x]^3)/c^3 + (a^2*Log[x])/
c^3 - (a^2*Log[1 + a^2*x^2])/(2*c^3) - (3*a^2*ArcTan[a*x]^2*Log[2 - 2/(1 -
I*a*x)])/c^3 + ((3*I)*a^2*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^3 -
 (3*a^2*PolyLog[3, -1 + 2/(1 - I*a*x)])/(2*c^3)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^3}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= a^4\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{a^2\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} + \frac{1}{2}a^3\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^3}\,dx}{c^3} - \frac{a^2\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)}\,dx}{c^2} - 2\left(\frac{a^2 \cdots}{\cdots}\right.$$

$$= \frac{a^2}{32c^3\left(1+a^2x^2\right)^2} + \frac{a^3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)^2}{2c^3x^2} - \frac{a^2\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} + \frac{ia^2\tan^{-1}(ax)^3}{3c^3} + \cdots$$

$$= \frac{a^2}{32c^3\left(1+a^2x^2\right)^2} + \frac{a^3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{3a^3x\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} + \frac{3a^2\tan^{-1}(ax)^2}{32c^3} - \frac{\tan^{-1}(ax)^2}{2c^3x^2} - \cdots$$

$$= \frac{a^2}{32c^3\left(1+a^2x^2\right)^2} + \frac{3a^2}{32c^3\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^3x} + \frac{a^3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{3a^3x\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} - \cdots$$

$$= \frac{a^2}{32c^3\left(1+a^2x^2\right)^2} + \frac{3a^2}{32c^3\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^3x} + \frac{a^3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{3a^3x\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} - \cdots$$

$$= \frac{a^2}{32c^3\left(1+a^2x^2\right)^2} + \frac{3a^2}{32c^3\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^3x} + \frac{a^3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{3a^3x\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} - \cdots$$

$$= \frac{a^2}{32c^3\left(1+a^2x^2\right)^2} + \frac{3a^2}{32c^3\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)}{c^3x} + \frac{a^3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{3a^3x\tan^{-1}(ax)}{16c^3\left(1+a^2x^2\right)} - \cdots$$

Mathematica [A] time = 0.82, size = 226, normalized size = 0.70

$$\frac{a^2\left(\log\left(\frac{ax}{\sqrt{a^2x^2+1}}\right) - \frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{2a^2x^2} - 3i\tan^{-1}(ax)\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) - \frac{3}{2}\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) - i\tan^{-1}(ax)^3 - \frac{\tan^{-1}(ax)}{ax} \cdots\right)}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)^3),x]
```

```
[Out] (a^2*((I/8)*Pi^3 - ArcTan[a*x]/(a*x) - ((1 + a^2*x^2)*ArcTan[a*x]^2)/(2*a^2
*x^2) - I*ArcTan[a*x]^3 + (5*Cos[2*ArcTan[a*x]])/16 - (5*ArcTan[a*x]^2*Cos[
2*ArcTan[a*x]])/8 + Cos[4*ArcTan[a*x]]/256 - (ArcTan[a*x]^2*Cos[4*ArcTan[a*
x]])/32 - 3*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + Log[(a*x)/Sqrt[
1 + a^2*x^2]] - (3*I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] - (3*P
olyLog[3, E^((-2*I)*ArcTan[a*x])])/2 + (5*ArcTan[a*x]*Sin[2*ArcTan[a*x]])/8
 + (ArcTan[a*x]*Sin[4*ArcTan[a*x]])/64))/c^3
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{a^6c^3x^9 + 3\,a^4c^3x^7 + 3\,a^2c^3x^5 + c^3x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^6*c^3*x^9 + 3*a^4*c^3*x^7 + 3*a^2*c^3*x^5 + c^3*x
^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 5.27, size = 2217, normalized size = 6.89

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^3,x)
```

```
[Out] 3/32*a^2*arctan(a*x)^2/c^3+3/4*I*a^2/c^3*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)/
(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))+3/2*I*a^2/c^3*arctan(a
*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1
)+1)^2)^2-3/4*I*a^2/c^3*Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-3/4*I*a
^2/c^3*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*
a*x)^2/(a^2*x^2+1)+1)^2)-3/2*I*a^2/c^3*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)/(a
^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2+3/2*I*a^2/c^3*arctan(a*x
)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn
(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/2*I*a^2/c^3*a
rctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a*x)^2/(a^
2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-3/4*I*a^2/c^3*arctan(a*x)^2*Pi*c
sgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/
(a^2*x^2+1)+1)^2)^2-1/2*arctan(a*x)^2/c^3/x^2+I*a^2*arctan(a*x)^3/c^3+a^2/c
^3*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)-6*a^2/c^3*polylog(3,(1+I*a*x)/(a^2*x^2
+1)^(1/2))+1/256*a^2/c^3*cos(4*arctan(a*x))+a^2/c^3*ln(1+(1+I*a*x)/(a^2*x^2
+1)^(1/2))-6*a^2/c^3*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/4*I*a^2/c^3*
Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(
a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)-3
/2*I*a^2/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((
1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/
(a^2*x^2+1)+1))-5/32*I*a^2/c^3/(a*x-I)-3*a^2/c^3*arctan(a*x)^2*ln(2)+1/64*a
^2/c^3*arctan(a*x)*sin(4*arctan(a*x))-3*a^2/c^3*arctan(a*x)^2*ln(1+(1+I*a*x
)/(a^2*x^2+1)^(1/2))-3*a^2/c^3*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/
2))+3*a^2/c^3*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)-3*a^2/c^3*arctan(
a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-5/32*a^3/c^3/(I+a*x)*x-5/32*a^3/c^3/
(a*x-I)*x-3*a^2/c^3*arctan(a*x)^2*ln(a*x)+5/2*a^2/c^3*arctan(a*x)/(8*I+8*a*
x)+3/2*I*a^2/c^3*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(
I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-3/2*I*a^2/c^3*
Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1
)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))-a^2*arc
tan(a*x)^2/c^3/(a^2*x^2+1)+6*I*a^2/c^3*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^
```

```
2*x^2+1)^(1/2))+6*I*a^2/c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/
2))-3/2*I*a^2/c^3*Pi*arctan(a*x)^2+5/2*I*a^3/c^3*arctan(a*x)/(8*I+8*a*x)*x-
5/2*I*a^3/c^3*arctan(a*x)/(8*a*x-8*I)*x+3/2*I*a^2/c^3*arctan(a*x)^2*Pi*csgn
(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/4*I*a^2/c^3*a
rctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^
2)^3-3/2*I*a^2/c^3*arctan(a*x)^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*
a*x)^2/(a^2*x^2+1)+1))^3-3/2*I*a^2/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2
/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3-3/4*I*a^2/c^3*arctan(a*x)^2*
Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+3/4*I*a^2/c^3*Pi*arctan(a*x)^2*c
sgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3+5/2*a^2/c^3*arctan(a*x)/(8*a*x-8*I)+3/2*a^
2/c^3*arctan(a*x)^2*ln(a^2*x^2+1)-I*a^2/c^3*arctan(a*x)+5/32*I*a^2/c^3/(I+a
*x)-a*arctan(a*x)/c^3/x-1/4*a^2*arctan(a*x)^2/c^3/(a^2*x^2+1)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{\left(a^2cx^2+c\right)^3x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^3*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)^2}{x^3\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\mathrm{atan}^2(ax)}{a^6x^9+3a^4x^7+3a^2x^5+x^3}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**3/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**2/(a**6*x**9 + 3*a**4*x**7 + 3*a**2*x**5 + x**3), x)/c*
*3
```

3.306 $\int \frac{\tan^{-1}(ax)^2}{x^4(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=317

$$\frac{10ia^3\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{3c^3}+\frac{35a^3\tan^{-1}(ax)^3}{24c^3}+\frac{10ia^3\tan^{-1}(ax)^2}{3c^3}-\frac{205a^3\tan^{-1}(ax)}{192c^3}-\frac{20a^3\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}(ax)}{3c^3}-$$

```
[Out] -1/3*a^2/c^3/x-1/32*a^4*x/c^3/(a^2*x^2+1)^2-47/64*a^4*x/c^3/(a^2*x^2+1)-205
/192*a^3*arctan(a*x)/c^3-1/3*a*arctan(a*x)/c^3/x^2+1/8*a^3*arctan(a*x)/c^3/
(a^2*x^2+1)^2+11/8*a^3*arctan(a*x)/c^3/(a^2*x^2+1)+10/3*I*a^3*arctan(a*x)^2
/c^3-1/3*arctan(a*x)^2/c^3/x^3+3*a^2*arctan(a*x)^2/c^3/x+1/4*a^4*x*arctan(a
*x)^2/c^3/(a^2*x^2+1)^2+11/8*a^4*x*arctan(a*x)^2/c^3/(a^2*x^2+1)+35/24*a^3*
arctan(a*x)^3/c^3-20/3*a^3*arctan(a*x)*ln(2-2/(1-I*a*x))/c^3+10/3*I*a^3*pol
ylog(2,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 1.53, antiderivative size = 317, normalized size of antiderivative = 1.00, number of steps used = 48, number of rules used = 14, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636, Rules used = {4966, 4918, 4852, 325, 203, 4924, 4868, 2447, 4884, 4892, 4930, 199, 205, 4900}

$$\frac{10ia^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{3c^3}-\frac{47a^4x}{64c^3\left(a^2x^2+1\right)}-\frac{a^4x}{32c^3\left(a^2x^2+1\right)^2}+\frac{11a^4x\tan^{-1}(ax)^2}{8c^3\left(a^2x^2+1\right)}+\frac{a^4x\tan^{-1}(ax)^2}{4c^3\left(a^2x^2+1\right)^2}+\frac{11a^3\tan}{8c^3(a}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)^3),x]
```

```
[Out] -a^2/(3*c^3*x) - (a^4*x)/(32*c^3*(1 + a^2*x^2)^2) - (47*a^4*x)/(64*c^3*(1 +
 a^2*x^2)) - (205*a^3*ArcTan[a*x])/(192*c^3) - (a*ArcTan[a*x])/(3*c^3*x^2)
+ (a^3*ArcTan[a*x])/(8*c^3*(1 + a^2*x^2)^2) + (11*a^3*ArcTan[a*x])/(8*c^3*(
1 + a^2*x^2)) + (((10*I)/3)*a^3*ArcTan[a*x]^2)/c^3 - ArcTan[a*x]^2/(3*c^3*x
^3) + (3*a^2*ArcTan[a*x]^2)/(c^3*x) + (a^4*x*ArcTan[a*x]^2)/(4*c^3*(1 + a^2
*x^2)^2) + (11*a^4*x*ArcTan[a*x]^2)/(8*c^3*(1 + a^2*x^2)) + (35*a^3*ArcTan[
a*x]^3)/(24*c^3) - (20*a^3*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/(3*c^3) + ((
(10*I)/3)*a^3*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^3
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
```

```
x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^3}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= a^4\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= \frac{a^3\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{a^4x\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} - \frac{1}{8}a^4\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^4}\,dx}{c^3} - \frac{a^2\int \frac{\tan^{-1}}{x^2(c+}}{c^2}$$

$$= -\frac{a^4x}{32c^3\left(1+a^2x^2\right)^2} + \frac{a^3\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)^2}{3c^3x^3} + \frac{a^4x\tan^{-1}(ax)^2}{4c^3\left(1+a^2x^2\right)^2} + \frac{3a^4x\tan^{-1}(ax)^2}{8c^3\left(1+a^2x^2\right)}$$

$$= -\frac{a^4x}{32c^3\left(1+a^2x^2\right)^2} - \frac{3a^4x}{64c^3\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} + \frac{3a^3\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^2}{3c^3x^3} +$$

$$= -\frac{a^4x}{32c^3\left(1+a^2x^2\right)^2} - \frac{15a^4x}{64c^3\left(1+a^2x^2\right)} - \frac{3a^3\tan^{-1}(ax)}{64c^3} - \frac{a\tan^{-1}(ax)}{3c^3x^2} + \frac{a^3\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right)^2} +$$

$$= -\frac{a^2}{3c^3x} - \frac{a^4x}{32c^3\left(1+a^2x^2\right)^2} - \frac{15a^4x}{64c^3\left(1+a^2x^2\right)} - \frac{15a^3\tan^{-1}(ax)}{64c^3} - \frac{a\tan^{-1}(ax)}{3c^3x^2} + \frac{a^3\tan^{-1}}{8c^3(1+}$$

$$= -\frac{a^2}{3c^3x} - \frac{a^4x}{32c^3\left(1+a^2x^2\right)^2} - \frac{15a^4x}{64c^3\left(1+a^2x^2\right)} - \frac{109a^3\tan^{-1}(ax)}{192c^3} - \frac{a\tan^{-1}(ax)}{3c^3x^2} + \frac{a^3\tan}{8c^3(1+}$$

Mathematica [A] time = 0.82, size = 189, normalized size = 0.60

$$\frac{a^3\left(-\frac{256\left(a^2x^2+1\right)\tan^{-1}(ax)}{a^2x^2} - \frac{256\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{a^3x^3} + 2560i\left(\tan^{-1}(ax)^2 + \text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)\right) + 1120\tan^{-1}(ax)^3 + \frac{256(10\,\text{t}}{}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)^3),x]
```

```
[Out] (a^3*((-256*(1 + a^2*x^2)*ArcTan[a*x])/(a^2*x^2) - (256*(1 + a^2*x^2)*ArcTa
n[a*x]^2)/(a^3*x^3) + 1120*ArcTan[a*x]^3 + (256*(-1 + 10*ArcTan[a*x]^2))/(a
*x) + 576*ArcTan[a*x]*Cos[2*ArcTan[a*x]] + 12*ArcTan[a*x]*Cos[4*ArcTan[a*x]
] - 5120*ArcTan[a*x]*Log[1 - E^((2*I)*ArcTan[a*x])] + (2560*I)*(ArcTan[a*x]
^2 + PolyLog[2, E^((2*I)*ArcTan[a*x])]) + 288*(-1 + 2*ArcTan[a*x]^2)*Sin[2*
ArcTan[a*x]] + 3*(-1 + 8*ArcTan[a*x]^2)*Sin[4*ArcTan[a*x]]))/(768*c^3)
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{a^6c^3x^{10} + 3\,a^4c^3x^8 + 3\,a^2c^3x^6 + c^3x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^2/(a^6*c^3*x^10 + 3*a^4*c^3*x^8 + 3*a^2*c^3*x^6 + c^3*
x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.15, size = 517, normalized size = 1.63

$$\frac{13a^4x\arctan(ax)^2}{8c^3\left(a^2x^2+1\right)^2}+\frac{11a^6\arctan(ax)^2x^3}{8c^3\left(a^2x^2+1\right)^2}-\frac{49a^4x}{64c^3\left(a^2x^2+1\right)^2}-\frac{a\arctan(ax)}{3c^3x^2}+\frac{a^3\arctan(ax)}{8c^3\left(a^2x^2+1\right)^2}+\frac{11a^3\arctan(ax)}{8c^3\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^3,x)
```

```
[Out] 13/8*a^4*x*arctan(a*x)^2/c^3/(a^2*x^2+1)^2+11/8*a^6/c^3*arctan(a*x)^2/(a^2*
x^2+1)^2*x^3-49/64*a^4*x/c^3/(a^2*x^2+1)^2-1/3*a*arctan(a*x)/c^3/x^2+1/8*a^
3*arctan(a*x)/c^3/(a^2*x^2+1)^2+11/8*a^3*arctan(a*x)/c^3/(a^2*x^2+1)+3*a^2*
arctan(a*x)^2/c^3/x-1/3*a^2/c^3/x-205/192*a^3*arctan(a*x)/c^3-1/3*arctan(a*
x)^2/c^3/x^3+35/24*a^3*arctan(a*x)^3/c^3-20/3*a^3/c^3*arctan(a*x)*ln(a*x)+1
0/3*a^3/c^3*arctan(a*x)*ln(a^2*x^2+1)+5/6*I*a^3/c^3*ln(I+a*x)^2+10/3*I*a^3/
c^3*dilog(1-I*a*x)-5/3*I*a^3/c^3*dilog(-1/2*I*(I+a*x))-10/3*I*a^3/c^3*dilog
(1+I*a*x)-5/6*I*a^3/c^3*ln(a*x-I)^2-47/64*a^6/c^3/(a^2*x^2+1)^2*x^3+5/3*I*a
^3/c^3*dilog(1/2*I*(a*x-I))+5/3*I*a^3/c^3*ln(a*x-I)*ln(a^2*x^2+1)+10/3*I*a^
3/c^3*ln(a*x)*ln(1-I*a*x)-10/3*I*a^3/c^3*ln(a*x)*ln(1+I*a*x)-5/3*I*a^3/c^3*
ln(a*x-I)*ln(-1/2*I*(I+a*x))-5/3*I*a^3/c^3*ln(I+a*x)*ln(a^2*x^2+1)+5/3*I*a^
3/c^3*ln(I+a*x)*ln(1/2*I*(a*x-I))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x^4\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{a^{6}x^{10}+3a^{4}x^{8}+3a^{2}x^{6}+x^{4}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**4/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**2/(a**6*x**10 + 3*a**4*x**8 + 3*a**2*x**6 + x**4), x)/c
**3
```

3.307 $\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=385

$$\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{15a^2}+\frac{1}{5}x^4\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2-\frac{x^3\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{10a}+\frac{11ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right.}{60a^4\sqrt{a^2cx^2+c}}$$

```
[Out] 1/30*(a^2*c*x^2+c)^(3/2)/a^4/c-11/30*I*c*arctan(a*x)*arctan((1+I*a*x)^(1/2)
/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+11/60*I*c*polyl
og(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c
)^(1/2)-11/60*I*c*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^
(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-11/60*(a^2*c*x^2+c)^(1/2)/a^4+1/12*x*arctan(a
*x)*(a^2*c*x^2+c)^(1/2)/a^3-1/10*x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a-2/15
*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^4+1/15*x^2*arctan(a*x)^2*(a^2*c*x^2+c)
^(1/2)/a^2+1/5*x^4*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.43, antiderivative size = 385, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4950, 4952, 261, 4890, 4886, 4930, 266, 43}

$$\frac{11ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{60a^4\sqrt{a^2cx^2+c}}-\frac{11ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{60a^4\sqrt{a^2cx^2+c}}+\frac{\left(a^2cx^2+c\right)^{3/2}}{30a^4c}-\frac{11\sqrt{a^2cx^2+c}}{60a^4}+\frac{1}{5}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] (-11*Sqrt[c + a^2*c*x^2])/(60*a^4) + (c + a^2*c*x^2)^(3/2)/(30*a^4*c) + (x*
Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(12*a^3) - (x^3*Sqrt[c + a^2*c*x^2]*ArcTan
[a*x])/(10*a) - (2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(15*a^4) + (x^2*Sqrt[
c + a^2*c*x^2]*ArcTan[a*x]^2)/(15*a^2) + (x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*
x]^2)/5 - (((11*I)/30)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*
x]/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^2*c*x^2]) + (((11*I)/60)*c*Sqrt[1 + a^
2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^
2*c*x^2]) - (((11*I)/60)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])
/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx = c\int \frac{x^3\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{x^5\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3a^2} + \frac{1}{5}x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{1}{5}(4c)\int \frac{x^3\tan^{-1}(}{\sqrt{c+a^2}}$$

$$= -\frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^3} - \frac{x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{10a} - \frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(a}{3a^4}$$

$$= \frac{\sqrt{c+a^2cx^2}}{3a^4} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{10a} - 2\sqrt{c+a}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{12a^4} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{10a} - 2\sqrt{c+}$$

$$= -\frac{11\sqrt{c+a^2cx^2}}{60a^4} + \frac{\left(c+a^2cx^2\right)^{3/2}}{30a^4c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^3\sqrt{c+a^2cx^2}}{10a}$$

Mathematica [A] time = 1.22, size = 360, normalized size = 0.94

$$-\frac{\left(a^2x^2+1\right)^2\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{176i\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{\left(a^2x^2+1\right)^{5/2}} + \frac{176i\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{\left(a^2x^2+1\right)^{5/2}} - \frac{110\tan^{-1}(ax)\log\left(1-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + \frac{110\tan^{-1}(ax)\,\text{lo}}{\sqrt{a^2}}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] -1/960*((1 + a^2*x^2)^2*Sqrt[c*(1 + a^2*x^2)]*(50 - 32*ArcTan[a*x]^2 + 72*C
os[2*ArcTan[a*x]] + 160*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 22*Cos[4*ArcTan[
a*x]] - (110*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] -
55*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 11*ArcTan[
a*x]*Cos[5*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (110*ArcTan[a*x]*Log
[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + 55*ArcTan[a*x]*Cos[3*ArcTan[
a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] + 11*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[
1 + I*E^(I*ArcTan[a*x])] - ((176*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1
+ a^2*x^2)^(5/2) + ((176*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^
(5/2) + 4*ArcTan[a*x]*Sin[2*ArcTan[a*x]] - 22*ArcTan[a*x]*Sin[4*ArcTan[a*x]
]))/a^4
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x^3\arctan(ax)^2\,,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.54, size = 235, normalized size = 0.61

$$\frac{\sqrt{c\,(ax-i)\,(ax+i)}\;\left(12\arctan(ax)^2x^4a^4-6\arctan(ax)\,x^3a^3+4\arctan(ax)^2x^2a^2+2a^2x^2+5\arctan(ax)\,xa-\right.}{60a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/60/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(12*arctan(a*x)^2*x^4*a^4-6*arctan(a*x)*
x^3*a^3+4*arctan(a*x)^2*x^2*a^2+2*a^2*x^2+5*arctan(a*x)*x*a-8*arctan(a*x)^2
-9)-11/60*(c*(a*x-I)*(I+a*x))^(1/2)*(I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2
))+arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*(1+I*
a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^4/(a^2*
x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^2cx^2+c}\,x^3\arctan(ax)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^3*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\mathrm{atan}\left(a\,x\right)^2\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^3\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^2(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**2*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2, x)
```

3.308 $\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=436

$$\frac{x\sqrt{a^2cx^2+c}}{12a^2}-\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{6a}+\frac{x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{8a^2}+\frac{1}{4}x^3\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2-\frac{ic\sqrt{a^2x^2+1}\,\mathrm{ta}}{4a}$$

```
[Out] -1/6*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))*c^(1/2)/a^3+1/4*I*c*arctan((1
+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c
)^(1/2)-1/4*I*c*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*
x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/4*I*c*arctan(a*x)*polylog(2,I*(1+I*a
*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/4*c*poly
log(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(
1/2)-1/4*c*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(
a^2*c*x^2+c)^(1/2)+1/12*x*(a^2*c*x^2+c)^(1/2)/a^2+1/12*arctan(a*x)*(a^2*c*x
^2+c)^(1/2)/a^3-1/6*x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a+1/8*x*arctan(a*x)
^2*(a^2*c*x^2+c)^(1/2)/a^2+1/4*x^3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.13, antiderivative size = 436, normalized size of antiderivative = 1.00, number of steps used = 35, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589, 321}

$$-\frac{ic\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{4a^3\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{4a^3\sqrt{a^2cx^2+c}}+\frac{c\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] (x*Sqrt[c + a^2*c*x^2])/(12*a^2) + (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(12*a^
3) - (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(6*a) + (x*Sqrt[c + a^2*c*x^2]*A
rcTan[a*x]^2)/(8*a^2) + (x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/4 + ((I/4)*
c*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^3*Sqrt[c +
a^2*c*x^2]) - (Sqrt[c]*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(6*a^3)
- ((I/4)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])]
)/(a^3*Sqrt[c + a^2*c*x^2]) + ((I/4)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLo
g[2, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + (c*Sqrt[1 + a^2*x^2]
*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(4*a^3*Sqrt[c + a^2*c*x^2]) - (c*Sqrt[
1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(4*a^3*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx = c\int \frac{x^2\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{x^4\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2} + \frac{1}{4}x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{1}{4}(3c)\int \frac{x^2\tan^{-1}(a}{\sqrt{c+a^2c}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax}{8a^2}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{12a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a} + \frac{x\sqrt{c+a}}{}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{12a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a} + \frac{x\sqrt{c+a}}{}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{12a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a} + \frac{x\sqrt{c+a}}{}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{12a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a} + \frac{x\sqrt{c+a}}{}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{12a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a} + \frac{x\sqrt{c+a}}{}$$

$$= \frac{x\sqrt{c+a^2cx^2}}{12a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a} + \frac{x\sqrt{c+a}}{}$$

Mathematica [A] time = 1.29, size = 267, normalized size = 0.61

$$\frac{\sqrt{a^2cx^2+c}\left(\left(a^2x^2+1\right)^{3/2}\left(-3\tan^{-1}(ax)^2\left(\sqrt{a^2x^2+1}\,\sin\left(3\tan^{-1}(ax)\right)-7ax\right)+2\left(\sqrt{a^2x^2+1}\,\sin\left(3\tan^{-1}(ax\right.\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(8*((3*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 - 2*
ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - (3*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*A
rcTan[a*x])] + (3*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + 3*PolyLo
```

```
g[3, (-I)*E^(I*ArcTan[a*x])] - 3*PolyLog[3, I*E^(I*ArcTan[a*x])]) + (1 + a^
2*x^2)^(3/2)*(ArcTan[a*x]*(2 + 6*Sqrt[1 + a^2*x^2]*Cos[3*ArcTan[a*x]]) - 3*
ArcTan[a*x]^2*(-7*a*x + Sqrt[1 + a^2*x^2]*Sin[3*ArcTan[a*x]]) + 2*(a*x + Sq
rt[1 + a^2*x^2]*Sin[3*ArcTan[a*x]]))))/(96*a^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x^2\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.77, size = 302, normalized size = 0.69

$$\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(6\arctan\left(ax\right)^2x^3a^3-4\arctan\left(ax\right)a^2x^2+3\arctan\left(ax\right)^2xa+2ax+2\arctan\left(ax\right)\right)}{24a^3}+\frac{i\sqrt{c\left(ax\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/24/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(6*arctan(a*x)^2*x^3*a^3-4*arctan(a*x)*a
^2*x^2+3*arctan(a*x)^2*x*a+2*a*x+2*arctan(a*x))+1/24*I*(c*(a*x-I)*(I+a*x))^
(1/2)*(3*I*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*arctan(a*x
)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*arctan(a*x)*polylog(2,-I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))+6*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
-6*I*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*polylog(3,I*(1+I*a*x)/(a
^2*x^2+1)^(1/2))+8*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^3/(a^2*x^2+1)^(1/
2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{a^2cx^2+c}\,x^2\arctan\left(ax\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^2\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2\sqrt{c\left(a^2x^2+1\right)}\,\operatorname{atan}^2\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**2*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2, x)
```

3.309 $\int x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=279

$$-\frac{ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3a^2\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3a^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}}{3a^2}+\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^2}{3a^2c}+\frac{2ic\sqrt{a^2x^2+1}}{3a}$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/a^2/c+2/3*I*c*arctan(a*x)*arctan((1+I
*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-1/3*
I*c*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^
2*c*x^2+c)^(1/2)+1/3*I*c*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*
x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+1/3*(a^2*c*x^2+c)^(1/2)/a^2-1/3*x*arct
an(a*x)*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.18, antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4930, 4878, 4890, 4886}

$$-\frac{ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3a^2\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3a^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}}{3a^2}+\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^2}{3a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] Sqrt[c + a^2*c*x^2]/(3*a^2) - (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*a) + (
(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/(3*a^2*c) + (((2*I)/3)*c*Sqrt[1 + a^2*
x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c + a^2
*c*x^2]) - ((I/3)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqr
t[1 - I*a*x]])/(a^2*Sqrt[c + a^2*c*x^2]) + ((I/3)*c*Sqrt[1 + a^2*x^2]*PolyL
og[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c + a^2*c*x^2])
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx = \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3a^2c} - \frac{2\int\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx}{3a}$$

$$= \frac{\sqrt{c+a^2cx^2}}{3a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a} + \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3a^2c} - \frac{c\int\frac{\tan^{-}}{\sqrt{c+}}}{3}$$

$$= \frac{\sqrt{c+a^2cx^2}}{3a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a} + \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3a^2c} - \frac{\left(c\sqrt{1+\right.}{3}$$

$$= \frac{\sqrt{c+a^2cx^2}}{3a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a} + \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3a^2c} + \frac{2ic\sqrt{1+}}{}$$

Mathematica [A] time = 0.62, size = 260, normalized size = 0.93

$$\frac{\left(a^2x^2+1\right)\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{4i\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{\left(a^2x^2+1\right)^{3/2}}+\frac{4i\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{\left(a^2x^2+1\right)^{3/2}}-\frac{3\tan^{-1}(ax)\log\left(1-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}}+\frac{3\tan^{-1}(ax)\log\left(1+ie^{i\tan^{-1}}\right.}{\sqrt{a^2x^2+1}}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] ((1 + a^2*x^2)*Sqrt[c*(1 + a^2*x^2)]*(2 + 4*ArcTan[a*x]^2 + 2*Cos[2*ArcTan[
a*x]] - (3*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - Ar
cTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (3*ArcTan[a*x]*
Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ArcTan[a*x]*Cos[3*ArcTan[
a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((4*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x
])])/(1 + a^2*x^2)^(3/2) + ((4*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2
*x^2)^(3/2) - 2*ArcTan[a*x]*Sin[2*ArcTan[a*x]]))/(12*a^2)
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.14, size = 198, normalized size = 0.71

$$\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(\arctan\left(ax\right)^{2}x^{2}a^{2}-\arctan\left(ax\right)xa+\arctan\left(ax\right)^{2}+1\right)}{3a^{2}}+\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(i\,\mathrm{dilog}\left(1-\frac{i(\cdots}{\sqrt{\cdots}}\right.\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/3/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)^2*x^2*a^2-arctan(a*x)*x*a+ar
ctan(a*x)^2+1)+1/3*(c*(a*x-I)*(I+a*x))^(1/2)*(I*dilog(1-I*(1+I*a*x)/(a^2*x^
2+1)^(1/2))+arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(
1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/
a^2/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{a^{2}cx^{2}+c}\,x\arctan\left(ax\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}\left(a\,x\right)^{2}\,\sqrt{c\,a^{2}\,x^{2}+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^2*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x*atan(a*x)^2*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{c\left(a^{2}x^{2}+1\right)}\,\mathrm{atan}^{2}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**2*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2, x)
```

3.310 $\int \sqrt{c + a^2cx^2} \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=340

$$\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{c\sqrt{a^2x^2+1}\text{Li}_3\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}$$

```
[Out] arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))*c^(1/2)/a-I*c*arctan((1+I*a*x)/(a^
2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+I*c*a
rctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a
^2*c*x^2+c)^(1/2)-I*c*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*
(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-c*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+c*polylog(3,I*(1+I*a*x)/(a
^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-arctan(a*x)*(a^2*c
*x^2+c)^(1/2)/a+1/2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 340, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4880, 4890, 4888, 4181, 2531, 2282, 6589, 217, 206}

$$\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{c\sqrt{a^2x^2+1}\ldots}{}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/a) + (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
^2)/2 - (I*c*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a*
Sqrt[c + a^2*c*x^2]) + (Sqrt[c]*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])
/a + (I*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])
/(a*Sqrt[c + a^2*c*x^2]) - (I*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, I*
E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - (c*Sqrt[1 + a^2*x^2]*PolyLog[
3, (-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + (c*Sqrt[1 + a^2*x^2]*
PolyLog[3, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
```

```
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \sqrt{c+a^2cx^2}\tan^{-1}(ax)^2\,dx = -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2+\frac{1}{2}c\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx+$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2+c\,\text{Subst}\left(\int \frac{1}{1-a^2cx^2}\,d\right.$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2+\frac{\sqrt{c}\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{c+a^2cx^2}}\right)}{a}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\,\text{ta}}\right.}{a\sqrt{c+a^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\,\text{ta}}\right.}{a\sqrt{c+a^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\,\text{ta}}\right.}{a\sqrt{c+a^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\,\text{ta}}\right.}{a\sqrt{c+a^2}}$$

Mathematica [A] time = 0.42, size = 201, normalized size = 0.59

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(ax\sqrt{a^2x^2+1}\tan^{-1}(ax)^2-2\sqrt{a^2x^2+1}\tan^{-1}(ax)+2\tanh^{-1}\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)+2i\tan^{-1}(ax)\text{Li}_2\left(-ie\right.\right.}{2a\sqrt{}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(-2*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + a*x*Sqrt[1 + a^2
*x^2]*ArcTan[a*x]^2 - (2*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 2*Arc
Tanh[(a*x)/Sqrt[1 + a^2*x^2]] + (2*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcT
an[a*x])] - (2*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - 2*PolyLog[3
, (-I)*E^(I*ArcTan[a*x])] + 2*PolyLog[3, I*E^(I*ArcTan[a*x])]))/(2*a*Sqrt[1
 + a^2*x^2])
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.84, size = 268, normalized size = 0.79

$$\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \arctan\left(ax\right)\left(\arctan\left(ax\right)xa-2\right)}{2a}-\frac{i\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(i\arctan\left(ax\right)^{2}\ln\left(1-\frac{i(iax+1)}{\sqrt{a^{2}x^{2}+1}}\right)-i\operatorname{arc}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/2/a*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(arctan(a*x)*x*a-2)-1/2*I*(c*(a
*x-I)*(I+a*x))^(1/2)*(I*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I
*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*arctan(a*x)*polylog(2,
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
-2*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*polylog(3,-I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))+4*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)))/a/(a^2*x
^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^{2}cx^{2}+c}\ \arctan\left(ax\right)^{2}\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^{2}\,\sqrt{c\,a^{2}\,x^{2}+c}\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^2*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{c\left(a^{2}x^{2}+1\right)}\ \operatorname{atan}^{2}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2, x)
```

3.311 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x}\,dx$

Optimal. Leaf size=439

$$-\frac{2ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2ic\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{2ic\sqrt{a^2}\ldots}{}$$

```
[Out] 4*I*c*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)
/(a^2*c*x^2+c)^(1/2)-2*c*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))
*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*I*c*arctan(a*x)*polylog(2,-(1+I*a*
x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*c*arctan(a*
x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(
1/2)-2*I*c*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/
(a^2*c*x^2+c)^(1/2)+2*I*c*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2
*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*c*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2
))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*c*polylog(3,(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^2*(a^2*c*x^2+c)^
(1/2)
```

Rubi [A] time = 0.51, antiderivative size = 439, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.417$, Rules used = {4950, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4890, 4886}

$$-\frac{2ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2ic\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\ldots}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x,x]
```

```
[Out] Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2 + ((4*I)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*
ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (2*c*Sqrt[1
+ a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] +
((2*I)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt
[c + a^2*c*x^2] - ((2*I)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*Ar
cTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((2*I)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, ((
-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] + ((2*I)*c*Sqrt[
1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*
c*x^2] - (2*c*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^
2*c*x^2] + (2*c*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a
^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x}\,dx = c\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{x\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 - (2ac)\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx + \frac{\left(c\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{1+a^2x^2}}}{\sqrt{c+a^2cx^2}}$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{\left(c\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^2\csc(x)\,dx, x, \tan^{-1}(ax)\right)}{\sqrt{c+a^2cx^2}} -$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{4ic\sqrt{1+a^2x^2}\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}} - \frac{2c\sqrt{1+a^2}}{}$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{4ic\sqrt{1+a^2x^2}\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}} - \frac{2c\sqrt{1+a^2}}{}$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{4ic\sqrt{1+a^2x^2}\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}} - \frac{2c\sqrt{1+a^2}}{}$$

$$= \sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{4ic\sqrt{1+a^2x^2}\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}} - \frac{2c\sqrt{1+a^2}}{}$$

Mathematica [A] time = 0.27, size = 250, normalized size = 0.57

$$\frac{\sqrt{a^2cx^2+c}\left(\sqrt{a^2x^2+1}\tan^{-1}(ax)^2 + 2i\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - 2i\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right) - 2i\text{Li}_2\left(-ie^{i\tan}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x,x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + ArcTan[a*x]^2*Log[1
 - E^(I*ArcTan[a*x])] - 2*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] + 2*ArcT
an[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] - ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*
x])] + (2*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] - (2*I)*PolyLog[2,
(-I)*E^(I*ArcTan[a*x])] + (2*I)*PolyLog[2, I*E^(I*ArcTan[a*x])] - (2*I)*Arc
Tan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] - 2*PolyLog[3, -E^(I*ArcTan[a*x])] +
 2*PolyLog[3, E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2]
```

fricas [F] time = 1.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\arctan(ax)^2}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.97, size = 337, normalized size = 0.77

$$\sqrt{c\,(ax-i)\,(ax+i)}\ \arctan(ax)^2 - \frac{i\sqrt{c\,(ax-i)\,(ax+i)}\ \left(i\arctan(ax)^2\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-i\arctan(ax)^2\ln\left(1+\frac{i}{\sqrt{a}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x,x)
```

```
[Out] (c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^2-I*(c*(a*x-I)*(I+a*x))^(1/2)*(I*arct
an(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)^2*ln(1+(1+I*a*x)/
(a^2*x^2+1)^(1/2))+2*I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*
arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*arctan(a*x)*polylog(2,(1+
I*a*x)/(a^2*x^2+1)^(1/2))-2*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1
/2))+2*I*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*polylog(3,-(1+I*a*x)/(a
^2*x^2+1)^(1/2))+2*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*dilog(1-I*(1+I*
a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2cx^2+c}\ \arctan(ax)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)^2\,\sqrt{c\,a^2\,x^2+c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\ \mathrm{atan}^2(ax)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2*(a**2*c*x**2+c)**(1/2)/x,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2/x, x)
```

3.312 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x^2}\,dx$

Optimal. Leaf size=458

$$\frac{2iac\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2iac\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac\sqrt{}}{}$$

```
[Out] -2*I*a*c*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2
)/(a^2*c*x^2+c)^(1/2)-4*a*c*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(
1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*I*a*c*arctan(a*x)*polylog(2,-
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*a*
c*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a
^2*c*x^2+c)^(1/2)+2*I*a*c*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*
x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*a*c*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x
)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*a*c*polylog(3,-I*(1+I*a*x)
/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*a*c*polylog(3,I
*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-arctan(
a*x)^2*(a^2*c*x^2+c)^(1/2)/x
```

Rubi [A] time = 0.53, antiderivative size = 458, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4950, 4944, 4958, 4954, 4890, 4888, 4181, 2531, 2282, 6589}

$$\frac{2iac\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2iac\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x) - ((2*I)*a*c*Sqrt[1 + a^2*x^2]*Arc
Tan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2] - (4*a*c*Sqrt[1 +
 a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^
2*c*x^2] + ((2*I)*a*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*Ar
cTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((2*I)*a*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]
*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((2*I)*a*c*Sqrt[1 +
 a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^
2] - ((2*I)*a*c*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x
]])/Sqrt[c + a^2*c*x^2] - (2*a*c*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*Arc
Tan[a*x])])/Sqrt[c + a^2*c*x^2] + (2*a*c*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(
I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x^2}\,dx = c\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x} + (2ac)\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx + \frac{\left(a^2c\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}}{\sqrt{1+}}}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x} + \frac{\left(ac\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^2\sec(x)\,dx, x, \tan^{-1}(ax)\right)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x} - \frac{2iac\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} - \frac{4ac}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x} - \frac{2iac\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} - \frac{4ac}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x} - \frac{2iac\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} - \frac{4ac}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x} - \frac{2iac\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} - \frac{4ac}{}$$

Mathematica [A] time = 0.80, size = 265, normalized size = 0.58

$$-\frac{a\sqrt{c\left(a^2x^2+1\right)}\left(\frac{\sqrt{a^2x^2+1}\tan^{-1}(ax)^2}{ax} - 2i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) + 2i\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right) - 2i\text{Li}_2\left(-e^{i}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] -((a*Sqrt[c*(1 + a^2*x^2)]*((Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2)/(a*x) - 2*Arc
Tan[a*x]*Log[1 - E^(I*ArcTan[a*x])] - ArcTan[a*x]^2*Log[1 - I*E^(I*ArcTan[a
*x])] + ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] + 2*ArcTan[a*x]*Log[1 +
E^(I*ArcTan[a*x])] - (2*I)*PolyLog[2, -E^(I*ArcTan[a*x])] - (2*I)*ArcTan[a*
x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (2*I)*ArcTan[a*x]*PolyLog[2, I*E^(I
*ArcTan[a*x])] + (2*I)*PolyLog[2, E^(I*ArcTan[a*x])] + 2*PolyLog[3, (-I)*E^
(I*ArcTan[a*x])] - 2*PolyLog[3, I*E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\arctan(ax)^2}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.94, size = 309, normalized size = 0.67

$$-\frac{\sqrt{c\,(ax-i)\,(ax+i)}\;\arctan\left(ax\right)^{2}}{x}-\frac{a\sqrt{c\,(ax-i)\,(ax+i)}\;\left(-\arctan\left(ax\right)^{2}\ln\left(1-\frac{i(iax+1)}{\sqrt{a^{2}x^{2}+1}}\right)+2i\arctan\left(ax\right)\operatorname{polylo}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2,x)
```

```
[Out] -(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^2/x-a*(c*(a*x-I)*(I+a*x))^(1/2)*(-ar
ctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*arctan(a*x)*polylog(2,I
*(1+I*a*x)/(a^2*x^2+1)^(1/2))+arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))-2*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*arctan(a*x
)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*dilog((1+I*a*x)/(a^2*x^2+1)^(1/2))-
2*I*dilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1
)^(1/2))+2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{a^{2}cx^{2}+c}\;\arctan\left(ax\right)^{2}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^{2}\,\sqrt{c\,a^{2}\,x^{2}+c}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x^2,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{c\left(a^{2}x^{2}+1\right)}\;\operatorname{atan}^{2}\left(ax\right)}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2*(a**2*c*x**2+c)**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2/x**2, x)
```

3.313 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x^3}\,dx$

Optimal. Leaf size=328

$$\frac{ia^2c\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{ia^2c\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{a^2c\sqrt{a^2x^2+1}\,\text{Li}_3\left(-e^{i\tan^{-1}\right.}}{\sqrt{a^2cx^2+c}}$$

```
[Out] -a^2*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))*c^(1/2)-a^2*c*arctan(a*x)^2*arcta
nh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+I*a^2
*c*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a
^2*c*x^2+c)^(1/2)-I*a^2*c*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2)
)*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a^2*c*polylog(3,-(1+I*a*x)/(a^2*x^2
+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+a^2*c*polylog(3,(1+I*a*x)/
(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a*arctan(a*x)*(a^2
*c*x^2+c)^(1/2)/x-1/2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 0.86, antiderivative size = 328, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4962, 4944, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589}

$$\frac{ia^2c\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{ia^2c\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-a^2c\sqrt{a^2x}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] -((a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
^2)/(2*x^2) - (a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*
x])])/Sqrt[c + a^2*c*x^2] - a^2*Sqrt[c]*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]
] + (I*a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/
Sqrt[c + a^2*c*x^2] - (I*a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(
I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (a^2*c*Sqrt[1 + a^2*x^2]*PolyLog[3,
-E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (a^2*c*Sqrt[1 + a^2*x^2]*PolyLog
[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
```

```
+ 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x^3}\,dx = c\int \frac{\tan^{-1}(ax)^2}{x^3\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} + (ac)\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx - \frac{1}{2}\left(a^2c\right)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} + \left(a^2c\right)\int \frac{1}{x\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{2a^2c\sqrt{1+a^2x^2}\tan^{-1}(ax}{\sqrt{c+a}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\tan^{-1}(ax)}{\sqrt{c+a^2}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\tan^{-1}(ax)}{\sqrt{c+a^2}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\tan^{-1}(ax)}{\sqrt{c+a^2}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\tan^{-1}(ax)}{\sqrt{c+a^2}}$$

Mathematica [A] time = 1.93, size = 222, normalized size = 0.68

$$a^2\sqrt{c\left(a^2x^2+1\right)}\left(8i\tan^{-1}(ax)\left(\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)\right)+8\left(\text{Li}_3\left(e^{i\tan^{-1}(ax)}\right)-\text{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)\right)-$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] (a^2*Sqrt[c*(1 + a^2*x^2)]*(-4*ArcTan[a*x]*Cot[ArcTan[a*x]/2] - ArcTan[a*x]
^2*Csc[ArcTan[a*x]/2]^2 + 4*ArcTan[a*x]^2*(Log[1 - E^(I*ArcTan[a*x])] - Log
[1 + E^(I*ArcTan[a*x])]) + 8*Log[Tan[ArcTan[a*x]/2]] + (8*I)*ArcTan[a*x]*(P
olyLog[2, -E^(I*ArcTan[a*x])] - PolyLog[2, E^(I*ArcTan[a*x])]) + 8*(-PolyLo
g[3, -E^(I*ArcTan[a*x])] + PolyLog[3, E^(I*ArcTan[a*x])]) + ArcTan[a*x]^2*S
ec[ArcTan[a*x]/2]^2 - 4*ArcTan[a*x]*Tan[ArcTan[a*x]/2]))/(8*Sqrt[1 + a^2*x^
2])
```

fricas [F] time = 1.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.35, size = 255, normalized size = 0.78

$$-\frac{\sqrt{c(ax-i)(ax+i)}\,\arctan(ax)(2ax+\arctan(ax))}{2x^2}+\frac{a^2\sqrt{c(ax-i)(ax+i)}\,\left(\arctan(ax)^2\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-\text{arc}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^3,x)
```

```
[Out] -1/2*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(2*a*x+arctan(a*x))/x^2+1/2*a^2*
(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-
arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*arctan(a*x)*polylog(2,(
1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1
)^(1/2))+2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog(3,-(1+I*a*x)/(a
^2*x^2+1)^(1/2))-4*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}(a\,x)^2\,\sqrt{c\,a^2\,x^2+c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x^3,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\ \operatorname{atan}^2\left(ax\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2*(a**2*c*x**2+c)**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2/x**3, x)
```

3.314 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x^4}\,dx$

Optimal. Leaf size=275

$$-\frac{a^2\sqrt{a^2cx^2+c}}{3x}-\frac{a\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{3x^2}-\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^2}{3cx^3}+\frac{ia^3c\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}-\frac{ia^3c\sqrt{a^2x^2+}}{3\sqrt{a^2}}$$

```
[Out] -1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/c/x^3-2/3*a^3*c*arctan(a*x)*arctanh(
(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+1/3*
I*a^3*c*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*
c*x^2+c)^(1/2)-1/3*I*a^3*c*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*
x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/3*a^2*(a^2*c*x^2+c)^(1/2)/x-1/3*a*arctan
(a*x)*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 0.43, antiderivative size = 275, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4944, 4946, 4962, 264, 4958, 4954}

$$\frac{ia^3c\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}-\frac{ia^3c\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}-\frac{a^2\sqrt{a^2cx^2+c}}{3x}-\frac{a\sqrt{a^2cx^2+c}\tan^{-1}(a}{3x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -(a^2*Sqrt[c + a^2*c*x^2])/(3*x) - (a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*x
^2) - ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/(3*c*x^3) - (2*a^3*c*Sqrt[1 + a
^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(3*Sqrt[c + a
^2*c*x^2]) + ((I/3)*a^3*c*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sq
rt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - ((I/3)*a^3*c*Sqrt[1 + a^2*x^2]*PolyL
og[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^4}\,dx = -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3cx^3} + \frac{1}{3}(2a)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^3}\,dx$$

$$= -\frac{2a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3cx^3} - \frac{1}{3}(2ac)\int \frac{\tan^{-1}(ax}{x^3\sqrt{c+a^2c}}$$

$$= -\frac{2a^2\sqrt{c+a^2cx^2}}{3x} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3cx^3} - \frac{1}{3}\left(a\right.$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}}{3x} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3cx^3} + \frac{\left(a^3c\right.}{}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}}{3x} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3cx^3} - \frac{2a^3c}{}$$

Mathematica [A] time = 1.72, size = 239, normalized size = 0.87

$$-\frac{c\sqrt{a^2x^2+1}\left(-4ia^3x^3\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)+4ia^3x^3\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+\sqrt{a^2x^2+1}\left(4a^2x^2+4\left(a^2x^2+1\right)\tan^{-1}(ax)^2\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -1/12*(c*Sqrt[1 + a^2*x^2]*((-4*I)*a^3*x^3*PolyLog[2, -E^(I*ArcTan[a*x])] +
 (4*I)*a^3*x^3*PolyLog[2, E^(I*ArcTan[a*x])] + Sqrt[1 + a^2*x^2]*(4*a^2*x^2
 + 4*(1 + a^2*x^2)*ArcTan[a*x]^2 + ArcTan[a*x]*(a*x*(4 - 3*Sqrt[1 + a^2*x^2
]*Log[1 - E^(I*ArcTan[a*x])] + 3*Sqrt[1 + a^2*x^2]*Log[1 + E^(I*ArcTan[a*x]
)]) + (1 + a^2*x^2)*(Log[1 - E^(I*ArcTan[a*x])] - Log[1 + E^(I*ArcTan[a*x])
])*Sin[3*ArcTan[a*x]]))))/(x^3*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.53, size = 195, normalized size = 0.71

$$-\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(\arctan\left(ax\right)^2x^2a^2+a^2x^2+\arctan\left(ax\right)xa+\arctan\left(ax\right)^2\right)}{3x^3}+\frac{ia^3\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(i\,\text{arcta}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^4,x)
```

```
[Out] -1/3*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)^2*x^2*a^2+a^2*x^2+arctan(a*x)*x
*a+arctan(a*x)^2)/x^3+1/3*I*a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(I*arctan(a*x)*ln
(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1
/2))+polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,(1+I*a*x)/(a^2*x^2+1
)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/x^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^2\,\sqrt{c\,a^2\,x^2+c}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x^4,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(1/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^2\left(ax\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2*(a**2*c*x**2+c)**(1/2)/x**4,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2/x**4, x)
```

3.315 $\int x^3 \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=476

$$\frac{cx^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{35a^2}+\frac{1}{7}a^2cx^6\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2-\frac{1}{21}acx^5\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)+\frac{8}{35}cx^4\sqrt{a^2cx^2+c}\,\tan^{-}$$

```
[Out] -17/1260*(a^2*c*x^2+c)^(3/2)/a^4+1/105*(a^2*c*x^2+c)^(5/2)/a^4/c-17/140*I*c
^2*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^
4/(a^2*c*x^2+c)^(1/2)+17/280*I*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(
1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-17/280*I*c^2*polylog(2,I*(1
+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-17
/280*c*(a^2*c*x^2+c)^(1/2)/a^4+3/56*c*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^3
-23/420*c*x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a-1/21*a*c*x^5*arctan(a*x)*(a
^2*c*x^2+c)^(1/2)-2/35*c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^4+1/35*c*x^2*a
rctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^2+8/35*c*x^4*arctan(a*x)^2*(a^2*c*x^2+c)
^(1/2)+1/7*a^2*c*x^6*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 4.07, antiderivative size = 476, normalized size of antiderivative = 1.00, number of steps used = 75, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4950, 4952, 261, 4890, 4886, 4930, 266, 43}

$$\frac{17ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{280a^4\sqrt{a^2cx^2+c}}-\frac{17ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{280a^4\sqrt{a^2cx^2+c}}-\frac{17ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\right.}{140a^4\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (-17*c*Sqrt[c + a^2*c*x^2])/(280*a^4) - (17*(c + a^2*c*x^2)^(3/2))/(1260*a^
4) + (c + a^2*c*x^2)^(5/2)/(105*a^4*c) + (3*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[
a*x])/(56*a^3) - (23*c*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(420*a) - (a*c*
x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/21 - (2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x]^2)/(35*a^4) + (c*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(35*a^2) + (8*c
*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/35 + (a^2*c*x^6*Sqrt[c + a^2*c*x^2]
*ArcTan[a*x]^2)/7 - (((17*I)/140)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[
Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^2*c*x^2]) + (((17*I)/280)
*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/
(a^4*Sqrt[c + a^2*c*x^2]) - (((17*I)/280)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2,
(I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^3 \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx = c\int x^3\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 \, dx + \left(a^2c\right)\int x^5\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 \, dx$$

$$= c^2\int \frac{x^3\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} \, dx + 2\left(\left(a^2c^2\right)\int \frac{x^5\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} \, dx\right) + \left(a^4c^2\right)\int \frac{x^7\tan^{-1}}{\sqrt{c+a^2}}$$

$$= \frac{cx^2\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2}{3a^2} + \frac{1}{7}a^2cx^6\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 - \frac{\left(2c^2\right)\int \frac{x\tan^{-1}(}{\sqrt{c+a^2c}}}{3a^2}$$

$$= -\frac{cx\sqrt{c+a^2cx^2} \tan^{-1}(ax)}{3a^3} - \frac{1}{21}acx^5\sqrt{c+a^2cx^2} \tan^{-1}(ax) - \frac{2c\sqrt{c+a^2cx^2} \text{ ta}}{3a^4}$$

$$= \frac{c\sqrt{c+a^2cx^2}}{3a^4} - \frac{cx\sqrt{c+a^2cx^2} \tan^{-1}(ax)}{3a^3} + \frac{61cx^3\sqrt{c+a^2cx^2} \tan^{-1}(ax)}{420a} - \frac{1}{21}$$

$$= \frac{c\sqrt{c+a^2cx^2}}{3a^4} - \frac{131cx\sqrt{c+a^2cx^2} \tan^{-1}(ax)}{168a^3} + \frac{61cx^3\sqrt{c+a^2cx^2} \tan^{-1}(ax)}{420a} -$$

$$= \frac{139c\sqrt{c+a^2cx^2}}{168a^4} - \frac{2\left(c+a^2cx^2\right)^{3/2}}{63a^4} + \frac{\left(c+a^2cx^2\right)^{5/2}}{105a^4c} - \frac{131cx\sqrt{c+a^2cx^2} \text{ tan}}{168a^3}$$

$$= \frac{817c\sqrt{c+a^2cx^2}}{840a^4} - \frac{101\left(c+a^2cx^2\right)^{3/2}}{1260a^4} + \frac{\left(c+a^2cx^2\right)^{5/2}}{105a^4c} - \frac{131cx\sqrt{c+a^2cx^2} \text{ ta}}{168a^3}$$

Mathematica [A] time = 4.81, size = 797, normalized size = 1.67

$$\frac{c\left(a^2x^2+1\right)^2\sqrt{a^2cx^2+c}\left(\left(a^2x^2+1\right)\left(-5376\cos\left(2\tan^{-1}(ax)\right)\tan^{-1}(ax)^2+6720\cos\left(4\tan^{-1}(ax)\right)\tan^{-1}(ax)^2+\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*(1 + a^2*x^2)^2*Sqrt[c + a^2*c*x^2]*(-168*(50 - 32*ArcTan[a*x]^2 + 72*Co
s[2*ArcTan[a*x]] + 160*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 22*Cos[4*ArcTan[a
*x]] - (110*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 5
5*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 11*ArcTan[a
*x]*Cos[5*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (110*ArcTan[a*x]*Log[
1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + 55*ArcTan[a*x]*Cos[3*ArcTan[a
*x]]*Log[1 + I*E^(I*ArcTan[a*x])] + 11*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1
 + I*E^(I*ArcTan[a*x])] - ((176*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 +
 a^2*x^2)^(5/2) + ((176*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(
5/2) + 4*ArcTan[a*x]*Sin[2*ArcTan[a*x]] - 22*ArcTan[a*x]*Sin[4*ArcTan[a*x]]
) + (1 + a^2*x^2)*(4116 + 10944*ArcTan[a*x]^2 + 6262*Cos[2*ArcTan[a*x]] - 5
376*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 2764*Cos[4*ArcTan[a*x]] + 6720*ArcTa
n[a*x]^2*Cos[4*ArcTan[a*x]] + 618*Cos[6*ArcTan[a*x]] - (10815*ArcTan[a*x]*L
og[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 6489*ArcTan[a*x]*Cos[3*Arc
Tan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 2163*ArcTan[a*x]*Cos[5*ArcTan[a*x]
]*Log[1 - I*E^(I*ArcTan[a*x])] - 309*ArcTan[a*x]*Cos[7*ArcTan[a*x]]*Log[1 -
 I*E^(I*ArcTan[a*x])] + (10815*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sq
rt[1 + a^2*x^2] + 6489*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan
[a*x])] + 2163*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])]
```

```
+ 309*ArcTan[a*x]*Cos[7*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((19776
*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(7/2) + ((19776*I)*Po
lyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(7/2) - 1266*ArcTan[a*x]*Sin[2
*ArcTan[a*x]] + 360*ArcTan[a*x]*Sin[4*ArcTan[a*x]] - 618*ArcTan[a*x]*Sin[6*
ArcTan[a*x]])))/(161280*a^4)
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^5 + cx^3\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^5 + c*x^3)*sqrt(a^2*c*x^2 + c)*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.28, size = 271, normalized size = 0.57

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(360\arctan\left(ax\right)^2x^6a^6 - 120\arctan\left(ax\right)x^5a^5 + 576\arctan\left(ax\right)^2x^4a^4 + 24a^4x^4 - 138\,\mathrm{arc}\right.}{2520a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x)
```

```
[Out] 1/2520*c/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(360*arctan(a*x)^2*x^6*a^6-120*arcta
n(a*x)*x^5*a^5+576*arctan(a*x)^2*x^4*a^4+24*a^4*x^4-138*arctan(a*x)*x^3*a^3
+72*arctan(a*x)^2*x^2*a^2+14*a^2*x^2+135*arctan(a*x)*x*a-144*arctan(a*x)^2-
163)-17/280*c*(c*(a*x-I)*(I+a*x))^(1/2)*(I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))+arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^4/(
a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{3}{2}}x^3\arctan\left(ax\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^3*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2 + c\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3}\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^{2}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**(3/2)*atan(a*x)**2,x)
```

```
[Out] Integral(x**3*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2, x)
```

3.316 $\int x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=531

$$\frac{cx\sqrt{a^2cx^2+c}}{36a^2}-\frac{19cx^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{180a}+\frac{cx\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{16a^2}+\frac{1}{6}a^2cx^5\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2-\frac{1}{15}acx$$

```
[Out] -41/360*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^3+1/8*I*c^2*arct
an((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*
x^2+c)^(1/2)-1/8*I*c^2*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)
)*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/8*I*c^2*arctan(a*x)*polylog(2
,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1
/8*c^2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2
*c*x^2+c)^(1/2)-1/8*c^2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1
)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/36*c*x*(a^2*c*x^2+c)^(1/2)/a^2+1/60*c*x^3
*(a^2*c*x^2+c)^(1/2)+31/360*c*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^3-19/180*c*
x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a-1/15*a*c*x^4*arctan(a*x)*(a^2*c*x^2+c
)^(1/2)+1/16*c*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^2+7/24*c*x^3*arctan(a*
x)^2*(a^2*c*x^2+c)^(1/2)+1/6*a^2*c*x^5*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 3.19, antiderivative size = 531, normalized size of antiderivative = 1.00, number of steps used = 92, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589, 321}

$$-\frac{ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{8a^3\sqrt{a^2cx^2+c}}+\frac{ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{8a^3\sqrt{a^2cx^2+c}}+\frac{c^2\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*x*Sqrt[c + a^2*c*x^2])/(36*a^2) + (c*x^3*Sqrt[c + a^2*c*x^2])/60 + (31*c
*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(360*a^3) - (19*c*x^2*Sqrt[c + a^2*c*x^2]
*ArcTan[a*x])/(180*a) - (a*c*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/15 + (c*x
*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(16*a^2) + (7*c*x^3*Sqrt[c + a^2*c*x^2]
*ArcTan[a*x]^2)/24 + (a^2*c*x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/6 + ((I/
8)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^3*Sqrt
[c + a^2*c*x^2]) - (41*c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/
(360*a^3) - ((I/8)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*A
rcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + ((I/8)*c^2*Sqrt[1 + a^2*x^2]*ArcT
an[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + (c^2*S
qrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(8*a^3*Sqrt[c + a^2*c*
x^2]) - (c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(8*a^3*Sqrt
[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
```

```
IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx = c\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx+\left(a^2c\right)\int x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx$$

$$= c^2\int\frac{x^2\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx+2\left(\left(a^2c^2\right)\int\frac{x^4\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx\right)+\left(a^4c^2\right)\int\frac{x^6\tan\ldots}{\sqrt{c+\ldots}}$$

$$= \frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2}+\frac{1}{6}a^2cx^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2-\frac{c^2\int\frac{\tan^{-1}(ax)\ldots}{\sqrt{c+a^2cx^2}}}{2a^2}\ldots$$

$$= -\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3}-\frac{1}{15}acx^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{cx\sqrt{c+a^2cx^2}\ldots}{2a^2}\ldots$$

$$= \frac{1}{60}cx^3\sqrt{c+a^2cx^2}-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3}+\frac{41cx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax\ldots}{180a}\ldots$$

$$= -\frac{5cx\sqrt{c+a^2cx^2}}{36a^2}+\frac{1}{60}cx^3\sqrt{c+a^2cx^2}-\frac{749c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{360a^3}+\frac{41c\ldots}{\ldots}$$

$$= -\frac{5cx\sqrt{c+a^2cx^2}}{36a^2}+\frac{1}{60}cx^3\sqrt{c+a^2cx^2}-\frac{749c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{360a^3}+\frac{41c\ldots}{\ldots}$$

$$= -\frac{5cx\sqrt{c+a^2cx^2}}{36a^2}+\frac{1}{60}cx^3\sqrt{c+a^2cx^2}-\frac{749c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{360a^3}+\frac{41c\ldots}{\ldots}$$

$$= -\frac{5cx\sqrt{c+a^2cx^2}}{36a^2}+\frac{1}{60}cx^3\sqrt{c+a^2cx^2}-\frac{749c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{360a^3}+\frac{41c\ldots}{\ldots}$$

$$= -\frac{5cx\sqrt{c+a^2cx^2}}{36a^2}+\frac{1}{60}cx^3\sqrt{c+a^2cx^2}-\frac{749c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{360a^3}+\frac{41c\ldots}{\ldots}$$

$$= -\frac{5cx\sqrt{c+a^2cx^2}}{36a^2}+\frac{1}{60}cx^3\sqrt{c+a^2cx^2}-\frac{749c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{360a^3}+\frac{41c\ldots}{\ldots}$$

Mathematica [A] time = 3.67, size = 527, normalized size = 0.99

$$\frac{c\sqrt{a^2cx^2+c}\left(960\left(-2\tanh^{-1}\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)-3i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+3i\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+3\text{Li}_3\left(-\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(960*((3*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2
- 2*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - (3*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^
(I*ArcTan[a*x])] + (3*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + 3*Po
lyLog[3, (-I)*E^(I*ArcTan[a*x])] - 3*PolyLog[3, I*E^(I*ArcTan[a*x])]) + 32*
((-45*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 19*ArcTanh[(a*x)/Sqrt[1
+ a^2*x^2]] + (45*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (45*I
)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - 45*PolyLog[3, (-I)*E^(I*Arc
Tan[a*x])] + 45*PolyLog[3, I*E^(I*ArcTan[a*x])]) + 120*(1 + a^2*x^2)^(3/2)*
(ArcTan[a*x]*(2 + 6*Sqrt[1 + a^2*x^2]*Cos[3*ArcTan[a*x]]) - 3*ArcTan[a*x]^2
*(-7*a*x + Sqrt[1 + a^2*x^2]*Sin[3*ArcTan[a*x]]) + 2*(a*x + Sqrt[1 + a^2*x^
2]*Sin[3*ArcTan[a*x]])) + (1 + a^2*x^2)^3*((-56*a*x)/Sqrt[1 + a^2*x^2] + Ar
cTan[a*x]*(12/Sqrt[1 + a^2*x^2] + 110*Cos[3*ArcTan[a*x]] - 90*Cos[5*ArcTan[
a*x]]) - 108*Sin[3*ArcTan[a*x]] - 52*Sin[5*ArcTan[a*x]] + 15*ArcTan[a*x]^2*
((78*a*x)/Sqrt[1 + a^2*x^2] - 47*Sin[3*ArcTan[a*x]] + 3*Sin[5*ArcTan[a*x]])
)))/(11520*a^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.76, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^4+cx^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^4 + c*x^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.53, size = 338, normalized size = 0.64

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(120\arctan\left(ax\right)^2x^5a^5-48\arctan\left(ax\right)x^4a^4+210\arctan\left(ax\right)^2x^3a^3+12a^3x^3-76\arctan\left(\right.\right.}{720a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x)
```

```
[Out] 1/720*c/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(120*arctan(a*x)^2*x^5*a^5-48*arctan(
a*x)*x^4*a^4+210*arctan(a*x)^2*x^3*a^3+12*a^3*x^3-76*arctan(a*x)*a^2*x^2+45
*arctan(a*x)^2*x*a+20*a*x+62*arctan(a*x))+1/720*I*c*(c*(a*x-I)*(I+a*x))^(1/
2)*(45*I*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-45*I*arctan(a*x)
^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+90*arctan(a*x)*polylog(2,I*(1+I*a*x)
/(a^2*x^2+1)^(1/2))+90*I*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-90*arctan
```

```
(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-90*I*polylog(3,-I*(1+I*a*x)
/(a^2*x^2+1)^(1/2))+164*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^3/(a^2*x^2+1
)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2+c\right)^{\frac{3}{2}}x^2\arctan\left(ax\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^2*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\mathrm{atan}^2\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(3/2)*atan(a*x)**2,x)
```

```
[Out] Integral(x**2*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2, x)
```

3.317 $\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=334

$$-\frac{3ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{20a^2\sqrt{a^2cx^2+c}}+\frac{3ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{20a^2\sqrt{a^2cx^2+c}}+\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{10a^2\sqrt{a^2cx^2+c}}+\frac{\left(a^2cx^2\right.}{30a}$$

```
[Out] 1/30*(a^2*c*x^2+c)^(3/2)/a^2-1/10*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/a+1/5*(
a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/a^2/c+3/10*I*c^2*arctan(a*x)*arctan((1+I*a
*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-3/20*I
*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a
^2*c*x^2+c)^(1/2)+3/20*I*c^2*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(
a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+3/20*c*(a^2*c*x^2+c)^(1/2)/a^2-3/2
0*c*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.23, antiderivative size = 334, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4930, 4878, 4890, 4886}

$$-\frac{3ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{20a^2\sqrt{a^2cx^2+c}}+\frac{3ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{20a^2\sqrt{a^2cx^2+c}}+\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{}}{\sqrt{}}\right.}{10a^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (3*c*Sqrt[c + a^2*c*x^2])/(20*a^2) + (c + a^2*c*x^2)^(3/2)/(30*a^2) - (3*c*
x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(20*a) - (x*(c + a^2*c*x^2)^(3/2)*ArcTan
[a*x])/(10*a) + ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/(5*a^2*c) + (((3*I)/1
0)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]
])/(a^2*Sqrt[c + a^2*c*x^2]) - (((3*I)/20)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2,
 ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c + a^2*c*x^2]) + (((3*
I)/20)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]
])/(a^2*Sqrt[c + a^2*c*x^2])
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] && !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx = \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{5a^2c} - \frac{2\int\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx}{5a}$$

$$= \frac{\left(c+a^2cx^2\right)^{3/2}}{30a^2} - \frac{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a} + \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{5a^2c} - \cdots$$

$$= \frac{3c\sqrt{c+a^2cx^2}}{20a^2} + \frac{\left(c+a^2cx^2\right)^{3/2}}{30a^2} - \frac{3cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a} - \frac{x\left(c+a^2cx^2\right.}{1\cdots}$$

$$= \frac{3c\sqrt{c+a^2cx^2}}{20a^2} + \frac{\left(c+a^2cx^2\right)^{3/2}}{30a^2} - \frac{3cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a} - \frac{x\left(c+a^2cx^2\right.}{1\cdots}$$

$$= \frac{3c\sqrt{c+a^2cx^2}}{20a^2} + \frac{\left(c+a^2cx^2\right)^{3/2}}{30a^2} - \frac{3cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a} - \frac{x\left(c+a^2cx^2\right.}{1\cdots}$$

Mathematica [A] time = 4.31, size = 601, normalized size = 1.80

$$\frac{c\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\left(80\left(-\frac{4i\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{\left(a^2x^2+1\right)^{3/2}}+\frac{4i\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{\left(a^2x^2+1\right)^{3/2}}-\frac{3\tan^{-1}(ax)\log\left(1-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}}+\frac{3\tan^{-1}(ax)\log\left(1+ie^{i\,\text{ta}\cdots}\right)}{\sqrt{a^2x^2+1}}\cdots\right.\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*(80*(2 + 4*ArcTan[a*x]^2 + 2*Cos[2*Arc
Tan[a*x]] - (3*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2]
- ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (3*ArcTan[a
*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ArcTan[a*x]*Cos[3*Arc
Tan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((4*I)*PolyLog[2, (-I)*E^(I*ArcTan
[a*x])])/(1 + a^2*x^2)^(3/2) + ((4*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 +
 a^2*x^2)^(3/2) - 2*ArcTan[a*x]*Sin[2*ArcTan[a*x]]) - (1 + a^2*x^2)*(50 - 3
2*ArcTan[a*x]^2 + 72*Cos[2*ArcTan[a*x]] + 160*ArcTan[a*x]^2*Cos[2*ArcTan[a*
x]] + 22*Cos[4*ArcTan[a*x]] - (110*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])]
)/Sqrt[1 + a^2*x^2] - 55*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcT
an[a*x])] - 11*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])]
+ (110*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + 55*Arc
Tan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] + 11*ArcTan[a*x]*C
os[5*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((176*I)*PolyLog[2, (-I)*E
^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(5/2) + ((176*I)*PolyLog[2, I*E^(I*ArcTan[
a*x])])/(1 + a^2*x^2)^(5/2) + 4*ArcTan[a*x]*Sin[2*ArcTan[a*x]] - 22*ArcTan[
a*x]*Sin[4*ArcTan[a*x]])))/(960*a^2)
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^3+cx\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^3 + c*x)*sqrt(a^2*c*x^2 + c)*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.06, size = 237, normalized size = 0.71

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(12\arctan\left(ax\right)^{2}x^{4}a^{4}-6\arctan\left(ax\right)x^{3}a^{3}+24\arctan\left(ax\right)^{2}x^{2}a^{2}+2a^{2}x^{2}-15\arctan\left(ax\right)x}{60a^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x)
```

```
[Out] 1/60*c/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(12*arctan(a*x)^2*x^4*a^4-6*arctan(a*x
)*x^3*a^3+24*arctan(a*x)^2*x^2*a^2+2*a^2*x^2-15*arctan(a*x)*x*a+12*arctan(a
*x)^2+11)+3/20*c*(c*(a*x-I)*(I+a*x))^(1/2)*(I*dilog(1-I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))+arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(1-
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^
2/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}x\arctan\left(ax\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}\left(a\,x\right)^{2}\,\left(c\,a^{2}\,x^{2}+c\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^2*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x*atan(a*x)^2*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^{2}\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)*atan(a*x)**2,x)
```

```
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2, x)
```

3.318 $\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=438

$$\frac{5c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{a^2cx^2+c}}\right)}{6a}+\frac{3ic^2\sqrt{a^2x^2+1}\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{4a\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\tan^{-1}(ax)\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{4a\sqrt{a^2cx^2+c}}$$

```
[Out] -1/6*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/a+1/4*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x
)^2+5/6*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a-3/4*I*c^2*arctan
((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+
c)^(1/2)+3/4*I*c^2*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a
^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3/4*I*c^2*arctan(a*x)*polylog(2,I*(1+
I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3/4*c^2*p
olylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^
(1/2)+3/4*c^2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/
(a^2*c*x^2+c)^(1/2)+1/12*c*x*(a^2*c*x^2+c)^(1/2)-3/4*c*arctan(a*x)*(a^2*c*x
^2+c)^(1/2)/a+3/8*c*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.31, antiderivative size = 438, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4880, 4890, 4888, 4181, 2531, 2282, 6589, 217, 206, 195}

$$\frac{3ic^2\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{4a\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{4a\sqrt{a^2cx^2+c}}-\frac{3c^2\sqrt{a^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*x*Sqrt[c + a^2*c*x^2])/12 - (3*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(4*a)
- ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/(6*a) + (3*c*x*Sqrt[c + a^2*c*x^2]*Ar
cTan[a*x]^2)/8 + (x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/4 - (((3*I)/4)*c^2
*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a*Sqrt[c + a^2
*c*x^2]) + (5*c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(6*a) + (
((3*I)/4)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x
])])/(a*Sqrt[c + a^2*c*x^2]) - (((3*I)/4)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]
*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - (3*c^2*Sqrt[1 +
 a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(4*a*Sqrt[c + a^2*c*x^2]) + (
3*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(4*a*Sqrt[c + a^2*
c*x^2])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2\,dx = -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{1}{4}x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2 + \frac{1}{6}c\int \sqrt{c+a^2cx}$$

$$= \frac{1}{12}cx\sqrt{c+a^2cx^2} - \frac{3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{4a} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{3}{8}c$$

$$= \frac{1}{12}cx\sqrt{c+a^2cx^2} - \frac{3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{4a} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{3}{8}c$$

$$= \frac{1}{12}cx\sqrt{c+a^2cx^2} - \frac{3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{4a} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{3}{8}c$$

$$= \frac{1}{12}cx\sqrt{c+a^2cx^2} - \frac{3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{4a} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{3}{8}c$$

$$= \frac{1}{12}cx\sqrt{c+a^2cx^2} - \frac{3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{4a} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{3}{8}c$$

$$= \frac{1}{12}cx\sqrt{c+a^2cx^2} - \frac{3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{4a} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{3}{8}c$$

$$= \frac{1}{12}cx\sqrt{c+a^2cx^2} - \frac{3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{4a} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{6a} + \frac{3}{8}c$$

Mathematica [A] time = 0.98, size = 439, normalized size = 1.00

$$\frac{c\sqrt{a^2cx^2+c}\left(2a^4x^4\sin\left(3\tan^{-1}(ax)\right) - 3a^4x^4\tan^{-1}(ax)^2\sin\left(3\tan^{-1}(ax)\right) + 6a^4x^4\tan^{-1}(ax)\cos\left(3\tan^{-1}(ax)\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(2*a*x*Sqrt[1 + a^2*x^2] + 2*a^3*x^3*Sqrt[1 + a^2*x^
2] - 94*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + 2*a^2*x^2*Sqrt[1 + a^2*x^2]*ArcTan[
a*x] + 69*a*x*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + 21*a^3*x^3*Sqrt[1 + a^2*x^2
]*ArcTan[a*x]^2 - (72*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 80*ArcTa
nh[(a*x)/Sqrt[1 + a^2*x^2]] + 6*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 12*a^2*x^2
*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 6*a^4*x^4*ArcTan[a*x]*Cos[3*ArcTan[a*x]]
+ (72*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (72*I)*ArcTan[a*x
]*PolyLog[2, I*E^(I*ArcTan[a*x])] - 72*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] +
 72*PolyLog[3, I*E^(I*ArcTan[a*x])] + 2*Sin[3*ArcTan[a*x]] + 4*a^2*x^2*Sin[
3*ArcTan[a*x]] + 2*a^4*x^4*Sin[3*ArcTan[a*x]] - 3*ArcTan[a*x]^2*Sin[3*ArcTa
n[a*x]] - 6*a^2*x^2*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] - 3*a^4*x^4*ArcTan[a*x
]^2*Sin[3*ArcTan[a*x]]))/(96*a*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.71, size = 304, normalized size = 0.69

$$\frac{c\sqrt{c\,(ax-i)\,(ax+i)}\,\left(6\arctan(ax)^2x^3a^3-4\arctan(ax)\,a^2x^2+15\arctan(ax)^2\,xa+2ax-22\arctan(ax)\right)}{24a}-\frac{ic\sqrt{c}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x)
```

```
[Out] 1/24*c/a*(c*(a*x-I)*(I+a*x))^(1/2)*(6*arctan(a*x)^2*x^3*a^3-4*arctan(a*x)*a
^2*x^2+15*arctan(a*x)^2*x*a+2*a*x-22*arctan(a*x))-1/24*I*c*(c*(a*x-I)*(I+a*
x))^(1/2)*(9*I*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-9*I*arctan
(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+18*I*polylog(3,I*(1+I*a*x)/(a^2
*x^2+1)^(1/2))-18*I*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+18*arctan(a*x
)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-18*arctan(a*x)*polylog(2,-I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))+40*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)))/a/(a^2*x^2
+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan(ax)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}(a\,x)^2\left(c\,a^2\,x^2+c\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^2*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\mathrm{atan}^2(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**2,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2, x)
```

3.319 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x}\,dx$

Optimal. Leaf size=530

$$-\frac{7ic^2\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{7ic^2\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{2ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{2ic^2}{}$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2+14/3*I*c^2*arctan(a*x)*arctan((1+I*a*
x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*c^2*arcta
n(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+
c)^(1/2)+2*I*c^2*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x
^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*c^2*arctan(a*x)*polylog(2,(1+I*a*x)/(a^
2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-7/3*I*c^2*polylog(2,-
I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+7/
3*I*c^2*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)-2*c^2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(
1/2)/(a^2*c*x^2+c)^(1/2)+2*c^2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*
x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+1/3*c*(a^2*c*x^2+c)^(1/2)-1/3*a*c*x*arctan
(a*x)*(a^2*c*x^2+c)^(1/2)+c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.88, antiderivative size = 530, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4950, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4890, 4886, 4878}

$$-\frac{7ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{7ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{2ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyL}}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2])/3 - (a*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/3 + c*S
qrt[c + a^2*c*x^2]*ArcTan[a*x]^2 + ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/3
+ (((14*I)/3)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt
[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*
ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((2*I)*c^2*Sqrt[1 + a^2*x
^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((2*I
)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c +
 a^2*c*x^2] - (((7*I)/3)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*
a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] + (((7*I)/3)*c^2*Sqrt[1 + a^2*x
^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] -
(2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2
] + (2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*
x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
```

```
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
```

```
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x}\,dx + \left(a^2c\right)\int x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2\,dx$$

$$= \frac{1}{3}\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2 - \frac{1}{3}(2ac)\int \sqrt{c+a^2cx^2}\tan^{-1}(ax)\,dx + c^2\int \frac{\text{ta}}{x\sqrt{}}$$

$$= \frac{1}{3}c\sqrt{c+a^2cx^2} - \frac{1}{3}acx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{1}{3}$$

$$= \frac{1}{3}c\sqrt{c+a^2cx^2} - \frac{1}{3}acx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{1}{3}$$

$$= \frac{1}{3}c\sqrt{c+a^2cx^2} - \frac{1}{3}acx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{1}{3}$$

$$= \frac{1}{3}c\sqrt{c+a^2cx^2} - \frac{1}{3}acx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{1}{3}$$

$$= \frac{1}{3}c\sqrt{c+a^2cx^2} - \frac{1}{3}acx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{1}{3}$$

$$= \frac{1}{3}c\sqrt{c+a^2cx^2} - \frac{1}{3}acx\sqrt{c+a^2cx^2}\tan^{-1}(ax) + c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2 + \frac{1}{3}$$

Mathematica [A] time = 3.39, size = 496, normalized size = 0.94

$$\frac{1}{12}c\sqrt{a^2cx^2+c}\left(\frac{12\left(\sqrt{a^2x^2+1}\tan^{-1}(ax)^2 + 2i\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - 2i\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right) - 2i\text{L}\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*((12*(Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + ArcTan[a*x]^
2*Log[1 - E^(I*ArcTan[a*x])] - 2*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])] +
 2*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] - ArcTan[a*x]^2*Log[1 + E^(I*Ar
cTan[a*x])] + (2*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] - (2*I)*Poly
```

```
Log[2, (-I)*E^(I*ArcTan[a*x])] + (2*I)*PolyLog[2, I*E^(I*ArcTan[a*x])] - (2
*I)*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] - 2*PolyLog[3, -E^(I*ArcTan[a
*x])] + 2*PolyLog[3, E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] + (1 + a^2*x^2)
*(2 + 4*ArcTan[a*x]^2 + 2*Cos[2*ArcTan[a*x]] - (3*ArcTan[a*x]*Log[1 - I*E^(
I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 -
 I*E^(I*ArcTan[a*x])] + (3*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1
 + a^2*x^2] + ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] -
 ((4*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3/2) + ((4*I)*Po
lyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3/2) - 2*ArcTan[a*x]*Sin[2*Ar
cTan[a*x]])))/12
```

fricas [F] time = 1.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.89, size = 365, normalized size = 0.69

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(\arctan\left(ax\right)^2x^2a^2-\arctan\left(ax\right)xa+4\arctan\left(ax\right)^2+1\right)}{3}-\frac{ic\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(3i\arctan\left(\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x,x)
```

```
[Out] 1/3*c*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)^2*x^2*a^2-arctan(a*x)*x*a+4*ar
ctan(a*x)^2+1)-1/3*I*c*(c*(a*x-I)*(I+a*x))^(1/2)*(3*I*arctan(a*x)^2*ln(1-(1
+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/
2))+7*I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-7*I*arctan(a*x)*ln(
1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2
+1)^(1/2))+6*I*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*arctan(a*x)*polylog
(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)+7*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-7*dilog(1-I*(1+I*a*x)/(a^2*x^2+1
)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x,x)
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^{2}{\left(ax\right)}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**2/x,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2/x, x)
```

3.320 $\int \frac{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2}{x^2} \, dx$

Optimal. Leaf size=556

$$ac^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)+\frac{2iac^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{3iac^2\sqrt{a^2x^2+1}\,\tan^{-1}}{\sqrt{a^2cx}}$$

```
[Out] a*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))-3*I*a*c^2*arctan((1+I*a*
x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-4
*a*c^2*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/
2)/(a^2*c*x^2+c)^(1/2)+3*I*a*c^2*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^
2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a*c^2*arctan(a*x)*pol
ylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
+2*I*a*c^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a
^2*c*x^2+c)^(1/2)-2*I*a*c^2*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2
*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*a*c^2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*a*c^2*polylog(3,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a*c*arctan(a*x)*
(a^2*c*x^2+c)^(1/2)-c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x+1/2*a^2*c*x*arcta
n(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.97, antiderivative size = 556, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 13, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.542, Rules used = {4950, 4944, 4958, 4954, 4890, 4888, 4181, 2531, 2282, 6589, 4880, 217, 206}

$$\frac{2iac^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{3iac^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLo}}{\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] -(a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) - (c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
^2)/x + (a^2*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/2 - ((3*I)*a*c^2*Sqrt[1
 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2] -
(4*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a
*x]])/Sqrt[c + a^2*c*x^2] + a*c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*
x^2]] + ((3*I)*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*Arc
Tan[a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x
]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((2*I)*a*c^2*Sqrt[
1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c
*x^2] - ((2*I)*a*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 -
I*a*x]])/Sqrt[c + a^2*c*x^2] - (3*a*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E
^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (3*a*c^2*Sqrt[1 + a^2*x^2]*PolyLog
[3, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^2}\,dx &= c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^2}\,dx+\left(a^2c\right)\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx\\
&= -ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)+\frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2+c^2\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\\
&= -ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}+\frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}\\
&= -ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}+\frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}\\
&= -ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}+\frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}\\
&= -ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}+\frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}\\
&= -ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}+\frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}\\
&= -ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}+\frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}
\end{aligned}$$

Mathematica [A] time = 1.09, size = 376, normalized size = 0.68

$$\frac{c\sqrt{a^2cx^2+c}\left(a^2x^2\sqrt{a^2x^2+1}\tan^{-1}(ax)^2-2\sqrt{a^2x^2+1}\tan^{-1}(ax)^2-2ax\sqrt{a^2x^2+1}\tan^{-1}(ax)+2ax\tanh^{-1}\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(-2*a*x*Sqrt[1 + a^2*x^2]*ArcTan[a*x] - 2*Sqrt[1 + a
^2*x^2]*ArcTan[a*x]^2 + a^2*x^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 - (2*I)*a*x
*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 2*a*x*ArcTanh[(a*x)/Sqrt[1 + a^2
*x^2]] + 4*a*x*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] + 2*a*x*ArcTan[a*x]^2
*Log[1 - I*E^(I*ArcTan[a*x])] - 2*a*x*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a
*x])] - 4*a*x*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] + (4*I)*a*x*PolyLog[2,
 -E^(I*ArcTan[a*x])] + (6*I)*a*x*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*
x])] - (6*I)*a*x*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - (4*I)*a*x*Po
lyLog[2, E^(I*ArcTan[a*x])] - 6*a*x*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 6*
a*x*PolyLog[3, I*E^(I*ArcTan[a*x])]))/(2*x*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 1.99, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan(ax)^2}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.87, size = 356, normalized size = 0.64

$$\frac{c\sqrt{c(ax-i)(ax+i)}\arctan(ax)\left(\arctan(ax)a^2x^2-2ax-2\arctan(ax)\right)}{2x}-\frac{iac\sqrt{c(ax-i)(ax+i)}\left(3i\arctan(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^2,x)
```

```
[Out] 1/2*c*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(arctan(a*x)*a^2*x^2-2*a*x-2*ar
ctan(a*x))/x-1/2*I*a*c*(c*(a*x-I)*(I+a*x))^(1/2)*(3*I*arctan(a*x)^2*ln(1-I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))-4*I*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*arctan(a*x)*pol
ylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))-6*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*polylog
(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+4*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))-4*
```

```
dilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-4*dilog((1+I*a*x)/(a^2*x^2+1)^(1/2)))/
(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x^2,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^2\left(ax\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**2/x**2,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2/x**2, x)
```

3.321 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^3}\,dx$

Optimal. Leaf size=567

$$-a^2c^{3/2}\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)-\frac{2ia^2c^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2ia^2c^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{3ia^2c^2\sqrt{a^2x^2}}{}$$

```
[Out] -a^2*c^(3/2)*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))+4*I*a^2*c^2*arctan(a*x)*a
rctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2
)-3*a^2*c^2*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^
(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*a^2*c^2*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2
*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^2*c^2*arctan(a*x
)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1
/2)-2*I*a^2*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(
1/2)/(a^2*c*x^2+c)^(1/2)+2*I*a^2*c^2*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^
(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*a^2*c^2*polylog(3,-(1+I*a*x)
/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*a^2*c^2*polylog
(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a*c*a
rctan(a*x)*(a^2*c*x^2+c)^(1/2)/x+a^2*c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)-1/
2*c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 1.65, antiderivative size = 567, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 15, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4950, 4962, 4944, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4890, 4886}

$$-\frac{2ia^2c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{2ia^2c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{3ia^2c^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax}{\sqrt{a^2cx}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] -((a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x) + a^2*c*Sqrt[c + a^2*c*x^2]*ArcT
an[a*x]^2 - (c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*x^2) + ((4*I)*a^2*c^2*
Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt
[c + a^2*c*x^2] - (3*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*A
rcTan[a*x])])/Sqrt[c + a^2*c*x^2] - a^2*c^(3/2)*ArcTanh[Sqrt[c + a^2*c*x^2]
/Sqrt[c]] + ((3*I)*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*A
rcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan
[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((2*I)*a^2*c^2*S
qrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c
 + a^2*c*x^2] + ((2*I)*a^2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a
*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (3*a^2*c^2*Sqrt[1 + a^2*x^2]*P
olyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (3*a^2*c^2*Sqrt[1 + a^
2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^3}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^3}\,dx + \left(a^2c\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}\,dx$$

$$= c^2\int \frac{\tan^{-1}(ax)^2}{x^3\sqrt{c+a^2cx^2}}\,dx + 2\left(\left(a^2c^2\right)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx\right) + \left(a^4c^2\right)\int \frac{x\tan^{-1}(ax}{\sqrt{c+a^2cx^2}}$$

$$= a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} + \left(ac^2\right)\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(a}{2x^2}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(a}{2x^2}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(a}{2x^2}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(a}{2x^2}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(a}{2x^2}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} + a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(a}{2x^2}$$

Mathematica [A] time = 3.19, size = 455, normalized size = 0.80

$$\frac{a^2c\sqrt{a^2cx^2+c}\,\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)\left(24i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)\cot\left(\frac{1}{2}\tan^{-1}(ax)\right) - 24i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] (a^2*c*Sqrt[c + a^2*c*x^2]*(-4*ArcTan[a*x] - 4*ArcTan[a*x]*Cot[ArcTan[a*x]/
2]^2 + 4*a*x*ArcTan[a*x]^2*Csc[ArcTan[a*x]/2]^2 - ArcTan[a*x]^2*Cot[ArcTan[
a*x]/2]*Csc[ArcTan[a*x]/2]^2 + 12*ArcTan[a*x]^2*Cot[ArcTan[a*x]/2]*Log[1 -
E^(I*ArcTan[a*x])] - 16*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Log[1 - I*E^(I*ArcTa
n[a*x])] + 16*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Log[1 + I*E^(I*ArcTan[a*x])] -
 12*ArcTan[a*x]^2*Cot[ArcTan[a*x]/2]*Log[1 + E^(I*ArcTan[a*x])] + 8*Cot[Arc
Tan[a*x]/2]*Log[Tan[ArcTan[a*x]/2]] + (24*I)*ArcTan[a*x]*Cot[ArcTan[a*x]/2]
*PolyLog[2, -E^(I*ArcTan[a*x])] - (16*I)*Cot[ArcTan[a*x]/2]*PolyLog[2, (-I)
*E^(I*ArcTan[a*x])] + (16*I)*Cot[ArcTan[a*x]/2]*PolyLog[2, I*E^(I*ArcTan[a*
x])] - (24*I)*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*PolyLog[2, E^(I*ArcTan[a*x])]
- 24*Cot[ArcTan[a*x]/2]*PolyLog[3, -E^(I*ArcTan[a*x])] + 24*Cot[ArcTan[a*x]
/2]*PolyLog[3, E^(I*ArcTan[a*x])] + ArcTan[a*x]^2*Csc[ArcTan[a*x]/2]*Sec[Ar
cTan[a*x]/2])*Tan[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 2.00, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.35, size = 412, normalized size = 0.73

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \arctan\left(ax\right)\left(2\arctan\left(ax\right)a^2x^2-2ax-\arctan\left(ax\right)\right)}{2x^2}-\frac{a^2c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(-6i\arctan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^3,x)
```

```
[Out] 1/2*c*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(2*arctan(a*x)*a^2*x^2-2*a*x-ar
ctan(a*x))/x^2-1/2*a^2*c*(c*(a*x-I)*(I+a*x))^(1/2)*(-6*I*arctan(a*x)*polylo
g(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*
x^2+1)^(1/2))+3*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*
x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+4*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))-4*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-4*arctan(a*x)*ln(1+I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))+4*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-
2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)+6*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2
))-6*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1
/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x^3,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x^3, x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}} \operatorname{atan}^2\left(ax\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**2/x**3,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2/x**3, x)
```

3.322 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^4}\,dx$

Optimal. Leaf size=579

$$-\frac{a^2c\sqrt{a^2cx^2+c}}{3x}-\frac{a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{x}-\frac{ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3x^2}-\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^2}{3x^3}+\frac{7ia^3c^2\sqrt{a^2}}{3}$$

```
[Out] -1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^3-2*I*a^3*c^2*arctan((1+I*a*x)/(a^
2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-14/3*a^
3*c^2*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2
)/(a^2*c*x^2+c)^(1/2)+2*I*a^3*c^2*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x
^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*a^3*c^2*arctan(a*x)*
polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1
/2)+7/3*I*a^3*c^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(
1/2)/(a^2*c*x^2+c)^(1/2)-7/3*I*a^3*c^2*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^
(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*a^3*c^2*polylog(3,-I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*a^3*c^2*polyl
og(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1
/3*a^2*c*(a^2*c*x^2+c)^(1/2)/x-1/3*a*c*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x^2-
a^2*c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x
```

Rubi [A] time = 1.15, antiderivative size = 579, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.542, Rules used = {4950, 4944, 4946, 4962, 264, 4958, 4954, 4890, 4888, 4181, 2531, 2282, 6589}

$$\frac{7ia^3c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}-\frac{7ia^3c^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{2ia^3c^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Po}}{\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -(a^2*c*Sqrt[c + a^2*c*x^2])/(3*x) - (a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/
(3*x^2) - (a^2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/x - ((c + a^2*c*x^2)^(3
/2)*ArcTan[a*x]^2)/(3*x^3) - ((2*I)*a^3*c^2*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*A
rcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2] - (14*a^3*c^2*Sqrt[1 + a^2*
x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(3*Sqrt[c + a^2*
c*x^2]) + ((2*I)*a^3*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I
*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((2*I)*a^3*c^2*Sqrt[1 + a^2*x^2]*ArcT
an[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (((7*I)/3)*a
^3*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sq
rt[c + a^2*c*x^2] - (((7*I)/3)*a^3*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1
+ I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (2*a^3*c^2*Sqrt[1 + a^2*x^
2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (2*a^3*c^2*Sqr
t[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
```

```
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
```

```
IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^4}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^4}\,dx + \left(a^2c\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^2}\,dx$$

$$= -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{3x^3} + \frac{1}{3}(2ac)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x^3}\,dx + \left(a^2c^2\right)\int -$$

$$= -\frac{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}}{3x^3}$$

$$= -\frac{2a^2c\sqrt{c+a^2cx^2}}{3x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x} - \frac{(c}{}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}}{3x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x} - \frac{(c}{}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}}{3x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x} - \frac{(c}{}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}}{3x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x} - \frac{(c}{}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}}{3x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x} - \frac{(c}{}$$

Mathematica [A] time = 7.38, size = 537, normalized size = 0.93

$$\frac{a^3c^2\sqrt{a^2x^2+1}\left(8i\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - \frac{2\left(a^2x^2+1\right)^{3/2}\left(-\frac{3ax\tan^{-1}(ax)\log\left(1-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + \frac{3ax\tan^{-1}(ax)\log\left(1+e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + \frac{4ia^3x^3\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\left(a^2x^2+1\right)^{3/2}} + \cdots\right.}{\cdots}\right.}{24\sqrt{\cdots}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -((a^3*c*Sqrt[c*(1 + a^2*x^2)]*((Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2)/(a*x) - 2
*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] - ArcTan[a*x]^2*Log[1 - I*E^(I*ArcT
an[a*x])] + ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] + 2*ArcTan[a*x]*Log[
1 + E^(I*ArcTan[a*x])] - (2*I)*PolyLog[2, -E^(I*ArcTan[a*x])] - (2*I)*ArcTa
n[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (2*I)*ArcTan[a*x]*PolyLog[2, I*
E^(I*ArcTan[a*x])] + (2*I)*PolyLog[2, E^(I*ArcTan[a*x])] + 2*PolyLog[3, (-I
)*E^(I*ArcTan[a*x])] - 2*PolyLog[3, I*E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2
]) + (a^3*c^2*Sqrt[1 + a^2*x^2]*((8*I)*PolyLog[2, -E^(I*ArcTan[a*x])] - (2*
(1 + a^2*x^2)^(3/2)*(2 + 4*ArcTan[a*x]^2 - 2*Cos[2*ArcTan[a*x]] - (3*a*x*Ar
cTan[a*x]*Log[1 - E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (3*a*x*ArcTan[a*x
]*Log[1 + E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((4*I)*a^3*x^3*PolyLog[2,
 E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3/2) + 2*ArcTan[a*x]*Sin[2*ArcTan[a*x]]
 + ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])]*Sin[3*ArcTan[a*x]] - ArcTan[a*x]*
Log[1 + E^(I*ArcTan[a*x])]*Sin[3*ArcTan[a*x]]))/(a^3*x^3)))/(24*Sqrt[c*(1 +
 a^2*x^2)])
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.96, size = 343, normalized size = 0.59

$$-\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(4\arctan\left(ax\right)^2x^2a^2+a^2x^2+\arctan\left(ax\right)xa+\arctan\left(ax\right)^2\right)}{3x^3}+\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(-6i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^4,x)
```

```
[Out] -1/3*c*(c*(a*x-I)*(I+a*x))^(1/2)*(4*arctan(a*x)^2*x^2*a^2+a^2*x^2+arctan(a*
x)*x*a+arctan(a*x)^2)/x^3+1/3*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)*(
-6*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan(a*x)*p
olylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))-3*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+7*I*d
ilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+7*I*dilog((1+I*a*x)/(a^2*x^2+1)^(1/2))-
7*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(3,I*(1+I*a*x)/(a^
2*x^2+1)^(1/2))-6*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*c*a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^4,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2/x^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x^4,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(3/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^2(ax)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**2/x**4,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2/x**4, x)
```

3.323 $\int x^3 \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=578

$$\frac{c^2x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{63a^2}+\frac{19}{63}a^2c^2x^6\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2-\frac{103ac^2x^5\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{1512}+\frac{5}{21}c^2x^4\sqrt{a^2cx^2}$$

```
[Out] -115/18144*c*(a^2*c*x^2+c)^(3/2)/a^4-23/7560*(a^2*c*x^2+c)^(5/2)/a^4+1/252*
(a^2*c*x^2+c)^(7/2)/a^4/c-115/4032*I*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a
*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+115/4032*I*c^3*polylog
(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^
(1/2)-115/2016*I*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a
^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-115/4032*c^2*(a^2*c*x^2+c)^(1/2)/a^
4+47/1344*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^3-205/6048*c^2*x^3*arctan
(a*x)*(a^2*c*x^2+c)^(1/2)/a-103/1512*a*c^2*x^5*arctan(a*x)*(a^2*c*x^2+c)^(1
/2)-1/36*a^3*c^2*x^7*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-2/63*c^2*arctan(a*x)^2
*(a^2*c*x^2+c)^(1/2)/a^4+1/63*c^2*x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^2
+5/21*c^2*x^4*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)+19/63*a^2*c^2*x^6*arctan(a*
x)^2*(a^2*c*x^2+c)^(1/2)+1/9*a^4*c^2*x^8*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 10.70, antiderivative size = 578, normalized size of antiderivative = 1.00, number of steps used = 203, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4950, 4952, 261, 4890, 4886, 4930, 266, 43}

$$\frac{115ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{4032a^4\sqrt{a^2cx^2+c}}-\frac{115ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{4032a^4\sqrt{a^2cx^2+c}}-\frac{115c^2\sqrt{a^2cx^2+c}}{4032a^4}+\frac{1}{9}a^4c^2x^8$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] (-115*c^2*Sqrt[c + a^2*c*x^2])/(4032*a^4) - (115*c*(c + a^2*c*x^2)^(3/2))/(
18144*a^4) - (23*(c + a^2*c*x^2)^(5/2))/(7560*a^4) + (c + a^2*c*x^2)^(7/2)/
(252*a^4*c) + (47*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(1344*a^3) - (205*
c^2*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(6048*a) - (103*a*c^2*x^5*Sqrt[c +
 a^2*c*x^2]*ArcTan[a*x])/1512 - (a^3*c^2*x^7*Sqrt[c + a^2*c*x^2]*ArcTan[a*x
])/36 - (2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(63*a^4) + (c^2*x^2*Sqrt[
c + a^2*c*x^2]*ArcTan[a*x]^2)/(63*a^2) + (5*c^2*x^4*Sqrt[c + a^2*c*x^2]*Arc
Tan[a*x]^2)/21 + (19*a^2*c^2*x^6*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/63 + (a
^4*c^2*x^8*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/9 - (((115*I)/2016)*c^3*Sqrt[
1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^4*Sqrt
[c + a^2*c*x^2]) + (((115*I)/4032)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*S
qrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^2*c*x^2]) - (((115*I)/403
2)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(
a^4*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2\,dx = c\int x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx+\left(a^2c\right)\int x^5\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2$$

$$= c^2\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx+2\left(\left(a^2c^2\right)\int x^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\right.$$

$$= c^3\int\frac{x^3\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx+\left(a^2c^3\right)\int\frac{x^5\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx+\left(a^4c^3\right)\int\frac{x^7\tan^{-1}(}{\sqrt{c+a^2c}}$$

$$= \frac{c^2x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3a^2}+\frac{1}{5}c^2x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2+\frac{1}{7}a^2c^2x^6\sqrt{c}$$

$$= -\frac{c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^3}-\frac{c^2x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{10a}-\frac{1}{21}ac^2x^5\sqrt{c+a}$$

$$= \frac{c^2\sqrt{c+a^2cx^2}}{3a^4}+\frac{c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^3}+\frac{19c^2x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{420a}$$

$$= -\frac{c^2\sqrt{c+a^2cx^2}}{12a^4}-\frac{61c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{168a^3}-\frac{3761c^2x^3\sqrt{c+a^2cx^2}\,\tan}{30240a}$$

$$= \frac{713c^2\sqrt{c+a^2cx^2}}{2520a^4}+\frac{37c\left(c+a^2cx^2\right)^{3/2}}{1260a^4}-\frac{\left(c+a^2cx^2\right)^{5/2}}{140a^4}+\frac{\left(c+a^2cx^2\right)^{7/2}}{252a^4c}$$

$$= -\frac{6299c^2\sqrt{c+a^2cx^2}}{60480a^4}+\frac{349c\left(c+a^2cx^2\right)^{3/2}}{11340a^4}-\frac{167\left(c+a^2cx^2\right)^{5/2}}{7560a^4}+\frac{\left(c+a^2\right.}{252}$$

$$= -\frac{5519c^2\sqrt{c+a^2cx^2}}{20160a^4}+\frac{7921c\left(c+a^2cx^2\right)^{3/2}}{90720a^4}-\frac{167\left(c+a^2cx^2\right)^{5/2}}{7560a^4}+\frac{\left(c+a\right.}{25}$$

Mathematica [B] time = 8.76, size = 1320, normalized size = 2.28

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] ((c + a^2*c*x^2)^(5/2)*(-48384*(50 - 32*ArcTan[a*x]^2 + 72*Cos[2*ArcTan[a*x
]] + 160*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 22*Cos[4*ArcTan[a*x]] - (110*Ar
cTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 55*ArcTan[a*x]*
Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 11*ArcTan[a*x]*Cos[5*ArcT
an[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (110*ArcTan[a*x]*Log[1 + I*E^(I*Arc
Tan[a*x])])/Sqrt[1 + a^2*x^2] + 55*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 + I
*E^(I*ArcTan[a*x])] + 11*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 + I*E^(I*ArcT
an[a*x])] - ((176*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(5/2
) + ((176*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(5/2) + 4*ArcTa
n[a*x]*Sin[2*ArcTan[a*x]] - 22*ArcTan[a*x]*Sin[4*ArcTan[a*x]]) + 576*(1 + a
^2*x^2)*(4116 + 10944*ArcTan[a*x]^2 + 6262*Cos[2*ArcTan[a*x]] - 5376*ArcTan
[a*x]^2*Cos[2*ArcTan[a*x]] + 2764*Cos[4*ArcTan[a*x]] + 6720*ArcTan[a*x]^2*C
os[4*ArcTan[a*x]] + 618*Cos[6*ArcTan[a*x]] - (10815*ArcTan[a*x]*Log[1 - I*E
^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 6489*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*
Log[1 - I*E^(I*ArcTan[a*x])] - 2163*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 -
```

```
I*E^(I*ArcTan[a*x])] - 309*ArcTan[a*x]*Cos[7*ArcTan[a*x]]*Log[1 - I*E^(I*Ar
cTan[a*x])] + (10815*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2
*x^2] + 6489*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] +
2163*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] + 309*ArcT
an[a*x]*Cos[7*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((19776*I)*PolyLo
g[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(7/2) + ((19776*I)*PolyLog[2, I
*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(7/2) - 1266*ArcTan[a*x]*Sin[2*ArcTan[a*
x]] + 360*ArcTan[a*x]*Sin[4*ArcTan[a*x]] - 618*ArcTan[a*x]*Sin[6*ArcTan[a*x
]]) - (1 + a^2*x^2)^2*(657578 - 820224*ArcTan[a*x]^2 + 1083168*Cos[2*ArcTan
[a*x]] + 3276288*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 576936*Cos[4*ArcTan[a*x
]] - 580608*ArcTan[a*x]^2*Cos[4*ArcTan[a*x]] + 184160*Cos[6*ArcTan[a*x]] +
483840*ArcTan[a*x]^2*Cos[6*ArcTan[a*x]] + 32814*Cos[8*ArcTan[a*x]] - (20672
82*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 1378188*Ar
cTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 590652*ArcTan[a
*x]*Cos[5*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 147663*ArcTan[a*x]*Co
s[7*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 16407*ArcTan[a*x]*Cos[9*Arc
Tan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (2067282*ArcTan[a*x]*Log[1 + I*E^(
I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + 1378188*ArcTan[a*x]*Cos[3*ArcTan[a*x]]
*Log[1 + I*E^(I*ArcTan[a*x])] + 590652*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1
 + I*E^(I*ArcTan[a*x])] + 147663*ArcTan[a*x]*Cos[7*ArcTan[a*x]]*Log[1 + I*E
^(I*ArcTan[a*x])] + 16407*ArcTan[a*x]*Cos[9*ArcTan[a*x]]*Log[1 + I*E^(I*Arc
Tan[a*x])] - ((4200192*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)
^(9/2) + ((4200192*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(9/2)
+ 78444*ArcTan[a*x]*Sin[2*ArcTan[a*x]] - 160452*ArcTan[a*x]*Sin[4*ArcTan[a*
x]] + 38172*ArcTan[a*x]*Sin[6*ArcTan[a*x]] - 32814*ArcTan[a*x]*Sin[8*ArcTan
[a*x]])))/(46448640*a^4)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^7+2\,a^2c^2x^5+c^2x^3\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3)*sqrt(a^2*c*x^2 + c)*arctan
(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.64, size = 309, normalized size = 0.53

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(20160\arctan\left(ax\right)^2x^8a^8-5040\arctan\left(ax\right)x^7a^7+54720\arctan\left(ax\right)^2x^6a^6+720a^6x^6-1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x)
```

```
[Out] 1/181440*c^2/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(20160*arctan(a*x)^2*x^8*a^8-504
0*arctan(a*x)*x^7*a^7+54720*arctan(a*x)^2*x^6*a^6+720*a^6*x^6-12360*arctan(
```

```
a*x)*x^5*a^5+43200*arctan(a*x)^2*x^4*a^4+1608*a^4*x^4-6150*arctan(a*x)*x^3*
a^3+2880*arctan(a*x)^2*x^2*a^2-94*a^2*x^2+6345*arctan(a*x)*x*a-5760*arctan(
a*x)^2-6157)-115/4032*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(I*dilog(1-I*(1+I*a*x)/
(a^2*x^2+1)^(1/2))+arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a
*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(
1/2)))/a^4/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2+c\right)^{\frac{5}{2}}x^3 \arctan\left(ax\right)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^3*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\, \mathrm{atan}\left(a\,x\right)^2\, {\left(c\,a^2\,x^2+c\right)}^{5/2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(5/2),x)
[Out] int(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^{2}{\left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**(5/2)*atan(a*x)**2,x)
[Out] Integral(x**3*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2, x)
```

3.324 $\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=638

$$\frac{43c^2x\sqrt{a^2cx^2+c}}{4032a^2}-\frac{737c^2x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{10080a}+\frac{5c^2x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{128a^2}+\frac{1}{168}a^2c^2x^5\sqrt{a^2cx^2+c}+\frac{17}{48}a^2c^2x$$

```
[Out] -397/5040*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^3+5/64*I*c^3*a
rctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(
a^2*c*x^2+c)^(1/2)+5/64*I*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*
x)^2*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-5/64*I*c^3*arctan(a*x)*polyl
og(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1
/2)+5/64*c^3*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^
3/(a^2*c*x^2+c)^(1/2)-5/64*c^3*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^
2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+43/4032*c^2*x*(a^2*c*x^2+c)^(1/2)/a^
2+29/1680*c^2*x^3*(a^2*c*x^2+c)^(1/2)+1/168*a^2*c^2*x^5*(a^2*c*x^2+c)^(1/2)
+1373/20160*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^3-737/10080*c^2*x^2*arcta
n(a*x)*(a^2*c*x^2+c)^(1/2)/a-83/840*a*c^2*x^4*arctan(a*x)*(a^2*c*x^2+c)^(1/
2)-1/28*a^3*c^2*x^6*arctan(a*x)*(a^2*c*x^2+c)^(1/2)+5/128*c^2*x*arctan(a*x)
^2*(a^2*c*x^2+c)^(1/2)/a^2+59/192*c^2*x^3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
+17/48*a^2*c^2*x^5*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)+1/8*a^4*c^2*x^7*arctan
(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 8.35, antiderivative size = 638, normalized size of antiderivative = 1.00, number of steps used = 238, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589, 321}

$$-\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{64a^3\sqrt{a^2cx^2+c}}+\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{64a^3\sqrt{a^2cx^2+c}}+\frac{5c^3\sqrt{a^2x}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] (43*c^2*x*Sqrt[c + a^2*c*x^2])/(4032*a^2) + (29*c^2*x^3*Sqrt[c + a^2*c*x^2]
)/1680 + (a^2*c^2*x^5*Sqrt[c + a^2*c*x^2])/168 + (1373*c^2*Sqrt[c + a^2*c*x
^2]*ArcTan[a*x])/(20160*a^3) - (737*c^2*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
)/(10080*a) - (83*a*c^2*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/840 - (a^3*c^2
*x^6*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/28 + (5*c^2*x*Sqrt[c + a^2*c*x^2]*Arc
Tan[a*x]^2)/(128*a^2) + (59*c^2*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/192
+ (17*a^2*c^2*x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/48 + (a^4*c^2*x^7*Sqrt
[c + a^2*c*x^2]*ArcTan[a*x]^2)/8 + (((5*I)/64)*c^3*Sqrt[1 + a^2*x^2]*ArcTan
[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^3*Sqrt[c + a^2*c*x^2]) - (397*c^(5/2)
*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(5040*a^3) - (((5*I)/64)*c^3*S
qrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqrt[
c + a^2*c*x^2]) + (((5*I)/64)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2,
I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + (5*c^3*Sqrt[1 + a^2*x^2]*
PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(64*a^3*Sqrt[c + a^2*c*x^2]) - (5*c^3*S
qrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(64*a^3*Sqrt[c + a^2*c*x^
2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2\,dx = c\int x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx+\left(a^2c\right)\int x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2$$

$$= c^2\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx+2\left(\left(a^2c^2\right)\int x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\right.$$

$$= c^3\int\frac{x^2\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx+\left(a^2c^3\right)\int\frac{x^4\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx+\left(a^4c^3\right)\int\frac{x^6\tan^{-1}(}{\sqrt{c+a^2c}}$$

$$= \frac{c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2}+\frac{1}{4}c^2x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2+\frac{1}{6}a^2c^2x^5\sqrt{c+}$$

$$= -\frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3}-\frac{c^2x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{6a}-\frac{1}{15}ac^2x^4\sqrt{c+a^2}$$

$$= \frac{c^2x\sqrt{c+a^2cx^2}}{12a^2}+\frac{1}{60}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}+\frac{c^2\sqrt{c+a}}{}$$

$$= -\frac{c^2x\sqrt{c+a^2cx^2}}{18a^2}-\frac{9}{560}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}-\frac{359c^2}{}$$

$$= \frac{491c^2x\sqrt{c+a^2cx^2}}{4032a^2}-\frac{9}{560}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}+\frac{126}{}$$

$$= \frac{491c^2x\sqrt{c+a^2cx^2}}{4032a^2}-\frac{9}{560}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}+\frac{126}{}$$

$$= \frac{491c^2x\sqrt{c+a^2cx^2}}{4032a^2}-\frac{9}{560}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}+\frac{126}{}$$

$$= \frac{491c^2x\sqrt{c+a^2cx^2}}{4032a^2}-\frac{9}{560}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}+\frac{126}{}$$

$$= \frac{491c^2x\sqrt{c+a^2cx^2}}{4032a^2}-\frac{9}{560}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}+\frac{126}{}$$

$$= \frac{491c^2x\sqrt{c+a^2cx^2}}{4032a^2}-\frac{9}{560}c^2x^3\sqrt{c+a^2cx^2}+\frac{1}{168}a^2c^2x^5\sqrt{c+a^2cx^2}+\frac{126}{}$$

Mathematica [A] time = 4.84, size = 759, normalized size = 1.19

$$\frac{c^2\sqrt{a^2cx^2+c}\left(7006ax\left(a^2x^2+1\right)^{7/2}-25088ax\left(a^2x^2+1\right)^{5/2}+53760ax\left(a^2x^2+1\right)^{3/2}+185325ax\left(a^2x^2+1\right)^{7/}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*(53760*a*x*(1 + a^2*x^2)^(3/2) - 25088*a*x*(1 + a^
2*x^2)^(5/2) + 7006*a*x*(1 + a^2*x^2)^(7/2) + 53760*(1 + a^2*x^2)^(3/2)*Arc
```

```
Tan[a*x] + 5376*(1 + a^2*x^2)^(5/2)*ArcTan[a*x] - 38134*(1 + a^2*x^2)^(7/2)
*ArcTan[a*x] + 564480*a*x*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2 + 524160*a*x*(1
 + a^2*x^2)^(5/2)*ArcTan[a*x]^2 + 185325*a*x*(1 + a^2*x^2)^(7/2)*ArcTan[a*x
]^2 + (201600*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 - 203264*ArcTanh[(
a*x)/Sqrt[1 + a^2*x^2]] + 161280*(1 + a^2*x^2)^2*ArcTan[a*x]*Cos[3*ArcTan[a
*x]] + 49280*(1 + a^2*x^2)^3*ArcTan[a*x]*Cos[3*ArcTan[a*x]] - 7658*(1 + a^2
*x^2)^4*ArcTan[a*x]*Cos[3*ArcTan[a*x]] - 40320*(1 + a^2*x^2)^3*ArcTan[a*x]*
Cos[5*ArcTan[a*x]] - 10990*(1 + a^2*x^2)^4*ArcTan[a*x]*Cos[5*ArcTan[a*x]] +
 3150*(1 + a^2*x^2)^4*ArcTan[a*x]*Cos[7*ArcTan[a*x]] - (201600*I)*ArcTan[a*
x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (201600*I)*ArcTan[a*x]*PolyLog[2, I
*E^(I*ArcTan[a*x])] + 201600*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 201600*Po
lyLog[3, I*E^(I*ArcTan[a*x])] + 53760*(1 + a^2*x^2)^2*Sin[3*ArcTan[a*x]] -
48384*(1 + a^2*x^2)^3*Sin[3*ArcTan[a*x]] + 12246*(1 + a^2*x^2)^4*Sin[3*ArcT
an[a*x]] - 80640*(1 + a^2*x^2)^2*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] - 315840*
(1 + a^2*x^2)^3*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] - 93975*(1 + a^2*x^2)^4*Ar
cTan[a*x]^2*Sin[3*ArcTan[a*x]] - 23296*(1 + a^2*x^2)^3*Sin[5*ArcTan[a*x]] +
 7678*(1 + a^2*x^2)^4*Sin[5*ArcTan[a*x]] + 20160*(1 + a^2*x^2)^3*ArcTan[a*x
]^2*Sin[5*ArcTan[a*x]] + 41685*(1 + a^2*x^2)^4*ArcTan[a*x]^2*Sin[5*ArcTan[a
*x]] + 2438*(1 + a^2*x^2)^4*Sin[7*ArcTan[a*x]] - 1575*(1 + a^2*x^2)^4*ArcTa
n[a*x]^2*Sin[7*ArcTan[a*x]]))/(2580480*a^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^6 + 2\,a^2c^2x^4 + c^2x^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*sqrt(a^2*c*x^2 + c)*arctan
(a*x)^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.76, size = 376, normalized size = 0.59

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(5040\arctan\left(ax\right)^2x^7a^7 - 1440\arctan\left(ax\right)x^6a^6 + 14280\arctan\left(ax\right)^2x^5a^5 + 240x^5a^5 - 39\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x)
```

```
[Out] 1/40320*c^2/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(5040*arctan(a*x)^2*x^7*a^7-1440*
arctan(a*x)*x^6*a^6+14280*arctan(a*x)^2*x^5*a^5+240*x^5*a^5-3984*arctan(a*x
)*x^4*a^4+12390*arctan(a*x)^2*x^3*a^3+696*a^3*x^3-2948*arctan(a*x)*a^2*x^2+
1575*arctan(a*x)^2*x*a+430*a*x+2746*arctan(a*x))+1/40320*I*c^2*(c*(a*x-I)*(
I+a*x))^(1/2)*(1575*I*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-157
5*I*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3150*arctan(a*x)*poly
log(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3150*I*polylog(3,I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))-3150*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3150*I
*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6352*arctan((1+I*a*x)/(a^2*x^2+1
)^(1/2)))/a^3/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{5}{2}} x^2 \arctan\left(ax\right)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^2*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2 \operatorname{atan}\left(a\,x\right)^2 \left(c\,a^2\,x^2 + c\right)^{5/2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(5/2),x)
[Out] int(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2 \left(c\left(a^2x^2 + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^2\left(ax\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(5/2)*atan(a*x)**2,x)
[Out] Integral(x**2*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2, x)
```

3.325 $\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2\,dx$

Optimal. Leaf size=387

$$-\frac{5ic^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{56a^2\sqrt{a^2cx^2+c}}+\frac{5ic^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{56a^2\sqrt{a^2cx^2+c}}+\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{28a^2\sqrt{a^2cx^2+c}}+\frac{5c^2\sqrt{a^2\cdots}}{56\cdots}$$

```
[Out] 5/252*c*(a^2*c*x^2+c)^(3/2)/a^2+1/105*(a^2*c*x^2+c)^(5/2)/a^2-5/84*c*x*(a^2
*c*x^2+c)^(3/2)*arctan(a*x)/a-1/21*x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)/a+1/7*
(a^2*c*x^2+c)^(7/2)*arctan(a*x)^2/a^2/c+5/28*I*c^3*arctan(a*x)*arctan((1+I*
a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-5/56*
I*c^3*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(
a^2*c*x^2+c)^(1/2)+5/56*I*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*
(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+5/56*c^2*(a^2*c*x^2+c)^(1/2)/a^2-
5/56*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.28, antiderivative size = 387, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4930, 4878, 4890, 4886}

$$-\frac{5ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{56a^2\sqrt{a^2cx^2+c}}+\frac{5ic^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{56a^2\sqrt{a^2cx^2+c}}+\frac{5c^2\sqrt{a^2cx^2+c}}{56a^2}-\frac{5c^2x\sqrt{a^2cx^2+c}\,\cdots}{56a}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] (5*c^2*Sqrt[c + a^2*c*x^2])/(56*a^2) + (5*c*(c + a^2*c*x^2)^(3/2))/(252*a^2
) + (c + a^2*c*x^2)^(5/2)/(105*a^2) - (5*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x])/(56*a) - (5*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/(84*a) - (x*(c + a^
2*c*x^2)^(5/2)*ArcTan[a*x])/(21*a) + ((c + a^2*c*x^2)^(7/2)*ArcTan[a*x]^2)/
(7*a^2*c) + (((5*I)/28)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I
*a*x]/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c + a^2*c*x^2]) - (((5*I)/56)*c^3*Sqrt[1
+ a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c
+ a^2*c*x^2]) + (((5*I)/56)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*
a*x])/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c + a^2*c*x^2])
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
```

```
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2\,dx=\frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)^2}{7a^2c}-\frac{2\int\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)\,dx}{7a}$$

$$=\frac{\left(c+a^2cx^2\right)^{5/2}}{105a^2}-\frac{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{21a}+\frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)^2}{7a^2c}-$$

$$=\frac{5c\left(c+a^2cx^2\right)^{3/2}}{252a^2}+\frac{\left(c+a^2cx^2\right)^{5/2}}{105a^2}-\frac{5cx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{84a}-$$

$$=\frac{5c^2\sqrt{c+a^2cx^2}}{56a^2}+\frac{5c\left(c+a^2cx^2\right)^{3/2}}{252a^2}+\frac{\left(c+a^2cx^2\right)^{5/2}}{105a^2}-\frac{5c^2x\sqrt{c+a^2cx^2}\tan}{56a}$$

$$=\frac{5c^2\sqrt{c+a^2cx^2}}{56a^2}+\frac{5c\left(c+a^2cx^2\right)^{3/2}}{252a^2}+\frac{\left(c+a^2cx^2\right)^{5/2}}{105a^2}-\frac{5c^2x\sqrt{c+a^2cx^2}\tan}{56a}$$

$$=\frac{5c^2\sqrt{c+a^2cx^2}}{56a^2}+\frac{5c\left(c+a^2cx^2\right)^{3/2}}{252a^2}+\frac{\left(c+a^2cx^2\right)^{5/2}}{105a^2}-\frac{5c^2x\sqrt{c+a^2cx^2}\tan}{56a}$$

Mathematica [B] time = 7.88, size = 1087, normalized size = 2.81

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c^2*(1 + a^2*x^2)*Sqrt[c*(1 + a^2*x^2)]*(2 + 4*ArcTan[a*x]^2 + 2*Cos[2*Arc
Tan[a*x]] - (3*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2]
- ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (3*ArcTan[a
*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ArcTan[a*x]*Cos[3*Arc
Tan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((4*I)*PolyLog[2, (-I)*E^(I*ArcTan
[a*x])])/(1 + a^2*x^2)^(3/2) + ((4*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 +
 a^2*x^2)^(3/2) - 2*ArcTan[a*x]*Sin[2*ArcTan[a*x]]))/(12*a^2) - (c^2*(1 + a
^2*x^2)^2*Sqrt[c*(1 + a^2*x^2)]*(50 - 32*ArcTan[a*x]^2 + 72*Cos[2*ArcTan[a*
x]] + 160*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 22*Cos[4*ArcTan[a*x]] - (110*A
rcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 55*ArcTan[a*x]
*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 11*ArcTan[a*x]*Cos[5*Arc
Tan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (110*ArcTan[a*x]*Log[1 + I*E^(I*Ar
cTan[a*x])])/Sqrt[1 + a^2*x^2] + 55*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 +
I*E^(I*ArcTan[a*x])] + 11*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 + I*E^(I*Arc
Tan[a*x])] - ((176*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(5/
2) + ((176*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(5/2) + 4*ArcT
an[a*x]*Sin[2*ArcTan[a*x]] - 22*ArcTan[a*x]*Sin[4*ArcTan[a*x]]))/(480*a^2)
+ (c^2*(1 + a^2*x^2)^3*Sqrt[c*(1 + a^2*x^2)]*(4116 + 10944*ArcTan[a*x]^2 +
```

```
6262*Cos[2*ArcTan[a*x]] - 5376*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 2764*Cos[
4*ArcTan[a*x]] + 6720*ArcTan[a*x]^2*Cos[4*ArcTan[a*x]] + 618*Cos[6*ArcTan[a
*x]] - (10815*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] -
 6489*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 2163*Ar
cTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] - 309*ArcTan[a*x]
*Cos[7*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (10815*ArcTan[a*x]*Log[1
 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + 6489*ArcTan[a*x]*Cos[3*ArcTan[
a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] + 2163*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Lo
g[1 + I*E^(I*ArcTan[a*x])] + 309*ArcTan[a*x]*Cos[7*ArcTan[a*x]]*Log[1 + I*E
^(I*ArcTan[a*x])] - ((19776*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2
*x^2)^(7/2) + ((19776*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(7/
2) - 1266*ArcTan[a*x]*Sin[2*ArcTan[a*x]] + 360*ArcTan[a*x]*Sin[4*ArcTan[a*x
]] - 618*ArcTan[a*x]*Sin[6*ArcTan[a*x]]))/(161280*a^2)
```

fricas [F] time = 1.32, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*sqrt(a^2*c*x^2 + c)*arctan(a
*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.19, size = 275, normalized size = 0.71

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(360\arctan\left(ax\right)^2x^6a^6-120\arctan\left(ax\right)x^5a^5+1080\arctan\left(ax\right)^2x^4a^4+24a^4x^4-390\,\text{arc}}{2520a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x)
```

```
[Out] 1/2520*c^2/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(360*arctan(a*x)^2*x^6*a^6-120*arc
tan(a*x)*x^5*a^5+1080*arctan(a*x)^2*x^4*a^4+24*a^4*x^4-390*arctan(a*x)*x^3*
a^3+1080*arctan(a*x)^2*x^2*a^2+98*a^2*x^2-495*arctan(a*x)*x*a+360*arctan(a*
x)^2+299)+5/56*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(I*dilog(1-I*(1+I*a*x)/(a^2*x^
2+1)^(1/2))+arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)*ln(
1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/
a^2/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a^2cx^2+c\right)^{\frac{5}{2}}x\arctan\left(ax\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x \operatorname{atan}(a x)^2 \left(c a^2 x^2 + c\right)^{5/2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^2*(c + a^2*c*x^2)^(5/2),x)
[Out] int(x*atan(a*x)^2*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x \left(c \left(a^2 x^2 + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^2(a x)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)*atan(a*x)**2,x)
[Out] Integral(x*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2, x)
```

3.326 $\int \left(c + a^2cx^2\right)^{5/2} \tan^{-1}(ax)^2\, dx$

Optimal. Leaf size=516

$$\frac{259c^{5/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{360a}+\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{8a\sqrt{a^2cx^2+c}}$$

```
[Out] 1/60*c*x*(a^2*c*x^2+c)^(3/2)-5/36*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/a-1/15*
(a^2*c*x^2+c)^(5/2)*arctan(a*x)/a+5/24*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^
2+1/6*x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2+259/360*c^(5/2)*arctanh(a*x*c^(1/
2)/(a^2*c*x^2+c)^(1/2))/a-5/8*I*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arc
tan(a*x)^2*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+5/8*I*c^3*arctan(a*x)*po
lylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(
1/2)-5/8*I*c^3*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^
2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-5/8*c^3*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+5/8*c^3*polylog(3,I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+17/180*c^2*x*
(a^2*c*x^2+c)^(1/2)-5/8*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a+5/16*c^2*x*ar
ctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.39, antiderivative size = 516, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4880, 4890, 4888, 4181, 2531, 2282, 6589, 217, 206, 195}

$$\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{5c^3\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] (17*c^2*x*Sqrt[c + a^2*c*x^2])/180 + (c*x*(c + a^2*c*x^2)^(3/2))/60 - (5*c^
2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(8*a) - (5*c*(c + a^2*c*x^2)^(3/2)*ArcTa
n[a*x])/(36*a) - ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/(15*a) + (5*c^2*x*Sqrt
[c + a^2*c*x^2]*ArcTan[a*x]^2)/16 + (5*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x
]^2)/24 + (x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/6 - (((5*I)/8)*c^3*Sqrt[1
 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a*Sqrt[c + a^2*c*x^2]
) + (259*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(360*a) + (((5
*I)/8)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])]
)/(a*Sqrt[c + a^2*c*x^2]) - (((5*I)/8)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Po
lyLog[2, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - (5*c^3*Sqrt[1 + a^
2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(8*a*Sqrt[c + a^2*c*x^2]) + (5*c
^3*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(8*a*Sqrt[c + a^2*c*x
^2])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2\,dx = -\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{15a}+\frac{1}{6}x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2+\frac{1}{15}c\int\left(c+a^2cx^2\right)^{3}$$

$$=\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{36a}-\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{15a}+$$

$$=\frac{17}{180}c^2x\sqrt{c+a^2cx^2}+\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{8a}-\frac{5c\left(c+\right.}{}$$

$$=\frac{17}{180}c^2x\sqrt{c+a^2cx^2}+\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{8a}-\frac{5c\left(c+\right.}{}$$

$$=\frac{17}{180}c^2x\sqrt{c+a^2cx^2}+\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{8a}-\frac{5c\left(c+\right.}{}$$

$$=\frac{17}{180}c^2x\sqrt{c+a^2cx^2}+\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{8a}-\frac{5c\left(c+\right.}{}$$

$$=\frac{17}{180}c^2x\sqrt{c+a^2cx^2}+\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{8a}-\frac{5c\left(c+\right.}{}$$

$$=\frac{17}{180}c^2x\sqrt{c+a^2cx^2}+\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{8a}-\frac{5c\left(c+\right.}{}$$

$$=\frac{17}{180}c^2x\sqrt{c+a^2cx^2}+\frac{1}{60}cx\left(c+a^2cx^2\right)^{3/2}-\frac{5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{8a}-\frac{5c\left(c+\right.}{}$$

Mathematica [A] time = 1.66, size = 771, normalized size = 1.49

$$\frac{c^2\sqrt{a^2cx^2+c}\left(-108a^6x^6\sin\left(3\tan^{-1}(ax)\right)-705a^6x^6\tan^{-1}(ax)^2\sin\left(3\tan^{-1}(ax)\right)-52a^6x^6\sin\left(5\tan^{-1}(ax)\right)+4\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2,x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*(424*a*x*Sqrt[1 + a^2*x^2] + 368*a^3*x^3*Sqrt[1 +
a^2*x^2] - 56*a^5*x^5*Sqrt[1 + a^2*x^2] - 11028*Sqrt[1 + a^2*x^2]*ArcTan[a*
x] + 504*a^2*x^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + 12*a^4*x^4*Sqrt[1 + a^2*x^
2]*ArcTan[a*x] + 11970*a*x*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + 7380*a^3*x^3*S
qrt[1 + a^2*x^2]*ArcTan[a*x]^2 + 1170*a^5*x^5*Sqrt[1 + a^2*x^2]*ArcTan[a*x]
^2 - (7200*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 8288*ArcTanh[(a*x)/
Sqrt[1 + a^2*x^2]] + 1550*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 3210*a^2*x^2*Arc
Tan[a*x]*Cos[3*ArcTan[a*x]] + 1770*a^4*x^4*ArcTan[a*x]*Cos[3*ArcTan[a*x]] +
 110*a^6*x^6*ArcTan[a*x]*Cos[3*ArcTan[a*x]] - 90*ArcTan[a*x]*Cos[5*ArcTan[a
*x]] - 270*a^2*x^2*ArcTan[a*x]*Cos[5*ArcTan[a*x]] - 270*a^4*x^4*ArcTan[a*x]
*Cos[5*ArcTan[a*x]] - 90*a^6*x^6*ArcTan[a*x]*Cos[5*ArcTan[a*x]] + (7200*I)*
ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (7200*I)*ArcTan[a*x]*PolyL
og[2, I*E^(I*ArcTan[a*x])] - 7200*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 7200
*PolyLog[3, I*E^(I*ArcTan[a*x])] + 372*Sin[3*ArcTan[a*x]] + 636*a^2*x^2*Sin
[3*ArcTan[a*x]] + 156*a^4*x^4*Sin[3*ArcTan[a*x]] - 108*a^6*x^6*Sin[3*ArcTan
```

```
[a*x]] - 1425*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] - 3555*a^2*x^2*ArcTan[a*x]^2
*Sin[3*ArcTan[a*x]] - 2835*a^4*x^4*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] - 705*a
^6*x^6*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] - 52*Sin[5*ArcTan[a*x]] - 156*a^2*x
^2*Sin[5*ArcTan[a*x]] - 156*a^4*x^4*Sin[5*ArcTan[a*x]] - 52*a^6*x^6*Sin[5*A
rcTan[a*x]] + 45*ArcTan[a*x]^2*Sin[5*ArcTan[a*x]] + 135*a^2*x^2*ArcTan[a*x]
^2*Sin[5*ArcTan[a*x]] + 135*a^4*x^4*ArcTan[a*x]^2*Sin[5*ArcTan[a*x]] + 45*a
^6*x^6*ArcTan[a*x]^2*Sin[5*ArcTan[a*x]]))/(11520*a*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.96, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.82, size = 342, normalized size = 0.66

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(120\arctan\left(ax\right)^2x^5a^5 - 48\arctan\left(ax\right)x^4a^4 + 390\arctan\left(ax\right)^2x^3a^3 + 12a^3x^3 - 196\,\text{arc}}{720a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x)
```

```
[Out] 1/720*c^2/a*(c*(a*x-I)*(I+a*x))^(1/2)*(120*arctan(a*x)^2*x^5*a^5-48*arctan(
a*x)*x^4*a^4+390*arctan(a*x)^2*x^3*a^3+12*a^3*x^3-196*arctan(a*x)*a^2*x^2+4
95*arctan(a*x)^2*x*a+80*a*x-598*arctan(a*x))-1/720*I*c^2*(c*(a*x-I)*(I+a*x)
)^(1/2)*(225*I*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-225*I*arct
an(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+450*I*polylog(3,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))-450*I*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+450*arcta
n(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-450*arctan(a*x)*polylog(2,-
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+1036*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)))/a/
(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \operatorname{atan}(a\,x)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2*(c + a^2*c*x^2)^(5/2),x)
[Out] int(atan(a*x)^2*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^{2}{\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2, x)
```

3.327 $\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{x}\,dx$

Optimal. Leaf size=605

$$-\frac{149ic^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{60\sqrt{a^2cx^2+c}}+\frac{149ic^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{60\sqrt{a^2cx^2+c}}+\frac{2ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-$$

```
[Out] 1/30*c*(a^2*c*x^2+c)^(3/2)-1/10*a*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)+1/3*c
*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2+1/5*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2+14
9/30*I*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^
(1/2)/(a^2*c*x^2+c)^(1/2)-2*c^3*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)
^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*I*c^3*arctan(a*x)*polylog(2
,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*c^
3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)-149/60*I*c^3*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*
(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+149/60*I*c^3*polylog(2,I*(1+I*a*x)^(1
/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*c^3*polylog(3,
-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*c^3*p
olylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
+29/60*c^2*(a^2*c*x^2+c)^(1/2)-29/60*a*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2
)+c^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.26, antiderivative size = 605, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4950, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4890, 4886, 4878}

$$-\frac{149ic^3\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{60\sqrt{a^2cx^2+c}}+\frac{149ic^3\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{60\sqrt{a^2cx^2+c}}+\frac{2ic^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{P}}{\sqrt{a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x,x]
```

```
[Out] (29*c^2*Sqrt[c + a^2*c*x^2])/60 + (c*(c + a^2*c*x^2)^(3/2))/30 - (29*a*c^2*
x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/60 - (a*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan
[a*x])/10 + c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2 + (c*(c + a^2*c*x^2)^(3/2
)*ArcTan[a*x]^2)/3 + ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/5 + (((149*I)/30
)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]]
)/Sqrt[c + a^2*c*x^2] - (2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I
*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((2*I)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a
*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((2*I)*c^3*Sqrt[1
 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
- (((149*I)/60)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqr
t[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] + (((149*I)/60)*c^3*Sqrt[1 + a^2*x^2]*Po
lyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (2*c^3
*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (2
*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{x}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x}\,dx + \left(a^2c\right)\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx$$

$$= \frac{1}{5}\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2 - \frac{1}{5}(2ac)\int \left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)\,dx + c^2\int$$

$$= \frac{1}{30}c\left(c+a^2cx^2\right)^{3/2} - \frac{1}{10}acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax) + \frac{1}{3}c\left(c+a^2cx^2\right)^{3/2}\tan$$

$$= \frac{29}{60}c^2\sqrt{c+a^2cx^2} + \frac{1}{30}c\left(c+a^2cx^2\right)^{3/2} - \frac{29}{60}ac^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{10}a$$

$$= \frac{29}{60}c^2\sqrt{c+a^2cx^2} + \frac{1}{30}c\left(c+a^2cx^2\right)^{3/2} - \frac{29}{60}ac^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{10}a$$

$$= \frac{29}{60}c^2\sqrt{c+a^2cx^2} + \frac{1}{30}c\left(c+a^2cx^2\right)^{3/2} - \frac{29}{60}ac^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{10}a$$

$$= \frac{29}{60}c^2\sqrt{c+a^2cx^2} + \frac{1}{30}c\left(c+a^2cx^2\right)^{3/2} - \frac{29}{60}ac^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{10}a$$

$$= \frac{29}{60}c^2\sqrt{c+a^2cx^2} + \frac{1}{30}c\left(c+a^2cx^2\right)^{3/2} - \frac{29}{60}ac^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{10}a$$

$$= \frac{29}{60}c^2\sqrt{c+a^2cx^2} + \frac{1}{30}c\left(c+a^2cx^2\right)^{3/2} - \frac{29}{60}ac^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{10}a$$

Mathematica [A] time = 7.14, size = 889, normalized size = 1.47

$$\sqrt{c\left(a^2x^2+1\right)}\left(\frac{\left(\log\left(1-e^{i\tan^{-1}(ax)}\right)-\log\left(1+e^{i\tan^{-1}(ax)}\right)\right)\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}}+\tan^{-1}(ax)^2+\frac{2i\left(\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-\text{L}\right.}{\sqrt{a^2}}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x,x]
```

```
[Out] c^2*Sqrt[c*(1 + a^2*x^2)]*(ArcTan[a*x]^2 + (ArcTan[a*x]^2*(Log[1 - E^(I*Arc
Tan[a*x])] - Log[1 + E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] - (2*(ArcTan[a*
x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + I*(PolyL
og[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2, I*E^(I*ArcTan[a*x])])))/Sqrt[1 +
 a^2*x^2] + ((2*I)*ArcTan[a*x]*(PolyLog[2, -E^(I*ArcTan[a*x])] - PolyLog[2,
 E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] + (2*(-PolyLog[3, -E^(I*ArcTan[a*x]
)] + PolyLog[3, E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2]) + (c^2*(1 + a^2*x^2
)*Sqrt[c*(1 + a^2*x^2)]*(2 + 4*ArcTan[a*x]^2 + 2*Cos[2*ArcTan[a*x]] - (3*Ar
cTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ArcTan[a*x]*Cos
[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (3*ArcTan[a*x]*Log[1 + I*E^(
I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 +
 I*E^(I*ArcTan[a*x])] - ((4*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2
*x^2)^(3/2) + ((4*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3/2) -
 2*ArcTan[a*x]*Sin[2*ArcTan[a*x]]))/6 - (c^2*(1 + a^2*x^2)^2*Sqrt[c*(1 + a^
2*x^2)]*(50 - 32*ArcTan[a*x]^2 + 72*Cos[2*ArcTan[a*x]] + 160*ArcTan[a*x]^2*
Cos[2*ArcTan[a*x]] + 22*Cos[4*ArcTan[a*x]] - (110*ArcTan[a*x]*Log[1 - I*E^(
I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 55*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[
1 - I*E^(I*ArcTan[a*x])] - 11*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 - I*E^(I
*ArcTan[a*x])] + (110*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^
2*x^2] + 55*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] + 1
1*ArcTan[a*x]*Cos[5*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((176*I)*Po
lyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(5/2) + ((176*I)*PolyLog[2,
 I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(5/2) + 4*ArcTan[a*x]*Sin[2*ArcTan[a*x
]] - 22*ArcTan[a*x]*Sin[4*ArcTan[a*x]]))/960
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^2/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.06, size = 404, normalized size = 0.67

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(12\arctan\left(ax\right)^2x^4a^4-6\arctan\left(ax\right)x^3a^3+44\arctan\left(ax\right)^2x^2a^2+2a^2x^2-35\arctan\left(ax\right)\right.}{60}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x,x)
```

```
[Out] 1/60*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(12*arctan(a*x)^2*x^4*a^4-6*arctan(a*x)*
x^3*a^3+44*arctan(a*x)^2*x^2*a^2+2*a^2*x^2-35*arctan(a*x)*x*a+92*arctan(a*x
```

```
)^2+31)-1/60*I*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(60*I*arctan(a*x)^2*ln(1-(1+I*
a*x)/(a^2*x^2+1)^(1/2))-60*I*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2)
)+149*I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-149*I*arctan(a*x)*l
n(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+120*I*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1
/2))-120*I*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+120*arctan(a*x)*polylog(
2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-120*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^
2+1)^(1/2))+149*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-149*dilog(1-I*(1+I*a
*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x,x)
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^2\left(ax\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**2/x,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2/x, x)
```

3.328 $\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{x^2}\,dx$

Optimal. Leaf size=655

$$\frac{11}{6}ac^{5/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)+\frac{2iac^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac^3\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{15iac^3\sqrt{a^2x^2+1}\,\text{ta}}{4\sqrt{}}$$

```
[Out] -1/6*a*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)+1/4*a^2*c*x*(a^2*c*x^2+c)^(3/2)*ar
ctan(a*x)^2+11/6*a*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))-15/4*I*
a*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)-4*a*c^3*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1
/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+15/4*I*a*c^3*arctan(a*x)*polylog
(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-15
/4*I*a*c^3*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)
^(1/2)/(a^2*c*x^2+c)^(1/2)+2*I*a*c^3*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(
1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*a*c^3*polylog(2,(1+I*a*x)^(
1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-15/4*a*c^3*poly
log(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
+15/4*a*c^3*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)+1/12*a^2*c^2*x*(a^2*c*x^2+c)^(1/2)-7/4*a*c^2*arctan(a*x)*(a
^2*c*x^2+c)^(1/2)-c^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x+7/8*a^2*c^2*x*arc
tan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.41, antiderivative size = 655, normalized size of antiderivative = 1.00, number of steps used = 43, number of rules used = 14, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4950, 4944, 4958, 4954, 4890, 4888, 4181, 2531, 2282, 6589, 4880, 217, 206, 195}

$$\frac{2iac^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2iac^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{15iac^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLo}}{4\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] (a^2*c^2*x*Sqrt[c + a^2*c*x^2])/12 - (7*a*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*
x])/4 - (a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/6 - (c^2*Sqrt[c + a^2*c*x^2
]*ArcTan[a*x]^2)/x + (7*a^2*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/8 + (a
^2*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/4 - (((15*I)/4)*a*c^3*Sqrt[1 +
a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2] - (4*
a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]
])/Sqrt[c + a^2*c*x^2] + (11*a*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c
*x^2]])/6 + (((15*I)/4)*a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)
*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (((15*I)/4)*a*c^3*Sqrt[1 + a^2*x
^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((2*
I)*a*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/
Sqrt[c + a^2*c*x^2] - ((2*I)*a*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*
a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (15*a*c^3*Sqrt[1 + a^2*x^2]*Po
lyLog[3, (-I)*E^(I*ArcTan[a*x])])/(4*Sqrt[c + a^2*c*x^2]) + (15*a*c^3*Sqrt[
1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(4*Sqrt[c + a^2*c*x^2])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
```

```
Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
```

```
IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{x^2}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^2}\,dx + \left(a^2c\right)\int \left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx$$

$$= -\frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax) + \frac{1}{4}a^2cx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2 + c^2\int \frac{\sqrt{c}}{}$$

$$= \frac{1}{12}a^2c^2x\sqrt{c+a^2cx^2} - \frac{7}{4}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}$$

$$= \frac{1}{12}a^2c^2x\sqrt{c+a^2cx^2} - \frac{7}{4}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}$$

$$= \frac{1}{12}a^2c^2x\sqrt{c+a^2cx^2} - \frac{7}{4}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}$$

$$= \frac{1}{12}a^2c^2x\sqrt{c+a^2cx^2} - \frac{7}{4}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}$$

$$= \frac{1}{12}a^2c^2x\sqrt{c+a^2cx^2} - \frac{7}{4}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}$$

$$= \frac{1}{12}a^2c^2x\sqrt{c+a^2cx^2} - \frac{7}{4}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}$$

$$= \frac{1}{12}a^2c^2x\sqrt{c+a^2cx^2} - \frac{7}{4}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{1}{6}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}$$

Mathematica [A] time = 1.79, size = 626, normalized size = 0.96

$$\frac{c^2\sqrt{a^2cx^2+c}\left(2a^5x^5\sin\left(3\tan^{-1}(ax)\right) - 3a^5x^5\tan^{-1}(ax)^2\sin\left(3\tan^{-1}(ax)\right) + 6a^5x^5\tan^{-1}(ax)\cos\left(3\tan^{-1}(ax\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x^2,x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*(2*a^2*x^2*Sqrt[1 + a^2*x^2] + 2*a^4*x^4*Sqrt[1 +
a^2*x^2] - 190*a*x*Sqrt[1 + a^2*x^2]*ArcTan[a*x] + 2*a^3*x^3*Sqrt[1 + a^2*x
^2]*ArcTan[a*x] - 96*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + 117*a^2*x^2*Sqrt[1 +
 a^2*x^2]*ArcTan[a*x]^2 + 21*a^4*x^4*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 - (168
*I)*a*x*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 176*a*x*ArcTanh[(a*x)/Sqr
t[1 + a^2*x^2]] + 6*a*x*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 12*a^3*x^3*ArcTan[
a*x]*Cos[3*ArcTan[a*x]] + 6*a^5*x^5*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 192*a*
x*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] + 96*a*x*ArcTan[a*x]^2*Log[1 - I*E
^(I*ArcTan[a*x])] - 96*a*x*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] - 192
*a*x*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] + (192*I)*a*x*PolyLog[2, -E^(I*
ArcTan[a*x])] + (360*I)*a*x*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])]
- (360*I)*a*x*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - (192*I)*a*x*Pol
yLog[2, E^(I*ArcTan[a*x])] - 360*a*x*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 3
60*a*x*PolyLog[3, I*E^(I*ArcTan[a*x])] + 2*a*x*Sin[3*ArcTan[a*x]] + 4*a^3*x
^3*Sin[3*ArcTan[a*x]] + 2*a^5*x^5*Sin[3*ArcTan[a*x]] - 3*a*x*ArcTan[a*x]^2*
Sin[3*ArcTan[a*x]] - 6*a^3*x^3*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] - 3*a^5*x^5
*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]]))/(96*x*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^2/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.09, size = 399, normalized size = 0.61

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(6\arctan\left(ax\right)^2x^4a^4-4\arctan\left(ax\right)x^3a^3+27\arctan\left(ax\right)^2x^2a^2+2a^2x^2-46\arctan\left(ax\right)x}{24x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^2,x)
```

```
[Out] 1/24*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(6*arctan(a*x)^2*x^4*a^4-4*arctan(a*x)*x
^3*a^3+27*arctan(a*x)^2*x^2*a^2+2*a^2*x^2-46*arctan(a*x)*x*a-24*arctan(a*x)
^2)/x-1/24*I*a*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(45*I*arctan(a*x)^2*ln(1-I*(1+
I*a*x)/(a^2*x^2+1)^(1/2))-45*I*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))-48*I*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+90*I*polylog(3,I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))-90*I*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+
90*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-90*arctan(a*x)*poly
log(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+88*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)
)-48*dilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-48*dilog((1+I*a*x)/(a^2*x^2+1)^(1
/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x^2,x)
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^2\left(ax\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**2/x**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2/x**2, x)
```

3.329 $\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^2}{x^3}\,dx$

Optimal. Leaf size=661

$$-a^2c^{5/2}\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)-\frac{13ia^2c^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{13ia^2c^3\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{5ia^2c^3\sqrt{a^2x^2+}}{}$$

```
[Out] 1/3*a^2*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2-a^2*c^(5/2)*arctanh((a^2*c*x^2+
c)^(1/2)/c^(1/2))+26/3*I*a^2*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*
x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5*a^2*c^3*arctan(a*x)^2*arc
tanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+5*I
*a^2*c^3*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1
/2)/(a^2*c*x^2+c)^(1/2)-5*I*a^2*c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^
2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-13/3*I*a^2*c^3*polylog(2,
-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+1
3/3*I*a^2*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2
)/(a^2*c*x^2+c)^(1/2)-5*a^2*c^3*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^
2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+5*a^2*c^3*polylog(3,(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+1/3*a^2*c^2*(a^2*c*x^2+c)^(1
/2)-a*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x-1/3*a^3*c^2*x*arctan(a*x)*(a^2*
c*x^2+c)^(1/2)+2*a^2*c^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)-1/2*c^2*arctan(a
*x)^2*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 2.62, antiderivative size = 661, normalized size of antiderivative = 1.00, number of steps used = 57, number of rules used = 16, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4950, 4962, 4944, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4890, 4886, 4878}

$$-\frac{13ia^2c^3\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{13ia^2c^3\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{5ia^2c^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)}{\sqrt{a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] (a^2*c^2*Sqrt[c + a^2*c*x^2])/3 - (a*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x
 - (a^3*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/3 + 2*a^2*c^2*Sqrt[c + a^2*c
*x^2]*ArcTan[a*x]^2 - (c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*x^2) + (a^
2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/3 + (((26*I)/3)*a^2*c^3*Sqrt[1 + a
^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c
*x^2] - (5*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x]
)])/Sqrt[c + a^2*c*x^2] - a^2*c^(5/2)*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]]
+ ((5*I)*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x]
)])/Sqrt[c + a^2*c*x^2] - ((5*I)*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Poly
Log[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (((13*I)/3)*a^2*c^3*Sqrt[1
 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^
2*c*x^2] + (((13*I)/3)*a^2*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a
*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (5*a^2*c^3*Sqrt[1 + a^2*x^2]*P
olyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (5*a^2*c^3*Sqrt[1 + a^
2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
```

```
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
```

```
IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{x^3}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^3}\,dx + \left(a^2c\right)\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x}\,dx$$

$$= c^2\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^3}\,dx + 2\left(\left(a^2c^2\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x}\,dx\right) +$$

$$= \frac{1}{3}a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2 - \frac{1}{3}\left(2a^3c^2\right)\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)\,dx + c^3$$

$$= \frac{1}{3}a^2c^2\sqrt{c+a^2cx^2} - \frac{1}{3}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{2x^2}$$

$$= \frac{1}{3}a^2c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{1}{3}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(a$$

$$= \frac{1}{3}a^2c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{1}{3}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(a$$

$$= \frac{1}{3}a^2c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{1}{3}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(a$$

$$= \frac{1}{3}a^2c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{1}{3}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(a$$

$$= \frac{1}{3}a^2c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{1}{3}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(a$$

$$= \frac{1}{3}a^2c^2\sqrt{c+a^2cx^2} - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{1}{3}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(a$$

Mathematica [A] time = 7.59, size = 761, normalized size = 1.15

$$2a^2c^2\sqrt{c\left(a^2x^2+1\right)}\left(\frac{2i\tan^{-1}(ax)\left(\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)\right)}{\sqrt{a^2x^2+1}} + \frac{2\left(\text{Li}_3\left(e^{i\tan^{-1}(ax)}\right)-\text{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)\right)}{\sqrt{a^2x^2+1}}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x^3,x]
```

```
[Out] 2*a^2*c^2*Sqrt[c*(1 + a^2*x^2)]*(ArcTan[a*x]^2 + (ArcTan[a*x]^2*(Log[1 - E^
(I*ArcTan[a*x])] - Log[1 + E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] - (2*(Arc
Tan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + I*
(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2, I*E^(I*ArcTan[a*x])])))/Sq
rt[1 + a^2*x^2] + ((2*I)*ArcTan[a*x]*(PolyLog[2, -E^(I*ArcTan[a*x])] - Poly
Log[2, E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] + (2*(-PolyLog[3, -E^(I*ArcTa
n[a*x])] + PolyLog[3, E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2]) + (a^2*c^2*(1
 + a^2*x^2)*Sqrt[c*(1 + a^2*x^2)]*(2 + 4*ArcTan[a*x]^2 + 2*Cos[2*ArcTan[a*x
]] - (3*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ArcTa
n[a*x]*Cos[3*ArcTan[a*x]]*Log[1 - I*E^(I*ArcTan[a*x])] + (3*ArcTan[a*x]*Log
[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ArcTan[a*x]*Cos[3*ArcTan[a*x
```

```
]]*Log[1 + I*E^(I*ArcTan[a*x])] - ((4*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])]
)/(1 + a^2*x^2)^(3/2) + ((4*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^
2)^(3/2) - 2*ArcTan[a*x]*Sin[2*ArcTan[a*x]]))/12 + (a^2*c^2*Sqrt[c*(1 + a^2
*x^2)]*(-4*ArcTan[a*x]*Cot[ArcTan[a*x]/2] - ArcTan[a*x]^2*Csc[ArcTan[a*x]/2
]^2 + 4*ArcTan[a*x]^2*(Log[1 - E^(I*ArcTan[a*x])] - Log[1 + E^(I*ArcTan[a*x
])]) + 8*Log[Tan[ArcTan[a*x]/2]] + (8*I)*ArcTan[a*x]*(PolyLog[2, -E^(I*ArcT
an[a*x])] - PolyLog[2, E^(I*ArcTan[a*x])]) + 8*(-PolyLog[3, -E^(I*ArcTan[a*
x])] + PolyLog[3, E^(I*ArcTan[a*x])]) + ArcTan[a*x]^2*Sec[ArcTan[a*x]/2]^2
- 4*ArcTan[a*x]*Tan[ArcTan[a*x]/2]))/(8*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^2/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.51, size = 454, normalized size = 0.69

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(2\arctan\left(ax\right)^2x^4a^4-2\arctan\left(ax\right)x^3a^3+14\arctan\left(ax\right)^2x^2a^2+2a^2x^2-6\arctan\left(ax\right)xa\right.}{6x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^3,x)
```

```
[Out] 1/6*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)^2*x^4*a^4-2*arctan(a*x)*x^
3*a^3+14*arctan(a*x)^2*x^2*a^2+2*a^2*x^2-6*arctan(a*x)*x*a-3*arctan(a*x)^2)
/x^2+1/6*a^2*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(-15*arctan(a*x)^2*ln(1+(1+I*a*x
)/(a^2*x^2+1)^(1/2))+30*I*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2
))+15*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-30*I*arctan(a*x)*poly
log(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-26*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/
2))+26*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+26*arctan(a*x)*ln(1+I*(1+I*
a*x)/(a^2*x^2+1)^(1/2))-26*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+
6*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)-30*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/
2))+30*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*ln(1+(1+I*a*x)/(a^2*x^2+1)^
(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x^3,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^{2}{\left(a x \right)}}{x^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**2/x**3,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2/x**3, x)
```

3.330 $\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{x^4}\,dx$

Optimal. Leaf size=675

$$-\frac{a^2c^2\sqrt{a^2cx^2+c}}{3x}-\frac{2a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{x}-\frac{ac^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3x^2}-\frac{c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^2}{3x^3}+\frac{1}{2}a^4c^2x$$

```
[Out] -1/3*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/x^3+a^3*c^(5/2)*arctanh(a*x*c^(1/2
)/(a^2*c*x^2+c)^(1/2))-5*I*a^3*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arct
an(a*x)^2*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-26/3*a^3*c^3*arctan(a*x)*ar
ctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2
)+5*I*a^3*c^3*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^
2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5*I*a^3*c^3*arctan(a*x)*polylog(2,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+13/3*I*a^3*c^3*p
olylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^
(1/2)-13/3*I*a^3*c^3*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)
^(1/2)/(a^2*c*x^2+c)^(1/2)-5*a^3*c^3*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+5*a^3*c^3*polylog(3,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/3*a^2*c^2*(a^2*c*
x^2+c)^(1/2)/x-a^3*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-1/3*a*c^2*arctan(a*x
)*(a^2*c*x^2+c)^(1/2)/x^2-2*a^2*c^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x+1/2
*a^4*c^2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 2.31, antiderivative size = 675, normalized size of antiderivative = 1.00, number of steps used = 48, number of rules used = 16, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4950, 4944, 4946, 4962, 264, 4958, 4954, 4890, 4888, 4181, 2531, 2282, 6589, 4880, 217, 206}

$$\frac{13ia^3c^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}-\frac{13ia^3c^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{5ia^3c^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Po}}{\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -(a^2*c^2*Sqrt[c + a^2*c*x^2])/(3*x) - a^3*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x] - (a*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*x^2) - (2*a^2*c^2*Sqrt[c +
 a^2*c*x^2]*ArcTan[a*x]^2)/x + (a^4*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2
)/2 - (c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/(3*x^3) - ((5*I)*a^3*c^3*Sqrt
[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2]
- (26*a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1
- I*a*x]])/(3*Sqrt[c + a^2*c*x^2]) + a^3*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt
[c + a^2*c*x^2]] + ((5*I)*a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2,
(-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((5*I)*a^3*c^3*Sqrt[1 + a^2*
x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (((
13*I)/3)*a^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*
a*x])])/Sqrt[c + a^2*c*x^2] - (((13*I)/3)*a^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog
[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (5*a^3*c^3*Sqrt
[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (5*
a^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x
^2]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4946

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*Sqrt[(d_) + (e_.)*
(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x
]))/(f*(m + 2)), x] + (Dist[d/(m + 2), Int[((f*x)^m*(a + b*ArcTan[c*x]))/Sq
rt[d + e*x^2], x], x] - Dist[(b*c*d)/(f*(m + 2)), Int[(f*x)^(m + 1)/Sqrt[d
+ e*x^2], x], x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && Ne
Q[m, -2]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{x^4}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^4}\,dx + \left(a^2c\right)\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{x^2}\,dx$$

$$= c^2\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^4}\,dx + 2\left(\left(a^2c^2\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^2}\,dx\right) +$$

$$= -a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\left(c+a^2cx^2\right)}{3}$$

$$= -a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{2ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2} + \frac{1}{2}a^4c^2x\sqrt{c+a^2c}$$

$$= -\frac{2a^2c^2\sqrt{c+a^2cx^2}}{3x} - a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}}{3x} - a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}}{3x} - a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}}{3x} - a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}}{3x} - a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3x^2}$$

<u>Mathematica</u> [A] time = 4.76, size = 644, normalized size = 0.95

$$-\frac{c^3\sqrt{a^2x^2+1}\left(-52ia^3x^3\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - 60ia^3x^3\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) + 60ia^3x^3\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2)/x^4,x]
```

```
[Out] -1/12*(c^3*Sqrt[1 + a^2*x^2]*(2*(1 + a^2*x^2)^(3/2) + 12*a^3*x^3*Sqrt[1 + a
^2*x^2]*ArcTan[a*x] + 24*a^2*x^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 - 6*a^4*x^
4*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + 4*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2 + (
12*I)*a^3*x^3*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 - 12*a^3*x^3*ArcTanh[
(a*x)/Sqrt[1 + a^2*x^2]] - 2*(1 + a^2*x^2)^(3/2)*Cos[2*ArcTan[a*x]] - 3*a*x
*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] - 51*a^3*x^3*ArcTan[a*x]*Log[1 - E^
(I*ArcTan[a*x])] - 24*a^3*x^3*ArcTan[a*x]^2*Log[1 - I*E^(I*ArcTan[a*x])] +
24*a^3*x^3*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] + 3*a*x*ArcTan[a*x]*L
og[1 + E^(I*ArcTan[a*x])] + 51*a^3*x^3*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x]
)] - (52*I)*a^3*x^3*PolyLog[2, -E^(I*ArcTan[a*x])] - (60*I)*a^3*x^3*ArcTan[
a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (60*I)*a^3*x^3*ArcTan[a*x]*PolyLo
g[2, I*E^(I*ArcTan[a*x])] + (52*I)*a^3*x^3*PolyLog[2, E^(I*ArcTan[a*x])] +
60*a^3*x^3*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 60*a^3*x^3*PolyLog[3, I*E^(
I*ArcTan[a*x])] + 2*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]*Sin[2*ArcTan[a*x]] + (1
 + a^2*x^2)^(3/2)*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])]*Sin[3*ArcTan[a*x]]
```

```
- (1 + a^2*x^2)^(3/2)*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])]*Sin[3*ArcTan[
a*x]]))/(x^3*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^2}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^2/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.81, size = 401, normalized size = 0.59

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(3\arctan\left(ax\right)^2 x^4a^4 - 6\arctan\left(ax\right)x^3a^3 - 14\arctan\left(ax\right)^2 x^2a^2 - 2a^2x^2 - 2\arctan\left(ax\right)xa\right.}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^4,x)
```

```
[Out] 1/6*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(3*arctan(a*x)^2*x^4*a^4-6*arctan(a*x)*x^
3*a^3-14*arctan(a*x)^2*x^2*a^2-2*a^2*x^2-2*arctan(a*x)*x*a-2*arctan(a*x)^2)
/x^3-1/6*I*a^3*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(15*I*arctan(a*x)^2*ln(1-I*(1+
I*a*x)/(a^2*x^2+1)^(1/2))-15*I*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))-26*I*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+30*I*polylog(3,I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))-30*I*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+
30*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-30*arctan(a*x)*poly
log(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+12*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)
)-26*dilog(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-26*dilog((1+I*a*x)/(a^2*x^2+1)^(1
/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2 + c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/x^4,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2/x^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x^4,x)
```

```
[Out] int((atan(a*x)^2*(c + a^2*c*x^2)^(5/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^{2}\left(ax\right)}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**2/x**4,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2/x**4, x)
```

3.331 $\int \frac{x^3 \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=315

$$\frac{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}{3a^2c}+\frac{5i\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3a^4\sqrt{a^2cx^2+c}}-\frac{5i\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{3a^4\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}}{3a^4c}-\frac{2\sqrt{a^2cx^2+c}\,\text{ta}}{3a^4c}$$

```
[Out] -10/3*I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/
2)/a^4/(a^2*c*x^2+c)^(1/2)+5/3*I*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/
2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-5/3*I*polylog(2,I*(1+I*a*x)^(
1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+1/3*(a^2*c*
x^2+c)^(1/2)/a^4/c-1/3*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^3/c-2/3*arctan(a
*x)^2*(a^2*c*x^2+c)^(1/2)/a^4/c+1/3*x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a
^2/c
```

Rubi [A] time = 0.43, antiderivative size = 315, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4952, 261, 4890, 4886, 4930}

$$\frac{5i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3a^4\sqrt{a^2cx^2+c}}-\frac{5i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3a^4\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}}{3a^4c}+\frac{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}{3a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Sqrt[c + a^2*c*x^2]/(3*a^4*c) - (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3*a^3*
c) - (2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(3*a^4*c) + (x^2*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x]^2)/(3*a^2*c) - (((10*I)/3)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*A
rcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^2*c*x^2]) + (((5*I)
/3)*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(
a^4*Sqrt[c + a^2*c*x^2]) - (((5*I)/3)*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[
1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^4*Sqrt[c + a^2*c*x^2])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx = \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3a^2c} - \frac{2\int \frac{x\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{3a^2} - \frac{2\int \frac{x^2\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{3a}$$

$$= -\frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^3c} - \frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3a^4c} + \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3a^2c} + \frac{\int \frac{\mathrm{t}}{\sqrt{}}}{}$$

$$= \frac{\sqrt{c+a^2cx^2}}{3a^4c} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^3c} - \frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3a^4c} + \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-}}{3a^2c}$$

$$= \frac{\sqrt{c+a^2cx^2}}{3a^4c} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3a^3c} - \frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3a^4c} + \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-}}{3a^2c}$$

Mathematica [A] time = 0.70, size = 279, normalized size = 0.89

$$\frac{(a^2x^2+1)\sqrt{c(a^2x^2+1)}\left(\frac{20i\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{(a^2x^2+1)^{3/2}} - \frac{20i\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{(a^2x^2+1)^{3/2}} + \frac{15\tan^{-1}(ax)\log\left(1-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} - \frac{15\tan^{-1}(ax)\log\left(1+ie^{i\tan}\right.}{\sqrt{a^2x^2+1}}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] ((1 + a^2*x^2)*Sqrt[c*(1 + a^2*x^2)]*(2 - 2*ArcTan[a*x]^2 + 2*Cos[2*ArcTan[
a*x]] - 6*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + (15*ArcTan[a*x]*Log[1 - I*E^(I
*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + 5*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1
- I*E^(I*ArcTan[a*x])] - (15*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt
[1 + a^2*x^2] - 5*ArcTan[a*x]*Cos[3*ArcTan[a*x]]*Log[1 + I*E^(I*ArcTan[a*x]
)] + ((20*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3/2) - ((20
*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3/2) - 2*ArcTan[a*x]*Si
n[2*ArcTan[a*x]]))/(12*a^4*c)
```

fricas [F] time = 0.71, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^3\arctan(ax)^2}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

[Out] integral(x^3*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 3.08, size = 206, normalized size = 0.65

$$\frac{\left(\arctan(ax)^2 x^2 a^2 - \arctan(ax) x a - 2\arctan(ax)^2 + 1\right)\sqrt{c(ax-i)(ax+i)}}{3c\,a^4} + \frac{5i\left(i\arctan(ax)\ln\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right) -\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)

[Out] 1/3*(arctan(a*x)^2*x^2*a^2-arctan(a*x)*x*a-2*arctan(a*x)^2+1)*(c*(a*x-I)*(I+a*x))^(1/2)/c/a^4+5/3*I*(I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^4/c

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan(ax)^2}{\sqrt{a^2cx^2 + c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")

[Out] integrate(x^3*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3 \operatorname{atan}(a\,x)^2}{\sqrt{c\,a^2\,x^2 + c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2),x)

[Out] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \operatorname{atan}^2(ax)}{\sqrt{c\left(a^2x^2 + 1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**3*atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)

[Out] Integral(x**3*atan(a*x)**2/sqrt(c*(a**2*x**2 + 1)), x)

3.332 $\int \frac{x^2 \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=344

$$\frac{x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{2a^2c}-\frac{i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^3\sqrt{a^2cx^2+c}}+\frac{i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a^3\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2}}{}$$

```
[Out] arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^3/c^(1/2)+I*arctan((1+I*a*x)/(a^
2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-I*a
rctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/
(a^2*c*x^2+c)^(1/2)+I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*
(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+polylog(3,-I*(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-polylog(3,I*(1+I*a*x)/(a
^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-arctan(a*x)*(a^2
*c*x^2+c)^(1/2)/a^3/c+1/2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^2/c
```

Rubi [A] time = 0.33, antiderivative size = 344, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589}

$$-\frac{i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^3\sqrt{a^2cx^2+c}}+\frac{i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^3\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\,\text{P}}{a}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(a^3*c)) + (x*Sqrt[c + a^2*c*x^2]*ArcTa
n[a*x]^2)/(2*a^2*c) + (I*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan
[a*x]^2)/(a^3*Sqrt[c + a^2*c*x^2]) + ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x
^2]]/(a^3*Sqrt[c]) - (I*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*
ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + (I*Sqrt[1 + a^2*x^2]*ArcTan[a*x]
*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + (Sqrt[1 + a^2
*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) - (Sqrt
[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx = \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2c} - \frac{\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{2a^2} - \frac{\int \frac{x\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{a}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2c} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}}\,dx}{a^2} - \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}}{\sqrt{1}}}{2a^2\sqrt{c+a^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2c} + \frac{\text{Subst}\left(\int \frac{1}{1-a^2cx^2}\,dx, x, \frac{x}{\sqrt{c+a^2cx^2}}\right)}{a^2}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan}{a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan}{a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan}{a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan}{a^3\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.36, size = 175, normalized size = 0.51

$$\frac{\sqrt{a^2cx^2+c}\left(\tan^{-1}(ax)\left(ax\tan^{-1}(ax)-2\right)+\frac{2\left(\tanh^{-1}\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)-i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+i\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+\text{Li}_3\left(-\right.\right.}{\sqrt{a^2x^2+1}}\right.}{2a^3c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(ArcTan[a*x]*(-2 + a*x*ArcTan[a*x]) + (2*(I*ArcTan[E^(
I*ArcTan[a*x])]*ArcTan[a*x]^2 + ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - I*ArcTan
[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + I*ArcTan[a*x]*PolyLog[2, I*E^(I*
ArcTan[a*x])] + PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - PolyLog[3, I*E^(I*ArcT
an[a*x])]))/Sqrt[1 + a^2*x^2]))/(2*a^3*c)
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^2\arctan(ax)^2}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(x^2*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

[Out] Timed out

maple [A] time = 2.91, size = 271, normalized size = 0.79

$$\frac{(\arctan(ax)\,xa-2)\arctan(ax)\sqrt{c(ax-i)(ax+i)}}{2c\,a^3}-\frac{\left(\arctan(ax)^2\ln\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-\arctan(ax)^2\ln\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/2*(arctan(a*x)*x*a-2)*arctan(a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/c/a^3-1/2*(ar
ctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)^2*ln(1+I*(1+I*a
*x)/(a^2*x^2+1)^(1/2))-2*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))+2*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+4*I*arctan((
1+I*a*x)/(a^2*x^2+1)^(1/2))+2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*po
lylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2
+1)^(1/2)/a^3/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\arctan(ax)^2}{\sqrt{a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\mathrm{atan}(a\,x)^2}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\,\mathrm{atan}^2(ax)}{\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**2/sqrt(c*(a**2*x**2 + 1)), x)
```

3.333 $\int \frac{x\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=220

$$-\frac{2i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{2i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{a^2c}+\frac{4i\sqrt{a^2x^2+1}\,\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)\ldots}{a^2\sqrt{a^2cx^2+c}}$$

```
[Out] 4*I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a
^2/(a^2*c*x^2+c)^(1/2)-2*I*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a
^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+2*I*polylog(2,I*(1+I*a*x)^(1/2)/(1-
I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^2*(a^2*
c*x^2+c)^(1/2)/a^2/c
```

Rubi [A] time = 0.14, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4930, 4890, 4886}

$$-\frac{2i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{2i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{a^2c}+\frac{4i\sqrt{a^2x^2+\ldots}}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(a^2*c) + ((4*I)*Sqrt[1 + a^2*x^2]*ArcT
an[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c + a^2*c*x^2])
- ((2*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x
]])/(a^2*Sqrt[c + a^2*c*x^2]) + ((2*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt
[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^2*Sqrt[c + a^2*c*x^2])
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx = \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{a^2c} - \frac{2\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{a}$$
$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{a^2c} - \frac{\left(2\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)}{\sqrt{1+a^2x^2}}\,dx}{a\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{a^2c} + \frac{4i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^2\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\,\mathrm{Li}_2\left(-\frac{i\sqrt{1+i}}{\sqrt{1-i}}\right.}{a^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.25, size = 126, normalized size = 0.57

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(\tan^{-1}(ax)^2-\frac{2\left(i\left(\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)-\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)\right)+\tan^{-1}(ax)\left(\log\left(1-ie^{i\tan^{-1}(ax)}\right)-\log\left(1+ie^{i\tan^{-1}(ax)}\right)\right)\right)}{\sqrt{a^2x^2+1}}\right)}{a^2c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(ArcTan[a*x]^2 - (2*(ArcTan[a*x]*(Log[1 - I*E^(I*Arc
Tan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + I*(PolyLog[2, (-I)*E^(I*ArcTan
[a*x])] - PolyLog[2, I*E^(I*ArcTan[a*x])])))/Sqrt[1 + a^2*x^2]))/(a^2*c)
```

fricas [F] time = 2.00, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x\arctan(ax)^2}{\sqrt{a^2cx^2+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(x*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.07, size = 180, normalized size = 0.82

$$\frac{\arctan(ax)^2\sqrt{c(ax-i)(ax+i)}}{a^2c} - \frac{2i\left(i\arctan(ax)\ln\left(1+\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-i\arctan(ax)\ln\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)+\mathrm{dilog}\left(1+\right.\right.}{\sqrt{a^2x^2+1}\,a^2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/a^2/c-2*I*(I*arctan(a*x)*ln(1+I*(1+
I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/
2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^2/c
```

maximaF [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \arctan (ax)^2}{\sqrt{a^2cx^2 + c}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x \operatorname{atan}(a\,x)^2}{\sqrt{c\,a^2\,x^2 + c}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{atan}^2(ax)}{\sqrt{c\left(a^2x^2 + 1\right)}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x*atan(a*x)**2/sqrt(c*(a**2*x**2 + 1)), x)
```

3.334 $\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=256

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\mathrm{Li}_3\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}+$$

```
[Out] -2*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a/
(a^2*c*x^2+c)^(1/2)+2*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2
))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-2*I*arctan(a*x)*polylog(2,I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-2*polylog(
3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+2
*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)
^(1/2)
```

Rubi [A] time = 0.15, antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4890, 4888, 4181, 2531, 2282, 6589}

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\mathrm{Po}}{a\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] ((-2*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a*Sqrt[
c + a^2*c*x^2]) + ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I
*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a
*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - (2*Sqrt[1 +
a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + (2*S
qrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^2}{\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int x^2\sec(x)\,dx, x, \tan^{-1}(ax)\right)}{a\sqrt{c+a^2cx^2}}$$
$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a\sqrt{c+a^2cx^2}} - \frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x\log\left(1-ie^{ix}\right)\,dx,\right.}{a\sqrt{c+a^2cx^2}}$$
$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a\sqrt{c+a^2cx^2}} + \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{c+a^2cx^2}} -$$
$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a\sqrt{c+a^2cx^2}} + \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{c+a^2cx^2}} -$$
$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a\sqrt{c+a^2cx^2}} + \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{c+a^2cx^2}} -$$

Mathematica [A] time = 0.12, size = 140, normalized size = 0.55

$$\frac{2\sqrt{c\left(a^2x^2+1\right)}\left(i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) - i\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right) - \text{Li}_3\left(-ie^{i\tan^{-1}(ax)}\right) + \text{Li}_3\left(ie^{i\tan^{-1}(a}\right.\right.}{ac\sqrt{a^2x^2+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^2/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (2*Sqrt[c*(1 + a^2*x^2)]*((-I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + I*
ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - I*ArcTan[a*x]*PolyLog[2, I
*E^(I*ArcTan[a*x])] - PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + PolyLog[3, I*E^(
I*ArcTan[a*x])]))/(a*c*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^2}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 0.58, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{\sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
[Out] int(arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{\sqrt{a^2cx^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)^2}{\sqrt{c\,a^2\,x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(c + a^2*c*x^2)^(1/2),x)
[Out] int(atan(a*x)^2/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^2(ax)}{\sqrt{c\left(a^2x^2 + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**2/sqrt(c*(a**2*x**2 + 1)), x)
```

3.335 $\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=227

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\text{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}$$

```
[Out] -2*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)+2*I*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a
^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*arctan(a*x)*polylog(2,(1+I*a*x)/(a^
2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*polylog(3,-(1+I*a*x
)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+2*polylog(3,(1+I
*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.25, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4958, 4956, 4183, 2531, 2282, 6589}

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\text{I}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^
2*c*x^2] + ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x
])])/Sqrt[c + a^2*c*x^2] - ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2,
E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (2*Sqrt[1 + a^2*x^2]*PolyLog[3, -
E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (2*Sqrt[1 + a^2*x^2]*PolyLog[3, E
^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx &= \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^2}{x\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}\\
&= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int x^2\csc(x)\,dx,x,\tan^{-1}(ax)\right)}{\sqrt{c+a^2cx^2}}\\
&= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} - \frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x\log\left(1-e^{ix}\right)\,dx,x\right.}{\sqrt{c+a^2cx^2}}\\
&= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} + \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} - \frac{2}{}\\
&= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} + \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} - \frac{2}{}\\
&= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} + \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} - \frac{2}{}
\end{aligned}
$$

Mathematica [A] time = 0.17, size = 145, normalized size = 0.64

$$
\frac{\sqrt{a^2x^2+1}\left(2i\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-2i\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)-2\text{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)+2\text{Li}_3\left(e^{i\tan^{-1}(ax)}\right)+\text{t}\right.}{\sqrt{c\left(a^2x^2+1\right)}}
$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*(ArcTan[a*x]^2*Log[1 - E^(I*ArcTan[a*x])] - ArcTan[a*x]^
2*Log[1 + E^(I*ArcTan[a*x])] + (2*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*
x])] - (2*I)*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] - 2*PolyLog[3, -E^(I
*ArcTan[a*x])] + 2*PolyLog[3, E^(I*ArcTan[a*x])]))/Sqrt[c*(1 + a^2*x^2)]
```

fricas [F] time = 0.79, size = 0, normalized size = 0.00

$$
\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{a^2cx^3+cx},x\right)
$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^2*c*x^3 + c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.77, size = 197, normalized size = 0.87

$$\frac{\left(\arctan(ax)^2\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-\arctan(ax)^2\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-2i\arctan(ax)\operatorname{polylog}\left(2,\frac{iax+1}{\sqrt{a^2x^2+1}}\right)+2i\operatorname{arcta}\right.}{\sqrt{a^2x^2+}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x/(a^2*c*x^2+c)^(1/2),x)
[Out] (arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)^2*ln(1+(1+I*a*
x)/(a^2*x^2+1)^(1/2))-2*I*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2)
)+2*I*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*polylog(3,(1+I*
a*x)/(a^2*x^2+1)^(1/2))-2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2
+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{\sqrt{a^2cx^2+c}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(arctan(a*x)^2/(sqrt(a^2*c*x^2 + c)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^2}{x\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^2(ax)}{x\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**2/(x*sqrt(c*(a**2*x**2 + 1))), x)
```

3.336 $\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=208

$$\frac{2ia\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2ia\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{cx}-\frac{4a\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tanh^{-}}{\sqrt{a^2cx^2+c}}$$

```
[Out] -4*a*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)
/(a^2*c*x^2+c)^(1/2)+2*I*a*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2
*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*I*a*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)
^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-arctan(a*x)^2*(a^2*c*x^2+c)^(
1/2)/c/x
```

Rubi [A] time = 0.25, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.125, Rules used = {4944, 4958, 4954}

$$\frac{2ia\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{2ia\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{cx}-\frac{4a\sqrt{a^2x^2+1}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(c*x)) - (4*a*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*ArcTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] + ((2*
I)*a*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt
[c + a^2*c*x^2] - ((2*I)*a*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqr
t[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{cx} + (2a)\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx$$
$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{cx} + \frac{\left(2a\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)}{x\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}$$
$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{cx} - \frac{4a\sqrt{1+a^2x^2}\,\tan^{-1}(ax)\tanh^{-1}\left(\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{c+a^2cx^2}} + \frac{2ia\sqrt{1+a^2x^2}\,\mathrm{Li}}{\sqrt{c+a^2}}$$

Mathematica [A] time = 0.43, size = 128, normalized size = 0.62

$$-\frac{a\sqrt{a^2x^2+1}\left(\tan^{-1}(ax)\left(\frac{\sqrt{a^2x^2+1}\,\tan^{-1}(ax)}{ax} - 2\log\left(1-e^{i\tan^{-1}(ax)}\right) + 2\log\left(1+e^{i\tan^{-1}(ax)}\right)\right) - 2i\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)\right.}{\sqrt{c\left(a^2x^2+1\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((a*Sqrt[1 + a^2*x^2]*(ArcTan[a*x]*((Sqrt[1 + a^2*x^2]*ArcTan[a*x])/(a*x)
- 2*Log[1 - E^(I*ArcTan[a*x])] + 2*Log[1 + E^(I*ArcTan[a*x])]) - (2*I)*Poly
Log[2, -E^(I*ArcTan[a*x])] + (2*I)*PolyLog[2, E^(I*ArcTan[a*x])]))/Sqrt[c*(
1 + a^2*x^2)])
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{a^2cx^4+cx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^2*c*x^4 + c*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.77, size = 171, normalized size = 0.82

$$-\frac{\arctan(ax)^2\sqrt{c(ax-i)(ax+i)}}{cx} - \frac{2ia\left(-i\arctan(ax)\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right) + i\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)\arctan(ax) + \mathrm{pol}\right.}{\sqrt{a^2x^2+1}\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/c/x-2*I*a*(-I*ln(1+(1+I*a*x)/(a^2*
x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+p
```

```
olylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2
)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{\sqrt{a^2cx^2+c}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(arctan(a*x)^2/(sqrt(a^2*c*x^2 + c)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x^2\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{atan}^2(ax)}{x^2\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**2/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**2/(x**2*sqrt(c*(a**2*x**2 + 1))), x)
```

3.337 $\int \frac{\tan^{-1}(ax)^2}{x^3\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=328

$$-\frac{ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{a^2\sqrt{a^2x^2+1}\,\text{Li}_3\left(-e^{i\tan^{-1}\right.}}{\sqrt{a^2cx^2+c}}$$

```
[Out] -a^2*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(1/2)+a^2*arctan(a*x)^2*arctanh
((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-I*a^2*a
rctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c
*x^2+c)^(1/2)+I*a^2*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2
*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+a^2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2
))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a^2*polylog(3,(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a*arctan(a*x)*(a^2*c*x^2+c)^
(1/2)/c/x-1/2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c/x^2
```

Rubi [A] time = 0.48, antiderivative size = 328, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4962, 4944, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589}

$$-\frac{ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{a^2\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(c*x)) - (Sqrt[c + a^2*c*x^2]*ArcTan[
a*x]^2)/(2*c*x^2) + (a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTa
n[a*x])])/Sqrt[c + a^2*c*x^2] - (a^2*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]])/
Sqrt[c] - (I*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x]
)])/Sqrt[c + a^2*c*x^2] + (I*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E
^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (a^2*Sqrt[1 + a^2*x^2]*PolyLog[3,
-E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (a^2*Sqrt[1 + a^2*x^2]*PolyLog[3
, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^3\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} + a\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx - \frac{1}{2}a^2\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} + a^2\int \frac{1}{x\sqrt{c+a^2cx^2}}\,dx - \frac{\left(a^2\sqrt{1+\right.}{}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} + \frac{1}{2}a^2\,\mathrm{Subst}\left(\int \frac{1}{x\sqrt{c+a^2cx}}\,dx, x,\right.$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} + \frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(\right.}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} + \frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(\right.}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} + \frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(\right.}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} + \frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(\right.}{\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 1.23, size = 231, normalized size = 0.70

$$a^2\sqrt{a^2x^2+1}\left(-8i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)+8i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+8\mathrm{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)-8\mathrm{Li}_3\left(e^{i\tan^{-1}(\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (a^2*Sqrt[1 + a^2*x^2]*(-4*ArcTan[a*x]*Cot[ArcTan[a*x]/2] - ArcTan[a*x]^2*C
sc[ArcTan[a*x]/2]^2 - 4*ArcTan[a*x]^2*Log[1 - E^(I*ArcTan[a*x])] + 4*ArcTan
[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + 8*Log[Tan[ArcTan[a*x]/2]] - (8*I)*ArcT
an[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] + (8*I)*ArcTan[a*x]*PolyLog[2, E^(I*
ArcTan[a*x])] + 8*PolyLog[3, -E^(I*ArcTan[a*x])] - 8*PolyLog[3, E^(I*ArcTan
[a*x])] + ArcTan[a*x]^2*Sec[ArcTan[a*x]/2]^2 - 4*ArcTan[a*x]*Tan[ArcTan[a*x
]/2]))/(8*Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 1.25, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{a^2cx^5+cx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^2*c*x^5 + c*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.30, size = 261, normalized size = 0.80

$$-\frac{(2ax+\arctan(ax))\arctan(ax)\sqrt{c(ax-i)(ax+i)}}{2x^2c}-\frac{a^2\left(-2i\arctan(ax)\operatorname{polylog}\left(2,\frac{iax+1}{\sqrt{a^2x^2+1}}\right)+2i\arctan(ax)\operatorname{p}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -1/2*(2*a*x+arctan(a*x))*arctan(a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/x^2/c-1/2*a^
2*(-2*I*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*arctan(a*x)*
polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x
^2+1)^(1/2))-arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*polylog(3,(1
+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+4*arct
anh((1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/
2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^2}{\sqrt{a^2cx^2+c}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/(sqrt(a^2*c*x^2 + c)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^2}{x^3\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^2(ax)}{x^3\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**2/(x**3*sqrt(c*(a**2*x**2 + 1))), x)
```

3.338 $\int \frac{\tan^{-1}(ax)^2}{x^4\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=311

$$-\frac{a^2\sqrt{a^2cx^2+c}}{3cx}+\frac{2a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{3cx}-\frac{a\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3cx^2}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{3cx^3}-\frac{5ia^3\sqrt{a^2x^2+1}}{3\sqrt{a^2c}}$$

```
[Out] 10/3*a^3*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(
1/2)/(a^2*c*x^2+c)^(1/2)-5/3*I*a^3*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/
2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+5/3*I*a^3*polylog(2,(1+I*a*x)^(1/
2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/3*a^2*(a^2*c*x^
2+c)^(1/2)/c/x-1/3*a*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/c/x^2-1/3*arctan(a*x)^
2*(a^2*c*x^2+c)^(1/2)/c/x^3+2/3*a^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c/x
```

Rubi [A] time = 0.63, antiderivative size = 311, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4962, 264, 4958, 4954, 4944}

$$-\frac{5ia^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}+\frac{5ia^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3\sqrt{a^2cx^2+c}}-\frac{a^2\sqrt{a^2cx^2+c}}{3cx}+\frac{2a^2\sqrt{a^2cx^2+c}}{3cx}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -(a^2*Sqrt[c + a^2*c*x^2])/(3*c*x) - (a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(3
*c*x^2) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(3*c*x^3) + (2*a^2*Sqrt[c + a
^2*c*x^2]*ArcTan[a*x]^2)/(3*c*x) + (10*a^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Ar
cTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(3*Sqrt[c + a^2*c*x^2]) - (((5*I)/3
)*a^3*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqr
t[c + a^2*c*x^2] + (((5*I)/3)*a^3*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a
*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^4\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3cx^3} + \frac{1}{3}(2a)\int \frac{\tan^{-1}(ax)}{x^3\sqrt{c+a^2cx^2}}\,dx - \frac{1}{3}\left(2a^2\right)\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3cx^3} + \frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3cx} + \frac{1}{3}a^2\int$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}}{3cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3cx^3} + \frac{2a^2\sqrt{c+a^2cx^2}\,\tan}{3cx}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}}{3cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3cx^3} + \frac{2a^2\sqrt{c+a^2cx^2}\,\tan}{3cx}$$

Mathematica [A] time = 2.70, size = 228, normalized size = 0.73

$$\frac{a^3\sqrt{a^2cx^2+c}\left(\frac{\left(a^2x^2+1\right)^{3/2}\left(\tan^{-1}(ax)\left(-2\sin\left(2\tan^{-1}(ax)\right)+\frac{5\left(\log\left(1-e^{i\tan^{-1}(ax)}\right)-\log\left(1+e^{i\tan^{-1}(ax)}\right)\right)\left(\sqrt{a^2x^2+1}\,\sin\left(3\tan^{-1}(ax)\right)-3ax\right)}{\sqrt{a^2x^2+1}}\right)+\frac{20ia^3x^3\text{Li}_2\left(e^{i\tan}\right.}{\left(a^2x^2+1\right)^3}\right.}{a^3x^3}\right.}{12c\sqrt{a^2x^2+1}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (a^3*Sqrt[c + a^2*c*x^2]*((-20*I)*PolyLog[2, -E^(I*ArcTan[a*x])] + ((1 + a^
2*x^2)^(3/2)*(ArcTan[a*x]^2*(2 - 6*Cos[2*ArcTan[a*x]]) + 2*(-1 + Cos[2*ArcT
an[a*x]]) + ((20*I)*a^3*x^3*PolyLog[2, E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3
/2) + ArcTan[a*x]*(-2*Sin[2*ArcTan[a*x]] + (5*(Log[1 - E^(I*ArcTan[a*x])] -
 Log[1 + E^(I*ArcTan[a*x])])*(-3*a*x + Sqrt[1 + a^2*x^2]*Sin[3*ArcTan[a*x]]
))/Sqrt[1 + a^2*x^2])))/(a^3*x^3)))/(12*c*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{a^2cx^6+cx^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^2*c*x^6 + c*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.18, size = 206, normalized size = 0.66

$$\frac{\left(2\arctan\left(ax\right)^{2}x^{2}a^{2}-a^{2}x^{2}-\arctan\left(ax\right)xa-\arctan\left(ax\right)^{2}\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{3c\,x^{3}}+\frac{5ia^{3}\left(-i\arctan\left(ax\right)\ln\left(1+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/3*(2*arctan(a*x)^2*x^2*a^2-a^2*x^2-arctan(a*x)*x*a-arctan(a*x)^2)*(c*(a*x
-I)*(I+a*x))^(1/2)/c/x^3+5/3*I*a^3*(-I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*ar
ctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+polylog(2,(1+I*a*
x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^
(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{2}}{\sqrt{a^{2}cx^{2}+c}\,x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/(sqrt(a^2*c*x^2 + c)*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{2}}{x^{4}\,\sqrt{c\,a^{2}\,x^{2}+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{2}\left(ax\right)}{x^{4}\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**4/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**2/(x**4*sqrt(c*(a**2*x**2 + 1))), x)
```

3.339 $\int \frac{x^3 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}} \, dx$

Optimal. Leaf size=305

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{a^4c^2}-\frac{2i\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^4c\sqrt{a^2cx^2+c}}+\frac{2i\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^4c\sqrt{a^2cx^2+c}}-\frac{2}{a^4c\sqrt{a^2cx^2+c}}+\frac{\tan^{-1}(ax)^2}{a^4c\sqrt{a^2cx^2+c}}$$

```
[Out] -2/a^4/c/(a^2*c*x^2+c)^(1/2)-2*x*arctan(a*x)/a^3/c/(a^2*c*x^2+c)^(1/2)+arct
an(a*x)^2/a^4/c/(a^2*c*x^2+c)^(1/2)+4*I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/
(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/c/(a^2*c*x^2+c)^(1/2)-2*I*polylog(2,
-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/c/(a^2*c*x^2+c)^(
1/2)+2*I*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^4
/c/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^4/c^2
```

Rubi [A] time = 0.40, antiderivative size = 305, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4964, 4930, 4890, 4886, 4894}

$$-\frac{2i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^4c\sqrt{a^2cx^2+c}}+\frac{2i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^4c\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{a^4c^2}-\frac{2}{a^4c\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -2/(a^4*c*Sqrt[c + a^2*c*x^2]) - (2*x*ArcTan[a*x])/(a^3*c*Sqrt[c + a^2*c*x^
2]) + ArcTan[a*x]^2/(a^4*c*Sqrt[c + a^2*c*x^2]) + (Sqrt[c + a^2*c*x^2]*ArcT
an[a*x]^2)/(a^4*c^2) + ((4*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 +
 I*a*x]/Sqrt[1 - I*a*x]])/(a^4*c*Sqrt[c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2
*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^4*c*Sqrt[c + a
^2*c*x^2]) + ((2*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1
 - I*a*x]])/(a^4*c*Sqrt[c + a^2*c*x^2])
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx = -\frac{\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2} + \frac{\int \frac{x\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{a^2c}$$

$$= \frac{\tan^{-1}(ax)^2}{a^4c\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{a^4c^2} - \frac{2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^3} - \frac{2\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{a^3c}$$

$$= -\frac{2}{a^4c\sqrt{c+a^2cx^2}} - \frac{2x\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^2}{a^4c\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{a^4c^2} - \frac{\left(2\sqrt{1\right.}}{}$$

$$= -\frac{2}{a^4c\sqrt{c+a^2cx^2}} - \frac{2x\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^2}{a^4c\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{a^4c^2} + \frac{4i\sqrt{1}}{}$$

Mathematica [A] time = 0.87, size = 209, normalized size = 0.69

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{4i\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + \frac{4i\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} - \frac{4\tan^{-1}(ax)\log\left(1-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + \frac{4\tan^{-1}(ax)\log\left(1+ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + 3\tan\right.}{2a^4c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(-2 + 3*ArcTan[a*x]^2 - 2*Cos[2*ArcTan[a*x]] + ArcTa
n[a*x]^2*Cos[2*ArcTan[a*x]] - (4*ArcTan[a*x]*Log[1 - I*E^(I*ArcTan[a*x])])/
Sqrt[1 + a^2*x^2] + (4*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a
^2*x^2] - ((4*I)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((
4*I)*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - 2*ArcTan[a*x]*Sin
[2*ArcTan[a*x]]))/(2*a^4*c^2)
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3\arctan\left(ax\right)^2}{a^4c^2x^4+2\,a^2c^2x^2+c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3*arctan(a*x)^2/(a^4*c^2*x^4 + 2*a^2*c^2*x^2
 + c^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.78, size = 294, normalized size = 0.96

$$\frac{\left(\arctan\left(ax\right)^{2}-2+2i\arctan\left(ax\right)\right)\left(iax+1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^{2}x^{2}+1\right)a^{4}c^{2}}-\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(iax-1\right)\left(\arctan\left(ax\right)^{2}-2\right.}{2\left(a^{2}x^{2}+1\right)a^{4}c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(arctan(a*x)^2-2+2*I*arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/(
a^2*x^2+1)/a^4/c^2-1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2-
2-2*I*arctan(a*x))/(a^2*x^2+1)/a^4/c^2+arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1
/2)/a^4/c^2-2*I*(I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan
(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))-dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*
(I+a*x))^(1/2)/a^4/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}\arctan\left(ax\right)^{2}}{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^{3}\,\mathrm{atan}\left(a\,x\right)^{2}}{\left(c\,a^{2}\,x^{2}+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}\operatorname{atan}^{2}\left(ax\right)}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**3*atan(a*x)**2/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.340 $\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}} \, dx$

Optimal. Leaf size=349

$$\frac{2x}{a^2c\sqrt{a^2cx^2+c}}-\frac{x\tan^{-1}(ax)^2}{a^2c\sqrt{a^2cx^2+c}}+\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}\right.}}{a^3c\sqrt{a^2cx^2+c}}$$

```
[Out] 2*x/a^2/c/(a^2*c*x^2+c)^(1/2)-2*arctan(a*x)/a^3/c/(a^2*c*x^2+c)^(1/2)-x*arc
tan(a*x)^2/a^2/c/(a^2*c*x^2+c)^(1/2)-2*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)
)*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)+2*I*arctan(a*x)
*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x
^2+c)^(1/2)-2*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x
^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)-2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)+2*polylog(3,I*(1+I*a*x)/
(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.34, antiderivative size = 349, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4964, 4890, 4888, 4181, 2531, 2282, 6589, 4898, 191}

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (2*x)/(a^2*c*Sqrt[c + a^2*c*x^2]) - (2*ArcTan[a*x])/(a^3*c*Sqrt[c + a^2*c*x
^2]) - (x*ArcTan[a*x]^2)/(a^2*c*Sqrt[c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2*
x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^3*c*Sqrt[c + a^2*c*x^2]) +
 ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(
a^3*c*Sqrt[c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2
, I*E^(I*ArcTan[a*x])])/(a^3*c*Sqrt[c + a^2*c*x^2]) - (2*Sqrt[1 + a^2*x^2]*
PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a^3*c*Sqrt[c + a^2*c*x^2]) + (2*Sqrt[1
 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^3*c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx = -\frac{\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2} + \frac{\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{a^2c}$$

$$= -\frac{2\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}} + \frac{2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2} + \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^2}{\sqrt{1+a^2x^2}}\,dx}{a^2c\sqrt{c+a^2cx^2}}$$

$$= \frac{2x}{a^2c\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int x^2\sec(x)\,dx\right.}{a^3c\sqrt{c+a^2cx^2}}$$

$$= \frac{2x}{a^2c\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\text{ta}}{a^3c\sqrt{c+a^2cx^2}}$$

$$= \frac{2x}{a^2c\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\text{ta}}{a^3c\sqrt{c+a^2cx^2}}$$

$$= \frac{2x}{a^2c\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\text{ta}}{a^3c\sqrt{c+a^2cx^2}}$$

$$= \frac{2x}{a^2c\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\text{ta}}{a^3c\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.36, size = 228, normalized size = 0.65

$$-\frac{\sqrt{a^2x^2+1}\left(-\frac{2ax}{\sqrt{a^2x^2+1}} + \frac{ax\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}} + \frac{2\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} - 2i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) + 2i\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right.\right.}{a^3c\sqrt{c}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -((Sqrt[1 + a^2*x^2]*((-2*a*x)/Sqrt[1 + a^2*x^2] + (2*ArcTan[a*x])/Sqrt[1 +
 a^2*x^2] + (a*x*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] - ArcTan[a*x]^2*Log[1 - I
*E^(I*ArcTan[a*x])] + ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] - (2*I)*Ar
cTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (2*I)*ArcTan[a*x]*PolyLog[2,
 I*E^(I*ArcTan[a*x])] + 2*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 2*PolyLog[3,
 I*E^(I*ArcTan[a*x])]))/(a^3*c*Sqrt[c*(1 + a^2*x^2)]))
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2\arctan\left(ax\right)^2}{a^4c^2x^4+2\,a^2c^2x^2+c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)^2/(a^4*c^2*x^4 + 2*a^2*c^2*x^2
 + c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 2.72, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)^2}{(a^2c\,x^2+c)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)^2}{(a^2cx^2+c)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\mathrm{atan}(a\,x)^2}{(c\,a^2\,x^2+c)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\,\mathrm{atan}^2(ax)}{(c(a^2x^2+1))^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**2/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.341 $\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=78

$$\frac{2}{a^2c\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^2}{a^2c\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)}{ac\sqrt{a^2cx^2+c}}$$

```
[Out] 2/a^2/c/(a^2*c*x^2+c)^(1/2)+2*x*arctan(a*x)/a/c/(a^2*c*x^2+c)^(1/2)-arctan(
a*x)^2/a^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 78, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.091, Rules used = {4930, 4894}

$$\frac{2}{a^2c\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^2}{a^2c\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)}{ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] 2/(a^2*c*Sqrt[c + a^2*c*x^2]) + (2*x*ArcTan[a*x])/(a*c*Sqrt[c + a^2*c*x^2])
 - ArcTan[a*x]^2/(a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx&=-\frac{\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}}+\frac{2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a}\\&=\frac{2}{a^2c\sqrt{c+a^2cx^2}}+\frac{2x\tan^{-1}(ax)}{ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^2}{a^2c\sqrt{c+a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.08, size = 50, normalized size = 0.64

$$\frac{\sqrt{a^2cx^2+c}\left(-\tan^{-1}(ax)^2+2ax\tan^{-1}(ax)+2\right)}{a^2c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(2 + 2*a*x*ArcTan[a*x] - ArcTan[a*x]^2))/(a^2*c^2*(1 +
 a^2*x^2))
```

fricas [A] time = 0.87, size = 51, normalized size = 0.65

$$\frac{\sqrt{a^2cx^2 + c}\left(2\,ax\arctan\left(ax\right) - \arctan\left(ax\right)^2 + 2\right)}{a^4c^2x^2 + a^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(a^2*c*x^2 + c)*(2*a*x*arctan(a*x) - arctan(a*x)^2 + 2)/(a^4*c^2*x^2 +
a^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.88, size = 116, normalized size = 1.49

$$-\frac{\left(\arctan\left(ax\right)^2 - 2 + 2i\arctan\left(ax\right)\right)\left(iax + 1\right)\sqrt{c\left(ax - i\right)\left(ax + i\right)}}{2\left(a^2x^2 + 1\right)c^2a^2} + \frac{\sqrt{c\left(ax - i\right)\left(ax + i\right)}\;\left(iax - 1\right)\left(\arctan\left(ax\right)^2 - 2\right.}{2\left(a^2x^2 + 1\right)c^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*(arctan(a*x)^2-2+2*I*arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/
(a^2*x^2+1)/c^2/a^2+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2
-2-2*I*arctan(a*x))/(a^2*x^2+1)/c^2/a^2
```

maxima [A] time = 0.72, size = 73, normalized size = 0.94

$$\sqrt{c}\left(\frac{2\,x\arctan\left(ax\right)}{\sqrt{a^2x^2 + 1}\,ac^2} - \frac{\arctan\left(ax\right)^2}{\sqrt{a^2x^2 + 1}\,a^2c^2} + \frac{2}{\sqrt{a^2x^2 + 1}\,a^2c^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] sqrt(c)*(2*x*arctan(a*x)/(sqrt(a^2*x^2 + 1)*a*c^2) - arctan(a*x)^2/(sqrt(a^
2*x^2 + 1)*a^2*c^2) + 2/(sqrt(a^2*x^2 + 1)*a^2*c^2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^2}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{atan}^2(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x*atan(a*x)**2/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.342 $\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=72

$$-\frac{2x}{c\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^2}{c\sqrt{a^2cx^2+c}}+\frac{2\tan^{-1}(ax)}{ac\sqrt{a^2cx^2+c}}$$

```
[Out] -2*x/c/(a^2*c*x^2+c)^(1/2)+2*arctan(a*x)/a/c/(a^2*c*x^2+c)^(1/2)+x*arctan(a
*x)^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.05, antiderivative size = 72, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {4898, 191}

$$-\frac{2x}{c\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^2}{c\sqrt{a^2cx^2+c}}+\frac{2\tan^{-1}(ax)}{ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (-2*x)/(c*Sqrt[c + a^2*c*x^2]) + (2*ArcTan[a*x])/(a*c*Sqrt[c + a^2*c*x^2])
 + (x*ArcTan[a*x]^2)/(c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx &= \frac{2\tan^{-1}(ax)}{ac\sqrt{c+a^2cx^2}}+\frac{x\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}-2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx\\ &= -\frac{2x}{c\sqrt{c+a^2cx^2}}+\frac{2\tan^{-1}(ax)}{ac\sqrt{c+a^2cx^2}}+\frac{x\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.06, size = 49, normalized size = 0.68

$$\frac{\sqrt{a^2cx^2+c}\left(-2ax+ax\tan^{-1}(ax)^2+2\tan^{-1}(ax)\right)}{c^2\left(a^3x^2+a\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^2/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-2*a*x + 2*ArcTan[a*x] + a*x*ArcTan[a*x]^2))/(c^2*(a
 + a^3*x^2))
```

fricas [A] time = 0.67, size = 51, normalized size = 0.71

$$\frac{\sqrt{a^2cx^2+c}\left(ax\arctan\left(ax\right)^2-2\,ax+2\,\arctan\left(ax\right)\right)}{a^3c^2x^2+ac^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(a^2*c*x^2 + c)*(a*x*arctan(a*x)^2 - 2*a*x + 2*arctan(a*x))/(a^3*c^2*x^
2 + a*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.45, size = 114, normalized size = 1.58

$$\frac{\left(\arctan\left(ax\right)^2-2+2i\arctan\left(ax\right)\right)\left(ax-i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^2x^2+1\right)c^2a}+\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(ax+i\right)\left(\arctan\left(ax\right)^2-2\right.}{2\left(a^2x^2+1\right)c^2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(arctan(a*x)^2-2+2*I*arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^
2*x^2+1)/c^2/a+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^2-2-2*I*a
rctan(a*x))/(a^2*x^2+1)/c^2/a
```

maxima [A] time = 0.49, size = 53, normalized size = 0.74

$$\frac{x\arctan\left(ax\right)^2}{\sqrt{a^2cx^2+c}\,c}-\frac{2\left(ax-\arctan\left(ax\right)\right)}{\sqrt{a^2x^2+1}\,ac^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] x*arctan(a*x)^2/(sqrt(a^2*c*x^2 + c)*c) - 2*(a*x - arctan(a*x))/(sqrt(a^2*x
^2 + 1)*a*c^(3/2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{\mathrm{atan}\left(a\,x\right)^2}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^2/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\operatorname{atan}^2\left(ax\right)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**2/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.343 $\int \frac{\tan^{-1}(ax)^2}{x(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=310

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\text{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}$$

```
[Out] -2/c/(a^2*c*x^2+c)^(1/2)-2*a*x*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)+arctan(a*x
)^2/c/(a^2*c*x^2+c)^(1/2)-2*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)+2*I*arctan(a*x)*polylog(2,-(1+I
*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-2*I*arctan
(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2
+c)^(1/2)-2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^
2*c*x^2+c)^(1/2)+2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)
/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.51, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4966, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4894}

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\text{I}}{c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] -2/(c*Sqrt[c + a^2*c*x^2]) - (2*a*x*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2]) +
ArcTan[a*x]^2/(c*Sqrt[c + a^2*c*x^2]) - (2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*
ArcTanh[E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) + ((2*I)*Sqrt[1 + a^2*x
^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) - (
(2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/(c*Sqrt[
c + a^2*c*x^2]) - (2*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/(c*S
qrt[c + a^2*c*x^2]) + (2*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/(
c*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
```

```
[m, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - (2a)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx + \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^2}{x\sqrt{1+a^2x^2}}\,dx}{c\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{c\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int x^2\csc(x)\,dx, x\right.}{c\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{c\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\,\text{ta}}\right.}{c\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{c\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\,\text{ta}}\right.}{c\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{c\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\,\text{ta}}\right.}{c\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{c\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\,\text{ta}}\right.}{c\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.31, size = 204, normalized size = 0.66

$$\frac{\sqrt{a^2x^2+1}\left(-\frac{2}{\sqrt{a^2x^2+1}}+\frac{\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}}-\frac{2ax\tan^{-1}(ax)}{\sqrt{a^2x^2+1}}+2i\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-2i\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)-\right.}{c\sqrt{c\left(a^2x^2\right.}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*(-2/Sqrt[1 + a^2*x^2] - (2*a*x*ArcTan[a*x])/Sqrt[1 + a^2
*x^2] + ArcTan[a*x]^2/Sqrt[1 + a^2*x^2] + ArcTan[a*x]^2*Log[1 - E^(I*ArcTan
[a*x])] - ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + (2*I)*ArcTan[a*x]*Poly
Log[2, -E^(I*ArcTan[a*x])] - (2*I)*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])
] - 2*PolyLog[3, -E^(I*ArcTan[a*x])] + 2*PolyLog[3, E^(I*ArcTan[a*x])]))/(c
*Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{a^4c^2x^5+2\,a^2c^2x^3+c^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c
^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.77, size = 306, normalized size = 0.99

$$\frac{\left(\arctan (ax)^2-2+2i\arctan (ax)\right)(iax+1)\sqrt{c\,(ax-i)\,(ax+i)}}{2\left(a^2x^2+1\right)c^2}-\frac{\sqrt{c\,(ax-i)\,(ax+i)}\;(iax-1)\left(\arctan (ax)^2-2\right.}{2\left(a^2x^2+1\right)c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(arctan(a*x)^2-2+2*I*arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/(
a^2*x^2+1)/c^2-1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2-2-2*
I*arctan(a*x))/(a^2*x^2+1)/c^2+(arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1
/2))-arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*arctan(a*x)*polylo
g(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*
x^2+1)^(1/2))+2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog(3,-(1+I*a*
x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan (ax)^2}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^(3/2)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**2/(x*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.344 $\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=293

$$-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{c^2x}+\frac{2ia\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}-\frac{2ia\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}+\frac{2a^2x}{c\sqrt{a^2cx^2+c}}-\frac{a^2x\tan^{-1}(}{c\sqrt{a^2cx^2}}$$

```
[Out] 2*a^2*x/c/(a^2*c*x^2+c)^(1/2)-2*a*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)-a^2*x*a
rctan(a*x)^2/c/(a^2*c*x^2+c)^(1/2)-4*a*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/
(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)+2*I*a*polylog(2,-(
1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-2*I
*a*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^
2+c)^(1/2)-arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c^2/x
```

Rubi [A] time = 0.43, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4966, 4944, 4958, 4954, 4898, 191}

$$\frac{2ia\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}-\frac{2ia\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{c^2x}+\frac{2a^2x}{c\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (2*a^2*x)/(c*Sqrt[c + a^2*c*x^2]) - (2*a*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2
]) - (a^2*x*ArcTan[a*x]^2)/(c*Sqrt[c + a^2*c*x^2]) - (Sqrt[c + a^2*c*x^2]*A
rcTan[a*x]^2)/(c^2*x) - (4*a*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1 +
 I*a*x]/Sqrt[1 - I*a*x]])/(c*Sqrt[c + a^2*c*x^2]) + ((2*I)*a*Sqrt[1 + a^2*x
^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/(c*Sqrt[c + a^2*c*x^2])
 - ((2*I)*a*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/
(c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{2a\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{a^2x\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{c^2x}+\left(2a^2\right)\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

$$= \frac{2a^2x}{c\sqrt{c+a^2cx^2}}-\frac{2a\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{a^2x\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{c^2x}+\frac{\left(2a\sqrt{1+a^2 \cdots\right.}{c\sqrt{\cdots}}$$

$$= \frac{2a^2x}{c\sqrt{c+a^2cx^2}}-\frac{2a\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{a^2x\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{c^2x}-\frac{4a\sqrt{1+a^2x \cdots}}{\cdots}$$

Mathematica [A] time = 1.12, size = 226, normalized size = 0.77

$$\frac{a\left(4i\sqrt{a^2x^2+1}\,\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)-4i\sqrt{a^2x^2+1}\,\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+4\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\log\left(1-e^{i\tan^{-1}(ax)}\right)-4\sqrt{a \cdots\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (a*(4*a*x - 4*ArcTan[a*x] - 2*a*x*ArcTan[a*x]^2 - (a*x*ArcTan[a*x]^2*Csc[Ar
cTan[a*x]/2]^2)/2 + 4*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x
])] - 4*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] + (4*I)*Sq
rt[1 + a^2*x^2]*PolyLog[2, -E^(I*ArcTan[a*x])] - (4*I)*Sqrt[1 + a^2*x^2]*Po
lyLog[2, E^(I*ArcTan[a*x])] - (2*(1 + a^2*x^2)*ArcTan[a*x]^2*Sin[ArcTan[a*x
]/2]^2)/(a*x)))/(2*c*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{a^4c^2x^6+2\,a^2c^2x^4+c^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c
^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.76, size = 279, normalized size = 0.95

$$-\frac{a\left(\arctan\left(ax\right)^{2}-2+2i\arctan\left(ax\right)\right)\left(ax-i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^{2}x^{2}+1\right)c^{2}}-\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(ax+i\right)\left(\arctan\left(ax\right)^{2}\right.}{2\left(a^{2}x^{2}+1\right)c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*a*(arctan(a*x)^2-2+2*I*arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/
(a^2*x^2+1)/c^2-1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^2-2-2*I*
arctan(a*x))*a/(a^2*x^2+1)/c^2-arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/x/c^
2-2*I*a*(-I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/
(a^2*x^2+1)^(1/2))*arctan(a*x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polyl
og(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(
1/2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{2}}{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^(3/2)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**2/(x**2*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.345 $\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=422

$$-\frac{a^2\tanh^{-1}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{c}}\right)}{c^{3/2}}-\frac{a\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{c^2x}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{2c^2x^2}-\frac{3ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan}\right.}{c\sqrt{a^2cx^2+c}}$$

```
[Out] -a^2*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(3/2)+2*a^2/c/(a^2*c*x^2+c)^(1/
2)+2*a^3*x*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)-a^2*arctan(a*x)^2/c/(a^2*c*x^2
+c)^(1/2)+3*a^2*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2
+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-3*I*a^2*arctan(a*x)*polylog(2,-(1+I*a*x)/(a
^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)+3*I*a^2*arctan(a*x
)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^
(1/2)+3*a^2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^
2*c*x^2+c)^(1/2)-3*a^2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(
1/2)/c/(a^2*c*x^2+c)^(1/2)-a*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/c^2/x-1/2*arct
an(a*x)^2*(a^2*c*x^2+c)^(1/2)/c^2/x^2
```

Rubi [A] time = 1.13, antiderivative size = 422, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 14, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4966, 4962, 4944, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4894}

$$-\frac{3ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}+\frac{3ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}+\frac{3a^2\sqrt{a}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (2*a^2)/(c*Sqrt[c + a^2*c*x^2]) + (2*a^3*x*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x
^2]) - (a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(c^2*x) - (a^2*ArcTan[a*x]^2)/(c
*Sqrt[c + a^2*c*x^2]) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*c^2*x^2) + (
3*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/(c*Sqrt[c
 + a^2*c*x^2]) - (a^2*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]])/c^(3/2) - ((3*I
)*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/(c*Sqrt
[c + a^2*c*x^2]) + ((3*I)*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I
*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) + (3*a^2*Sqrt[1 + a^2*x^2]*PolyLog[
3, -E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) - (3*a^2*Sqrt[1 + a^2*x^2]*
PolyLog[3, E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2])
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^3\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^{3/2}}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^3\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2c^2x^2} + a^4\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx + \frac{a\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,dx}{c} - \frac{a^2\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}}{2c}$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x} - \frac{a^2\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2c^2x^2} + \left(2a^3\right)\int \frac{\tan^{-1}(}{\left(c+a^2c\right.}$$

$$= \frac{2a^2}{c\sqrt{c+a^2cx^2}} + \frac{2a^3x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x} - \frac{a^2\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}}{2c}$$

$$= \frac{2a^2}{c\sqrt{c+a^2cx^2}} + \frac{2a^3x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x} - \frac{a^2\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}}{2c}$$

$$= \frac{2a^2}{c\sqrt{c+a^2cx^2}} + \frac{2a^3x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x} - \frac{a^2\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}}{2c}$$

$$= \frac{2a^2}{c\sqrt{c+a^2cx^2}} + \frac{2a^3x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x} - \frac{a^2\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}}{2c}$$

$$= \frac{2a^2}{c\sqrt{c+a^2cx^2}} + \frac{2a^3x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{c^2x} - \frac{a^2\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}}{2c}$$

Mathematica [A] time = 2.39, size = 371, normalized size = 0.88

$$\frac{a^2\left(-24i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) + 24i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right) + 24\sqrt{a^2x^2+1}\,\mathrm{Li}_3\left(-e^{i\tan}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^3*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (a^2*(16 + 16*a*x*ArcTan[a*x] - 8*ArcTan[a*x]^2 - 2*a*x*ArcTan[a*x]*Csc[Arc
Tan[a*x]/2]^2 - Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Csc[ArcTan[a*x]/2]^2 - 12*S
qrt[1 + a^2*x^2]*ArcTan[a*x]^2*Log[1 - E^(I*ArcTan[a*x])] + 12*Sqrt[1 + a^2
*x^2]*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + 8*Sqrt[1 + a^2*x^2]*Log[Ta
n[ArcTan[a*x]/2]] - (24*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*A
rcTan[a*x])] + (24*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[
a*x])] + 24*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])] - 24*Sqrt[1 +
a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])] + Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Se
c[ArcTan[a*x]/2]^2 - 4*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Tan[ArcTan[a*x]/2]))/(
8*c*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{a^4c^2x^7+2\,a^2c^2x^5+c^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c
^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.44, size = 376, normalized size = 0.89

$$-\frac{a^2\left(\arctan(ax)^2-2+2i\arctan(ax)\right)(iax+1)\sqrt{c(ax-i)(ax+i)}}{2\left(a^2x^2+1\right)c^2}+\frac{\sqrt{c(ax-i)(ax+i)}\ (iax-1)\left(\arctan(ax\right.}{2\left(a^2x^2+1\right)c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*a^2*(arctan(a*x)^2-2+2*I*arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1
/2)/(a^2*x^2+1)/c^2+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2
-2-2*I*arctan(a*x))*a^2/(a^2*x^2+1)/c^2-1/2*(2*a*x+arctan(a*x))*arctan(a*x)
*(c*(a*x-I)*(I+a*x))^(1/2)/c^2/x^2-1/2*a^2*(3*arctan(a*x)^2*ln(1-(1+I*a*x)/
(a^2*x^2+1)^(1/2))-6*I*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)-3
*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*polylog(2,-(1+I*a*x)/(
a^2*x^2+1)^(1/2))*arctan(a*x)+4*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))+6*poly
log(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)^2}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^3/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^(3/2)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}(a\,x)^2}{x^3\,\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^2/(x^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\mathrm{atan}^2(ax)}{x^3\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x**3/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**2/(x**3*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.346 $\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=397

$$-\frac{a^2\sqrt{a^2cx^2+c}}{3c^2x}+\frac{5a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{3c^2x}-\frac{a\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{3c^2x^2}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{3c^2x^3}-\frac{2a^4x}{c\sqrt{a^2cx^2+c}}+$$

```
[Out] -2*a^4*x/c/(a^2*c*x^2+c)^(1/2)+2*a^3*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)+a^4*
x*arctan(a*x)^2/c/(a^2*c*x^2+c)^(1/2)+22/3*a^3*arctan(a*x)*arctanh((1+I*a*x
)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-11/3*I*a^3
*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2
+c)^(1/2)+11/3*I*a^3*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)
^(1/2)/c/(a^2*c*x^2+c)^(1/2)-1/3*a^2*(a^2*c*x^2+c)^(1/2)/c^2/x-1/3*a*arctan
(a*x)*(a^2*c*x^2+c)^(1/2)/c^2/x^2-1/3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c^2
/x^3+5/3*a^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c^2/x
```

Rubi [A] time = 1.20, antiderivative size = 397, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4966, 4962, 264, 4958, 4954, 4944, 4898, 191}

$$-\frac{11ia^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3c\sqrt{a^2cx^2+c}}+\frac{11ia^3\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{3c\sqrt{a^2cx^2+c}}-\frac{a^2\sqrt{a^2cx^2+c}}{3c^2x}+\frac{5a^2\sqrt{a^2cx^2+}}{3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (-2*a^4*x)/(c*Sqrt[c + a^2*c*x^2]) - (a^2*Sqrt[c + a^2*c*x^2])/(3*c^2*x) +
(2*a^3*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2]) - (a*Sqrt[c + a^2*c*x^2]*ArcTan
[a*x])/(3*c^2*x^2) + (a^4*x*ArcTan[a*x]^2)/(c*Sqrt[c + a^2*c*x^2]) - (Sqrt[
c + a^2*c*x^2]*ArcTan[a*x]^2)/(3*c^2*x^3) + (5*a^2*Sqrt[c + a^2*c*x^2]*ArcT
an[a*x]^2)/(3*c^2*x) + (22*a^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[Sqrt[1
 + I*a*x]/Sqrt[1 - I*a*x]])/(3*c*Sqrt[c + a^2*c*x^2]) - (((11*I)/3)*a^3*Sqr
t[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/(c*Sqrt[c +
a^2*c*x^2]) + (((11*I)/3)*a^3*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/
Sqrt[1 - I*a*x]])/(c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^4\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^4\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3c^2x^3} + a^4\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx + \frac{(2a)\int \frac{\tan^{-1}(ax)}{x^3\sqrt{c+a^2cx^2}}\,dx}{3c} - \frac{\left(2a^2\right)\int}{}$$

$$= \frac{2a^3\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^2} + \frac{a^4x\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{3c^2x^3}$$

$$= -\frac{2a^4x}{c\sqrt{c+a^2cx^2}} - \frac{a^2\sqrt{c+a^2cx^2}}{3c^2x} + \frac{2a^3\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^2} + \frac{a^4x\tan}{c\sqrt{c+}}$$

$$= -\frac{2a^4x}{c\sqrt{c+a^2cx^2}} - \frac{a^2\sqrt{c+a^2cx^2}}{3c^2x} + \frac{2a^3\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{3c^2x^2} + \frac{a^4x\tan}{c\sqrt{c+}}$$

Mathematica [A] time = 3.60, size = 270, normalized size = 0.68

$$a^3\sqrt{a^2x^2+1}\left(\frac{\left(a^2x^2+1\right)^{3/2}\left(\tan^{-1}(ax)\left(\frac{66ax\left(\log\left(1+e^{i\tan^{-1}(ax)}\right)-\log\left(1-e^{i\tan^{-1}(ax)}\right)\right)}{\sqrt{a^2x^2+1}}+8\sin\left(2\tan^{-1}(ax)\right)-6\sin\left(4\tan^{-1}(ax)\right)+22\left(\log\left(1-e^{i\tan^{-1}(ax)}\right.\right.\right.\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^4*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (a^3*Sqrt[1 + a^2*x^2]*((-88*I)*PolyLog[2, -E^(I*ArcTan[a*x])] + ((1 + a^2*
x^2)^(3/2)*(-22 + 28*Cos[2*ArcTan[a*x]] - 6*Cos[4*ArcTan[a*x]] + ArcTan[a*x
]^2*(25 - 36*Cos[2*ArcTan[a*x]] + 3*Cos[4*ArcTan[a*x]]) + ((88*I)*a^3*x^3*P
olyLog[2, E^(I*ArcTan[a*x])])/(1 + a^2*x^2)^(3/2) + ArcTan[a*x]*((66*a*x*(-
Log[1 - E^(I*ArcTan[a*x])] + Log[1 + E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2]
 + 8*Sin[2*ArcTan[a*x]] + 22*(Log[1 - E^(I*ArcTan[a*x])] - Log[1 + E^(I*Arc
Tan[a*x])])*Sin[3*ArcTan[a*x]] - 6*Sin[4*ArcTan[a*x]])))/(a^3*x^3)))/(24*c*
Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{a^4c^2x^8+2\,a^2c^2x^6+c^2x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^4*c^2*x^8 + 2*a^2*c^2*x^6 + c
^2*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 2.44, size = 318, normalized size = 0.80

$$\frac{a^{3}\left(\arctan\left(ax\right)^{2}-2+2i\arctan\left(ax\right)\right)\left(ax-i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^{2}x^{2}+1\right)c^{2}}+\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(ax+i\right)\left(\arctan\left(ax\right)^{2}-2\right.}{2\left(a^{2}x^{2}+1\right)c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(3/2),x)

[Out] 1/2*a^3*(arctan(a*x)^2-2+2*I*arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))*a^3/(a^2*x^2+1)/c^2+1/3*(5*arctan(a*x)^2*x^2*a^2-a^2*x^2-arctan(a*x)*x*a-arctan(a*x)^2)*(c*(a*x-I)*(I+a*x))^(1/2)/x^3/c^2+11/3*I*a^3*(-I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{2}}{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x^4/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")

[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^(3/2)*x^4), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x^4\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^(3/2)),x)

[Out] int(atan(a*x)^2/(x^4*(c + a^2*c*x^2)^(3/2)), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{x^{4}\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(atan(a*x)**2/x**4/(a**2*c*x**2+c)**(3/2),x)

[Out] Integral(atan(a*x)**2/(x**4*(c*(a**2*x**2 + 1))**(3/2)), x)

3.347 $\int \frac{x^5 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=400

$$\frac{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}{a^6c^3}-\frac{2i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^6c^2\sqrt{a^2cx^2+c}}+\frac{2i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^6c^2\sqrt{a^2cx^2+c}}-\frac{32}{9a^6c^2\sqrt{a^2cx^2+c}}+\frac{5\tan^{-}}{3a^6c^2\sqrt{a}}$$

```
[Out] 2/27/a^6/c/(a^2*c*x^2+c)^(3/2)-2/9*x^3*arctan(a*x)/a^3/c/(a^2*c*x^2+c)^(3/2
)+1/3*x^2*arctan(a*x)^2/a^4/c/(a^2*c*x^2+c)^(3/2)-32/9/a^6/c^2/(a^2*c*x^2+c
)^(1/2)-10/3*x*arctan(a*x)/a^5/c^2/(a^2*c*x^2+c)^(1/2)+5/3*arctan(a*x)^2/a^
6/c^2/(a^2*c*x^2+c)^(1/2)+4*I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^
(1/2))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2+c)^(1/2)-2*I*polylog(2,-I*(1+I*
a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2+c)^(1/2)+2
*I*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^6/c^2/(
a^2*c*x^2+c)^(1/2)+arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^6/c^3
```

Rubi [A] time = 0.82, antiderivative size = 400, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4964, 4930, 4890, 4886, 4894, 4940, 266, 43}

$$-\frac{2i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^6c^2\sqrt{a^2cx^2+c}}+\frac{2i\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^6c^2\sqrt{a^2cx^2+c}}-\frac{32}{9a^6c^2\sqrt{a^2cx^2+c}}-\frac{10x\tan^{-1}(ax)}{3a^5c^2\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] 2/(27*a^6*c*(c + a^2*c*x^2)^(3/2)) - 32/(9*a^6*c^2*Sqrt[c + a^2*c*x^2]) - (
2*x^3*ArcTan[a*x])/(9*a^3*c*(c + a^2*c*x^2)^(3/2)) - (10*x*ArcTan[a*x])/(3*
a^5*c^2*Sqrt[c + a^2*c*x^2]) + (x^2*ArcTan[a*x]^2)/(3*a^4*c*(c + a^2*c*x^2)
^(3/2)) + (5*ArcTan[a*x]^2)/(3*a^6*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[c + a^2
*c*x^2]*ArcTan[a*x]^2)/(a^6*c^3) + ((4*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Arc
Tan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^6*c^2*Sqrt[c + a^2*c*x^2]) - ((2*I
)*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^
6*c^2*Sqrt[c + a^2*c*x^2]) + ((2*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1
+ I*a*x])/Sqrt[1 - I*a*x]])/(a^6*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
```

```
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^5 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\int \frac{x^3\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a^2} + \frac{\int \frac{x^3\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2c}$$

$$= -\frac{2x^3\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{x^2\tan^{-1}(ax)^2}{3a^4c\left(c+a^2cx^2\right)^{3/2}} + \frac{2\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{9a^2} + \frac{\int \frac{x\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{a^4c^2} - \frac{2\int}{}$$

$$= -\frac{2x^3\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{x^2\tan^{-1}(ax)^2}{3a^4c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^2}{3a^6c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax}{a^6c^3}$$

$$= -\frac{10}{3a^6c^2\sqrt{c+a^2cx^2}} - \frac{2x^3\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{10x\tan^{-1}(ax)}{3a^5c^2\sqrt{c+a^2cx^2}} + \frac{x^2\tan^{-1}(ax)^2}{3a^4c\left(c+a^2cx^2\right)^{3/2}} + \frac{}{3}$$

$$= \frac{2}{27a^6c\left(c+a^2cx^2\right)^{3/2}} - \frac{32}{9a^6c^2\sqrt{c+a^2cx^2}} - \frac{2x^3\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{10x\tan^{-1}(ax)}{3a^5c^2\sqrt{c+a^2cx^2}} + \frac{}{3}$$

Mathematica [A] time = 1.34, size = 229, normalized size = 0.57

$$\frac{-432i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) + 432i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right) - 9\left(a^2x^2+1\right)\tan^{-1}(ax)^2\left(-20\cos\left(2\tan^{-1}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^5*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (8*(-95 + Cos[2*ArcTan[a*x]]) - 9*(1 + a^2*x^2)*ArcTan[a*x]^2*(-45 - 20*Cos
[2*ArcTan[a*x]] + Cos[4*ArcTan[a*x]]) - (432*I)*Sqrt[1 + a^2*x^2]*PolyLog[2
, (-I)*E^(I*ArcTan[a*x])] + (432*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, I*E^(I*Arc
Tan[a*x])] + 6*ArcTan[a*x]*(-124*a*x - 72*Sqrt[1 + a^2*x^2]*Log[1 - I*E^(I*
ArcTan[a*x])] + 72*Sqrt[1 + a^2*x^2]*Log[1 + I*E^(I*ArcTan[a*x])] + (1 + a^
2*x^2)*Sin[4*ArcTan[a*x]]))/(216*a^6*c^2*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^5\arctan(ax)^2}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^5*arctan(a*x)^2/(a^6*c^3*x^6 + 3*a^4*c^3*x^4
 + 3*a^2*c^3*x^2 + c^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 5.71, size = 454, normalized size = 1.14

$$\frac{\left(6i\arctan\left(ax\right)+9\arctan\left(ax\right)^{2}-2\right)\left(ix^{3}a^{3}+3a^{2}x^{2}-3iax-1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^{2}x^{2}+1\right)^{2}c^{3}a^{6}}+\frac{7\left(\arctan\left(ax\right)^{2}-2+2i\arctan\right.}{8a^{6}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/216*(6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*(
c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3/a^6+7/8*(arctan(a*x)^2-2+2*I*arc
tan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/a^6/c^3/(a^2*x^2+1)-7/8*(c*(a
*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))/a^6/c^3/(
a^2*x^2+1)-1/216*(-6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(c*(a*x-I)*(I+a*x))^(
1/2)*(I*x^3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^6+arctan(a
*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^6-2*I*(I*arctan(a*x)*ln(1+I*(1+I*a*x)
/(a^2*x^2+1)^(1/2))-I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+dilog
(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(
a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^6/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{5}\arctan\left(ax\right)^{2}}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^5*arctan(a*x)^2/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^{5}\,\mathrm{atan}\left(a\,x\right)^{2}}{\left(c\,a^{2}\,x^{2}+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^5*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{5}\,\mathrm{atan}^{2}\left(ax\right)}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*atan(a*x)**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**5*atan(a*x)**2/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.348 $\int \frac{x^4 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=444

$$\frac{2x^3}{27a^2c\left(a^2cx^2+c\right)^{3/2}}-\frac{x^3\tan^{-1}(ax)^2}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2}{a^5c^2\sqrt{a^2cx^2+}}$$

```
[Out] 2/27*x^3/a^2/c/(a^2*c*x^2+c)^(3/2)-2/9*x^2*arctan(a*x)/a^3/c/(a^2*c*x^2+c)^
(3/2)-1/3*x^3*arctan(a*x)^2/a^2/c/(a^2*c*x^2+c)^(3/2)+22/9*x/a^4/c^2/(a^2*c
*x^2+c)^(1/2)-22/9*arctan(a*x)/a^5/c^2/(a^2*c*x^2+c)^(1/2)-x*arctan(a*x)^2/
a^4/c^2/(a^2*c*x^2+c)^(1/2)-2*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(
a*x)^2*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)+2*I*arctan(a*x)*polylo
g(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)
^(1/2)-2*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)
^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)-2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)+2*polylog(3,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.77, antiderivative size = 444, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4964, 4890, 4888, 4181, 2531, 2282, 6589, 4898, 191, 4944, 4938, 4930}

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}}{c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (2*x^3)/(27*a^2*c*(c + a^2*c*x^2)^(3/2)) + (22*x)/(9*a^4*c^2*Sqrt[c + a^2*c
*x^2]) - (2*x^2*ArcTan[a*x])/(9*a^3*c*(c + a^2*c*x^2)^(3/2)) - (22*ArcTan[a
*x])/(9*a^5*c^2*Sqrt[c + a^2*c*x^2]) - (x^3*ArcTan[a*x]^2)/(3*a^2*c*(c + a^
2*c*x^2)^(3/2)) - (x*ArcTan[a*x]^2)/(a^4*c^2*Sqrt[c + a^2*c*x^2]) - ((2*I)*
Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^5*c^2*Sqrt[c
+ a^2*c*x^2]) + ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*A
rcTan[a*x])])/(a^5*c^2*Sqrt[c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2*x^2]*ArcT
an[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^5*c^2*Sqrt[c + a^2*c*x^2]) - (2
*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a^5*c^2*Sqrt[c + a^
2*c*x^2]) + (2*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^5*c^2*
Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4938

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(q_), x_Symbol] :> Simp[(b*(f*x)^m*(d + e*x^2)^(q + 1))/(c*d*m^2), x] +
 (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x)^(m - 2)*(d + e*x^2)^(q + 1)*(a +
b*ArcTan[c*x]), x], x] - Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*A
rcTan[c*x]))/(c^2*d*m), x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d
] && EqQ[m + 2*q + 2, 0] && LtQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
```

```
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a^2} + \frac{\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2c}$$

$$= -\frac{x^3 \tan^{-1}(ax)^2}{3a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{2\int \frac{x^3 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{3a} + \frac{\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{a^4c^2} - \frac{\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^4c}$$

$$= \frac{2x^3}{27a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2x^2\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)}{a^5c^2\sqrt{c+a^2cx^2}} - \frac{x^3\tan^{-1}(ax)^2}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \cdots$$

$$= \frac{2x^3}{27a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x}{a^4c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{9a^5c^2\sqrt{c+a^2cx^2}} - \cdots$$

$$= \frac{2x^3}{27a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x}{9a^4c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{9a^5c^2\sqrt{c+a^2cx^2}} - \cdots$$

$$= \frac{2x^3}{27a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x}{9a^4c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{9a^5c^2\sqrt{c+a^2cx^2}} - \cdots$$

$$= \frac{2x^3}{27a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x}{9a^4c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{9a^5c^2\sqrt{c+a^2cx^2}} - \cdots$$

$$= \frac{2x^3}{27a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x}{9a^4c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{9a^5c^2\sqrt{c+a^2cx^2}} - \cdots$$

Mathematica [A] time = 0.59, size = 239, normalized size = 0.54

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{270\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} - \frac{135ax\left(\tan^{-1}(ax)^2-2\right)}{\sqrt{a^2x^2+1}} + 216i\tan^{-1}(ax)\left(\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right) - \mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)\right) - 216\left(\cdots\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*((-270*ArcTan[a*x])/Sqrt[1 + a^2*x^2] - (135*a*x*(-2
 + ArcTan[a*x]^2))/Sqrt[1 + a^2*x^2] + 6*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 1
08*ArcTan[a*x]^2*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x]
)]) + (216*I)*ArcTan[a*x]*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2,
I*E^(I*ArcTan[a*x])]) - 216*(PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - PolyLog[3
, I*E^(I*ArcTan[a*x])]) + (-2 + 9*ArcTan[a*x]^2)*Sin[3*ArcTan[a*x]]))/(108*
a^5*c^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^4\arctan\left(ax\right)^2}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^4*arctan(a*x)^2/(a^6*c^3*x^6 + 3*a^4*c^3*x^4
 + 3*a^2*c^3*x^2 + c^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 3.12, size = 0, normalized size = 0.00

$$\int \frac{x^4\arctan\left(ax\right)^2}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^4*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4\arctan\left(ax\right)^2}{\left(a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4*arctan(a*x)^2/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\mathrm{atan}\left(a\,x\right)^2}{{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^4*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4 \operatorname{atan}^2(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**4*atan(a*x)**2/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.349 $\int \frac{x^3 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=172

$$-\frac{x^2\tan^{-1}(ax)^2}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{2x^3\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}+\frac{14}{9a^4c^2\sqrt{a^2cx^2+c}}-\frac{2\tan^{-1}(ax)^2}{3a^4c^2\sqrt{a^2cx^2+c}}-\frac{2}{27a^4c\left(a^2cx^2+c\right)^{3/2}}+\frac{4x\tan^{-1}}{3a^3c^2\sqrt{a^2c}}$$

```
[Out] -2/27/a^4/c/(a^2*c*x^2+c)^(3/2)+2/9*x^3*arctan(a*x)/a/c/(a^2*c*x^2+c)^(3/2)
-1/3*x^2*arctan(a*x)^2/a^2/c/(a^2*c*x^2+c)^(3/2)+14/9/a^4/c^2/(a^2*c*x^2+c)
^(1/2)+4/3*x*arctan(a*x)/a^3/c^2/(a^2*c*x^2+c)^(1/2)-2/3*arctan(a*x)^2/a^4/
c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.28, antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4940, 4930, 4894, 266, 43}

$$\frac{14}{9a^4c^2\sqrt{a^2cx^2+c}}+\frac{4x\tan^{-1}(ax)}{3a^3c^2\sqrt{a^2cx^2+c}}-\frac{2\tan^{-1}(ax)^2}{3a^4c^2\sqrt{a^2cx^2+c}}-\frac{2}{27a^4c\left(a^2cx^2+c\right)^{3/2}}+\frac{2x^3\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}-\frac{x^2\tan^{-1}(a}{3a^2c\left(a^2cx^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -2/(27*a^4*c*(c + a^2*c*x^2)^(3/2)) + 14/(9*a^4*c^2*Sqrt[c + a^2*c*x^2]) +
(2*x^3*ArcTan[a*x])/(9*a*c*(c + a^2*c*x^2)^(3/2)) + (4*x*ArcTan[a*x])/(3*a^
3*c^2*Sqrt[c + a^2*c*x^2]) - (x^2*ArcTan[a*x]^2)/(3*a^2*c*(c + a^2*c*x^2)^(
3/2)) - (2*ArcTan[a*x]^2)/(3*a^4*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{2x^3\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^2}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2}{9}\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{2\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3a^2c}$$

$$= \frac{2x^3\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^2}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^2}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{1}{9}\text{Subst}\left(\int \frac{x}{\left(c+a^2cx\right)^{5/}}\right.$$

$$= \frac{4}{3a^4c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{4x\tan^{-1}(ax)}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^2}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2}{3a^4}$$

$$= -\frac{2}{27a^4c\left(c+a^2cx^2\right)^{3/2}} + \frac{14}{9a^4c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{4x\tan^{-1}(ax)}{3a^3c^2\sqrt{c+a^2cx^2}} - $$

Mathematica [A] time = 0.12, size = 81, normalized size = 0.47

$$\frac{\sqrt{a^2cx^2+c}\left(42a^2x^2+6ax\left(7a^2x^2+6\right)\tan^{-1}(ax)-9\left(3a^2x^2+2\right)\tan^{-1}(ax)^2+40\right)}{27a^4c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(40 + 42*a^2*x^2 + 6*a*x*(6 + 7*a^2*x^2)*ArcTan[a*x] -
 9*(2 + 3*a^2*x^2)*ArcTan[a*x]^2))/(27*a^4*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.74, size = 92, normalized size = 0.53

$$\frac{\sqrt{a^2cx^2+c}\left(42\,a^2x^2-9\left(3\,a^2x^2+2\right)\arctan\left(ax\right)^2+6\left(7\,a^3x^3+6\,ax\right)\arctan\left(ax\right)+40\right)}{27\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/27*sqrt(a^2*c*x^2 + c)*(42*a^2*x^2 - 9*(3*a^2*x^2 + 2)*arctan(a*x)^2 + 6*
(7*a^3*x^3 + 6*a*x)*arctan(a*x) + 40)/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^
3)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 2.94, size = 276, normalized size = 1.60

$$-\frac{\left(6i\arctan(ax)+9\arctan(ax)^2-2\right)\left(ix^3a^3+3a^2x^2-3iax-1\right)\sqrt{c(ax-i)(ax+i)}}{216\left(a^2x^2+1\right)^2c^3a^4}-\frac{3\left(\arctan(ax)^2-2+2i\,\mathrm{ar}\right.}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/216*(6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*
(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3/a^4-3/8*(arctan(a*x)^2-2+2*I*ar
ctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/a^4/c^3/(a^2*x^2+1)+3/8*(c*(
a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))/a^4/c^3/
(a^2*x^2+1)+1/216*(-6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(c*(a*x-I)*(I+a*x))^
(1/2)*(I*x^3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\arctan(ax)^2}{\left(a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^2/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\mathrm{atan}(a\,x)^2}{\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^3*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\,\mathrm{atan}^2(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**3*atan(a*x)**2/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.350 $\int \frac{x^2 \tan^{-1}(ax)^2}{(c+a^2cx^2)^{5/2}} dx$

Optimal. Leaf size=139

$$-\frac{4x}{9a^2c^2\sqrt{a^2cx^2+c}}+\frac{2x^2\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}-\frac{2x^3}{27c\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\tan^{-1}(ax)^2}{3c\left(a^2cx^2+c\right)^{3/2}}+\frac{4\tan^{-1}(ax)}{9a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -2/27*x^3/c/(a^2*c*x^2+c)^(3/2)+2/9*x^2*arctan(a*x)/a/c/(a^2*c*x^2+c)^(3/2)
+1/3*x^3*arctan(a*x)^2/c/(a^2*c*x^2+c)^(3/2)-4/9*x/a^2/c^2/(a^2*c*x^2+c)^(1
/2)+4/9*arctan(a*x)/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4944, 4938, 4930, 191}

$$-\frac{4x}{9a^2c^2\sqrt{a^2cx^2+c}}+\frac{4\tan^{-1}(ax)}{9a^3c^2\sqrt{a^2cx^2+c}}-\frac{2x^3}{27c\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\tan^{-1}(ax)^2}{3c\left(a^2cx^2+c\right)^{3/2}}+\frac{2x^2\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-2*x^3)/(27*c*(c + a^2*c*x^2)^(3/2)) - (4*x)/(9*a^2*c^2*Sqrt[c + a^2*c*x^2
]) + (2*x^2*ArcTan[a*x])/(9*a*c*(c + a^2*c*x^2)^(3/2)) + (4*ArcTan[a*x])/(9
*a^3*c^2*Sqrt[c + a^2*c*x^2]) + (x^3*ArcTan[a*x]^2)/(3*c*(c + a^2*c*x^2)^(3
/2))
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4938

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(q_), x_Symbol] :> Simp[(b*(f*x)^m*(d + e*x^2)^(q + 1))/(c*d*m^2), x] +
 (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x)^(m - 2)*(d + e*x^2)^(q + 1)*(a +
b*ArcTan[c*x]), x], x] - Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*A
rcTan[c*x]))/(c^2*d*m), x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d
] && EqQ[m + 2*q + 2, 0] && LtQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{1}{3}(2a)\int \frac{x^3\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

$$= -\frac{2x^3}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x^2\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x^3\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{4\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{9ac}$$

$$= -\frac{2x^3}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x^2\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{4\tan^{-1}(ax)}{9a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{4\int \frac{}{(c+}}{}$$

$$= -\frac{2x^3}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{4x}{9a^2c^2\sqrt{c+a^2cx^2}} + \frac{2x^2\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{4\tan^{-1}(ax)}{9a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3\,\mathrm{ta}}{3c\left(c\right.}$$

Mathematica [A] time = 0.09, size = 80, normalized size = 0.58

$$\frac{\sqrt{a^2cx^2+c}\left(9a^3x^3\tan^{-1}(ax)^2-2ax\left(7a^2x^2+6\right)+6\left(3a^2x^2+2\right)\tan^{-1}(ax)\right)}{27a^3c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-2*a*x*(6 + 7*a^2*x^2) + 6*(2 + 3*a^2*x^2)*ArcTan[a*x
] + 9*a^3*x^3*ArcTan[a*x]^2))/(27*a^3*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.48, size = 88, normalized size = 0.63

$$\frac{\left(9\,a^3x^3\arctan\left(ax\right)^2-14\,a^3x^3-12\,ax+6\left(3\,a^2x^2+2\right)\arctan\left(ax\right)\right)\sqrt{a^2cx^2+c}}{27\left(a^7c^3x^4+2\,a^5c^3x^2+a^3c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/27*(9*a^3*x^3*arctan(a*x)^2 - 14*a^3*x^3 - 12*a*x + 6*(3*a^2*x^2 + 2)*arc
tan(a*x))*sqrt(a^2*c*x^2 + c)/(a^7*c^3*x^4 + 2*a^5*c^3*x^2 + a^3*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 2.80, size = 272, normalized size = 1.96

$$\frac{\left(6i\arctan\left(ax\right)+9\arctan\left(ax\right)^2-2\right)\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^2x^2+1\right)^2c^3a^3}+\frac{\left(\arctan\left(ax\right)^2-2+2i\,\mathrm{arctar}\right.}{8a^3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/216*(6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(a^3*x^3-3*I*x^2*a^2-3*a*x+I)*(c*
(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3/a^3+1/8*(arctan(a*x)^2-2+2*I*arcta
n(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/a^3/c^3/(a^2*x^2+1)+1/8*(c*(a*x-I
)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))/a^3/c^3/(a^2*x^2
+1)+1/216*(-6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(c*(a*x-I)*(I+a*x))^(1/2)*(a
^3*x^3+3*I*x^2*a^2-3*a*x-I)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^3
```

maxima [A] time = 0.43, size = 117, normalized size = 0.84

$$\frac{1}{3}\left(\frac{x}{\sqrt{a^2cx^2+c}\,a^2c^2}-\frac{x}{\left(a^2cx^2+c\right)^{\frac{3}{2}}a^2c}\right)\arctan\left(ax\right)^2-\frac{2\left(7\,a^3x^3+6\,ax-3\left(3\,a^2x^2+2\right)\arctan\left(ax\right)\right)a}{27\left(a^6c^2x^2+a^4c^2\right)\sqrt{a^2x^2+1}\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*(x/(sqrt(a^2*c*x^2 + c)*a^2*c^2) - x/((a^2*c*x^2 + c)^(3/2)*a^2*c))*arc
tan(a*x)^2 - 2/27*(7*a^3*x^3 + 6*a*x - 3*(3*a^2*x^2 + 2)*arctan(a*x))*a/((a
^6*c^2*x^2 + a^4*c^2)*sqrt(a^2*x^2 + 1)*sqrt(c))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^2}{{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^2*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\,\mathrm{atan}^{2}\left(ax\right)}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**2/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.351 $\int \frac{x \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}} \, dx$

Optimal. Leaf size=137

$$\frac{4}{9a^2c^2\sqrt{a^2cx^2+c}}+\frac{4x\tan^{-1}(ax)}{9ac^2\sqrt{a^2cx^2+c}}+\frac{2}{27a^2c\left(a^2cx^2+c\right)^{3/2}}-\frac{\tan^{-1}(ax)^2}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{2x\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}$$

```
[Out] 2/27/a^2/c/(a^2*c*x^2+c)^(3/2)+2/9*x*arctan(a*x)/a/c/(a^2*c*x^2+c)^(3/2)-1/
3*arctan(a*x)^2/a^2/c/(a^2*c*x^2+c)^(3/2)+4/9/a^2/c^2/(a^2*c*x^2+c)^(1/2)+4
/9*x*arctan(a*x)/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4930, 4896, 4894}

$$\frac{4}{9a^2c^2\sqrt{a^2cx^2+c}}+\frac{4x\tan^{-1}(ax)}{9ac^2\sqrt{a^2cx^2+c}}+\frac{2}{27a^2c\left(a^2cx^2+c\right)^{3/2}}-\frac{\tan^{-1}(ax)^2}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{2x\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] 2/(27*a^2*c*(c + a^2*c*x^2)^(3/2)) + 4/(9*a^2*c^2*Sqrt[c + a^2*c*x^2]) + (2
*x*ArcTan[a*x])/(9*a*c*(c + a^2*c*x^2)^(3/2)) + (4*x*ArcTan[a*x])/(9*a*c^2*
Sqrt[c + a^2*c*x^2]) - ArcTan[a*x]^2/(3*a^2*c*(c + a^2*c*x^2)^(3/2))
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\tan^{-1}(ax)^2}{3a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{2\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{3a}$$

$$= \frac{2}{27a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} - \frac{\tan^{-1}(ax)^2}{3a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{4\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{9ac}$$

$$= \frac{2}{27a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{4}{9a^2c^2\sqrt{c+a^2cx^2}} + \frac{2x\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{4x\tan^{-1}(ax)}{9ac^2\sqrt{c+a^2cx^2}} - \frac{}{3a^2}$$

Mathematica [A] time = 0.09, size = 71, normalized size = 0.52

$$\frac{\sqrt{a^2cx^2+c}\left(2\left(6a^2x^2+7\right)+6ax\left(2a^2x^2+3\right)\tan^{-1}(ax)-9\tan^{-1}(ax)^2\right)}{27c^3\left(a^3x^2+a\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(2*(7 + 6*a^2*x^2) + 6*a*x*(3 + 2*a^2*x^2)*ArcTan[a*x]
 - 9*ArcTan[a*x]^2))/(27*c^3*(a + a^3*x^2)^2)
```

fricas [A] time = 0.71, size = 82, normalized size = 0.60

$$\frac{\sqrt{a^2cx^2+c}\left(12\,a^2x^2+6\left(2\,a^3x^3+3\,ax\right)\arctan\left(ax\right)-9\,\arctan\left(ax\right)^2+14\right)}{27\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/27*sqrt(a^2*c*x^2 + c)*(12*a^2*x^2 + 6*(2*a^3*x^3 + 3*a*x)*arctan(a*x) -
9*arctan(a*x)^2 + 14)/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.06, size = 276, normalized size = 2.01

$$\frac{\left(6i\arctan\left(ax\right)+9\arctan\left(ax\right)^2-2\right)\left(ix^3a^3+3a^2x^2-3iax-1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^2x^2+1\right)^2c^3a^2} - \frac{\left(\arctan\left(ax\right)^2-2+2i\,\mathrm{ar}\right.}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/216*(6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*(
c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3/a^2-1/8*(arctan(a*x)^2-2+2*I*arc
```

```
tan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/a^2/c^3/(a^2*x^2+1)+1/8*(c*(a
*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))/a^2/c^3/(
a^2*x^2+1)-1/216*(-6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(c*(a*x-I)*(I+a*x))^(
1/2)*(I*x^3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \arctan\left(ax\right)^2}{\left(a^2cx^2+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x*arctan(a*x)^2/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,{\mathrm{atan}\left(a\,x\right)}^2}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x*atan(a*x)^2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{atan}^{2}{\left(ax \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x*atan(a*x)**2/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.352 $\int \frac{\tan^{-1}(ax)^2}{(c+a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=157

$$-\frac{40x}{27c^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^2}{3c^2\sqrt{a^2cx^2+c}}+\frac{4\tan^{-1}(ax)}{3ac^2\sqrt{a^2cx^2+c}}-\frac{2x}{27c\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax)^2}{3c\left(a^2cx^2+c\right)^{3/2}}+\frac{2\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}$$

```
[Out] -2/27*x/c/(a^2*c*x^2+c)^(3/2)+2/9*arctan(a*x)/a/c/(a^2*c*x^2+c)^(3/2)+1/3*x
*arctan(a*x)^2/c/(a^2*c*x^2+c)^(3/2)-40/27*x/c^2/(a^2*c*x^2+c)^(1/2)+4/3*ar
ctan(a*x)/a/c^2/(a^2*c*x^2+c)^(1/2)+2/3*x*arctan(a*x)^2/c^2/(a^2*c*x^2+c)^(
1/2)
```

Rubi [A] time = 0.10, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4900, 4898, 191, 192}

$$-\frac{40x}{27c^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^2}{3c^2\sqrt{a^2cx^2+c}}+\frac{4\tan^{-1}(ax)}{3ac^2\sqrt{a^2cx^2+c}}-\frac{2x}{27c\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax)^2}{3c\left(a^2cx^2+c\right)^{3/2}}+\frac{2\tan^{-1}(ax)}{9ac\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-2*x)/(27*c*(c + a^2*c*x^2)^(3/2)) - (40*x)/(27*c^2*Sqrt[c + a^2*c*x^2]) +
 (2*ArcTan[a*x])/(9*a*c*(c + a^2*c*x^2)^(3/2)) + (4*ArcTan[a*x])/(3*a*c^2*S
qrt[c + a^2*c*x^2]) + (x*ArcTan[a*x]^2)/(3*c*(c + a^2*c*x^2)^(3/2)) + (2*x*
ArcTan[a*x]^2)/(3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{2\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{2}{9}\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{2\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3c}$$

$$= -\frac{2x}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{2\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{4\tan^{-1}(ax)}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan}{3c^2\sqrt{c}}$$

$$= -\frac{2x}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{40x}{27c^2\sqrt{c+a^2cx^2}} + \frac{2\tan^{-1}(ax)}{9ac\left(c+a^2cx^2\right)^{3/2}} + \frac{4\tan^{-1}(ax)}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan}{3c\left(c+\right.}$$

Mathematica [A] time = 0.08, size = 86, normalized size = 0.55

$$\frac{\sqrt{a^2cx^2+c}\left(-2ax\left(20a^2x^2+21\right)+9ax\left(2a^2x^2+3\right)\tan^{-1}(ax)^2+6\left(6a^2x^2+7\right)\tan^{-1}(ax)\right)}{27ac^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^2/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-2*a*x*(21 + 20*a^2*x^2) + 6*(7 + 6*a^2*x^2)*ArcTan[a
*x] + 9*a*x*(3 + 2*a^2*x^2)*ArcTan[a*x]^2))/(27*a*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.68, size = 93, normalized size = 0.59

$$-\frac{\left(40\,a^3x^3-9\left(2\,a^3x^3+3\,ax\right)\arctan\left(ax\right)^2+42\,ax-6\left(6\,a^2x^2+7\right)\arctan\left(ax\right)\right)\sqrt{a^2cx^2+c}}{27\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/27*(40*a^3*x^3 - 9*(2*a^3*x^3 + 3*a*x)*arctan(a*x)^2 + 42*a*x - 6*(6*a^2
*x^2 + 7)*arctan(a*x))*sqrt(a^2*c*x^2 + c)/(a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a
*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.57, size = 272, normalized size = 1.73

$$-\frac{\left(6i\arctan\left(ax\right)+9\arctan\left(ax\right)^2-2\right)\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^2x^2+1\right)^2ac^3}+\frac{3\left(\arctan\left(ax\right)^2-2+2i\,\mathrm{arc}\right.}{8c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/216*(6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(a^3*x^3-3*I*x^2*a^2-3*a*x+I)*(c
*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/a/c^3+3/8*(arctan(a*x)^2-2+2*I*arctan
(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a/(a^2*x^2+1)+3/8*(c*(a*x-I)*(
I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))/c^3/a/(a^2*x^2+1)-1
/216*(-6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(c*(a*x-I)*(I+a*x))^(1/2)*(a^3*x^
3+3*I*x^2*a^2-3*a*x-I)/(a^4*x^4+2*a^2*x^2+1)/a/c^3
```

maxima [A] time = 0.43, size = 111, normalized size = 0.71

$$\frac{1}{3}\left(\frac{2\,x}{\sqrt{a^2cx^2+c}\,c^2}+\frac{x}{\left(a^2cx^2+c\right)^{\frac{3}{2}}c}\right)\arctan\left(ax\right)^2-\frac{2\left(20\,a^3x^3+21\,ax-3\left(6\,a^2x^2+7\right)\arctan\left(ax\right)\right)a}{27\left(a^4c^2x^2+a^2c^2\right)\sqrt{a^2x^2+1}\,\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*(2*x/(sqrt(a^2*c*x^2 + c)*c^2) + x/((a^2*c*x^2 + c)^(3/2)*c))*arctan(a*
x)^2 - 2/27*(20*a^3*x^3 + 21*a*x - 3*(6*a^2*x^2 + 7)*arctan(a*x))*a/((a^4*c
^2*x^2 + a^2*c^2)*sqrt(a^2*x^2 + 1)*sqrt(c))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^2/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^2/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)**2/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.353 $\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=389

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\mathrm{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}+\cdots$$

```
[Out] -2/27/c/(a^2*c*x^2+c)^(3/2)-2/9*a*x*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)+1/3*a
rctan(a*x)^2/c/(a^2*c*x^2+c)^(3/2)-22/9/c^2/(a^2*c*x^2+c)^(1/2)-22/9*a*x*ar
ctan(a*x)/c^2/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^2/c^2/(a^2*c*x^2+c)^(1/2)-2*a
rctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^
2*c*x^2+c)^(1/2)+2*I*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a
^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-2*I*arctan(a*x)*polylog(2,(1+I*a*x)
/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-2*polylog(3,-
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+2*po
lylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1
/2)
```

Rubi [A] time = 0.78, antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4966, 4958, 4956, 4183, 2531, 2282, 6589, 4930, 4894, 4896}

$$\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{2i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\mathrm{Poly}\cdots}{c^2\sqrt{\cdots}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] -2/(27*c*(c + a^2*c*x^2)^(3/2)) - 22/(9*c^2*Sqrt[c + a^2*c*x^2]) - (2*a*x*A
rcTan[a*x])/(9*c*(c + a^2*c*x^2)^(3/2)) - (22*a*x*ArcTan[a*x])/(9*c^2*Sqrt[
c + a^2*c*x^2]) + ArcTan[a*x]^2/(3*c*(c + a^2*c*x^2)^(3/2)) + ArcTan[a*x]^2
/(c^2*Sqrt[c + a^2*c*x^2]) - (2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(
I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) + ((2*I)*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) - ((2*I)*S
qrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a
^2*c*x^2]) - (2*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/(c^2*Sqrt
[c + a^2*c*x^2]) + (2*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/(c^2
*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^{5/2}}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{1}{3}(2a)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx}{c^2} - \frac{a^2\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= -\frac{2}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{2ax\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{\tan^{-1}(ax)^2}{c^2\sqrt{c+a^2cx^2}} - \frac{(4a)\int \frac{\mathrm{ta}}{(c+}}{9}$$

$$= -\frac{2}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{22}{9c^2\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22ax\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(a}{3c\left(c+a^2\right.}$$

$$= -\frac{2}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{22}{9c^2\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22ax\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(a}{3c\left(c+a^2\right.}$$

$$= -\frac{2}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{22}{9c^2\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22ax\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(a}{3c\left(c+a^2\right.}$$

$$= -\frac{2}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{22}{9c^2\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22ax\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(a}{3c\left(c+a^2\right.}$$

$$= -\frac{2}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{22}{9c^2\sqrt{c+a^2cx^2}} - \frac{2ax\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22ax\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(a}{3c\left(c+a^2\right.}$$

Mathematica [A] time = 0.52, size = 246, normalized size = 0.63

$$\left(a^2x^2+1\right)^{3/2}\left(-\frac{270}{\sqrt{a^2x^2+1}} + \frac{135\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}} - \frac{270ax\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} + 216i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - 216i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] ((1 + a^2*x^2)^(3/2)*(-270/Sqrt[1 + a^2*x^2] - (270*a*x*ArcTan[a*x])/Sqrt[1
 + a^2*x^2] + (135*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] - 2*Cos[3*ArcTan[a*x]]
+ 9*ArcTan[a*x]^2*Cos[3*ArcTan[a*x]] + 108*ArcTan[a*x]^2*Log[1 - E^(I*ArcTa
n[a*x])] - 108*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + (216*I)*ArcTan[a*
x]*PolyLog[2, -E^(I*ArcTan[a*x])] - (216*I)*ArcTan[a*x]*PolyLog[2, E^(I*Arc
Tan[a*x])] - 216*PolyLog[3, -E^(I*ArcTan[a*x])] + 216*PolyLog[3, E^(I*ArcTa
n[a*x])] - 6*ArcTan[a*x]*Sin[3*ArcTan[a*x]]))/(108*c*(c*(1 + a^2*x^2))^(3/2
))
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^2}{a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x), x)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 0.90, size = 460, normalized size = 1.18

$$-\frac{\left(6i\arctan\left(ax\right)+9\arctan\left(ax\right)^{2}-2\right)\left(ix^{3}a^{3}+3a^{2}x^{2}-3iax-1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^{2}x^{2}+1\right)^{2}c^{3}}+\frac{5\left(\arctan\left(ax\right)^{2}-2+2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)^2/x/(a^2*c*x^2+c)^(5/2),x)

[Out] -1/216*(6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(I*x^3*a^3+3*a^2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3+5/8*(arctan(a*x)^2-2+2*I*arctan(a*x))*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/(a^2*x^2+1)-5/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))/c^3/(a^2*x^2+1)+1/216*(-6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(c*(a*x-I)*(I+a*x))^(1/2)*(I*x^3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3+(arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{2}}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")

[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^(5/2)*x), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^2}{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^(5/2)),x)

[Out] int(atan(a*x)^2/(x*(c + a^2*c*x^2)^(5/2)), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**2/x/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)**2/(x*(c*(a**2*x**2 + 1))**(5/2)), x)
```

3.354 $\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=381

$$-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{c^3x}+\frac{2ia\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{2ia\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}+\frac{94a^2x}{27c^2\sqrt{a^2cx^2+c}}-\frac{5a^2x\,\tan^{-1}(ax)^2}{3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 2/27*a^2*x/c/(a^2*c*x^2+c)^(3/2)-2/9*a*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)-1/
3*a^2*x*arctan(a*x)^2/c/(a^2*c*x^2+c)^(3/2)+94/27*a^2*x/c^2/(a^2*c*x^2+c)^(
1/2)-10/3*a*arctan(a*x)/c^2/(a^2*c*x^2+c)^(1/2)-5/3*a^2*x*arctan(a*x)^2/c^2
/(a^2*c*x^2+c)^(1/2)-4*a*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2
))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+2*I*a*polylog(2,-(1+I*a*x)^(1/
2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-2*I*a*polylog
(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/
2)-arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c^3/x
```

Rubi [A] time = 0.69, antiderivative size = 381, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4966, 4944, 4958, 4954, 4898, 191, 4900, 192}

$$\frac{2ia\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{2ia\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{c^2\sqrt{a^2cx^2+c}}+\frac{94a^2x}{27c^2\sqrt{a^2cx^2+c}}-\frac{5a^2x\tan^{-1}(ax)^2}{3c^2\sqrt{a^2cx^2+c}}-$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] (2*a^2*x)/(27*c*(c + a^2*c*x^2)^(3/2)) + (94*a^2*x)/(27*c^2*Sqrt[c + a^2*c*
x^2]) - (2*a*ArcTan[a*x])/(9*c*(c + a^2*c*x^2)^(3/2)) - (10*a*ArcTan[a*x])/
(3*c^2*Sqrt[c + a^2*c*x^2]) - (a^2*x*ArcTan[a*x]^2)/(3*c*(c + a^2*c*x^2)^(3
/2)) - (5*a^2*x*ArcTan[a*x]^2)/(3*c^2*Sqrt[c + a^2*c*x^2]) - (Sqrt[c + a^2*
c*x^2]*ArcTan[a*x]^2)/(c^3*x) - (4*a*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTanh[
Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(c^2*Sqrt[c + a^2*c*x^2]) + ((2*I)*a*Sqrt
[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/(c^2*Sqrt[c +
 a^2*c*x^2]) - ((2*I)*a*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1
 - I*a*x]])/(c^2*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^2}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= -\frac{2a\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{a^2x\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{1}{9}\left(2a^2\right)\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}}{c^2}$$

$$= \frac{2a^2x}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{2a\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{10a\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a^2x\,\mathrm{t}}{3c^2\sqrt{c}}$$

$$= \frac{2a^2x}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x}{27c^2\sqrt{c+a^2cx^2}} - \frac{2a\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{10a\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\,\mathrm{ta}}{3c\left(c+\right.}$$

$$= \frac{2a^2x}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x}{27c^2\sqrt{c+a^2cx^2}} - \frac{2a\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{10a\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\,\mathrm{ta}}{3c\left(c+\right.}$$

Mathematica [A] time = 1.70, size = 296, normalized size = 0.78

$$-\frac{a\left(-216i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)+216i\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+54\sqrt{a^2x^2+1}\,\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)\tan^{-1}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^2/(x^2*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] -1/108*(a*(-378*a*x + 378*ArcTan[a*x] + 189*a*x*ArcTan[a*x]^2 + 6*Sqrt[1 +
a^2*x^2]*ArcTan[a*x]*Cos[3*ArcTan[a*x]] + 27*a*x*ArcTan[a*x]^2*Csc[ArcTan[a
*x]/2]^2 - 216*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] + 2
16*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] - (216*I)*Sqrt[
1 + a^2*x^2]*PolyLog[2, -E^(I*ArcTan[a*x])] + (216*I)*Sqrt[1 + a^2*x^2]*Pol
yLog[2, E^(I*ArcTan[a*x])] - 2*Sqrt[1 + a^2*x^2]*Sin[3*ArcTan[a*x]] + 9*Sqr
t[1 + a^2*x^2]*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]] + 54*Sqrt[1 + a^2*x^2]*ArcT
an[a*x]^2*Tan[ArcTan[a*x]/2]))/(c^2*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^2}{a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2/(a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3
*a^2*c^3*x^4 + c^3*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 0.80, size = 433, normalized size = 1.14

$$\frac{a\left(6i\arctan\left(ax\right)+9\arctan\left(ax\right)^{2}-2\right)\left(a^{3}x^{3}-3ix^{2}a^{2}-3ax+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^{2}x^{2}+1\right)^{2}c^{3}}-\frac{7a\left(\arctan\left(ax\right)^{2}-2+2i\,\mathrm{ar}\right.}{8c}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(5/2),x)

[Out] 1/216*a*(6*I*arctan(a*x)+9*arctan(a*x)^2-2)*(a^3*x^3-3*I*x^2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3-7/8*a*(arctan(a*x)^2-2+2*I*arctan(a*x))*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/(a^2*x^2+1)-7/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^2-2-2*I*arctan(a*x))*a/c^3/(a^2*x^2+1)+1/216*(c*(a*x-I)*(I+a*x))^(1/2)*(a^3*x^3+3*I*x^2*a^2-3*a*x-I)*(-6*I*arctan(a*x)+9*arctan(a*x)^2-2)*a/c^3/(a^4*x^4+2*a^2*x^2+1)-arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/x/c^3-2*I*a*(-I*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{2}}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^2/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")

[Out] integrate(arctan(a*x)^2/((a^2*c*x^2 + c)^(5/2)*x^2), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{2}}{x^{2}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^(5/2)),x)

[Out] int(atan(a*x)^2/(x^2*(c + a^2*c*x^2)^(5/2)), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{2}{\left(ax \right)}}{x^{2}\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(atan(a*x)**2/x**2/(a**2*c*x**2+c)**(5/2),x)

[Out] Integral(atan(a*x)**2/(x**2*(c*(a**2*x**2 + 1))**(5/2)), x)

3.355 $\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^2 \tan^{-1}(ax)^2,x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^2, x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^2 \, dx=\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^2 \, dx$$

Mathematica [A] time = 1.89, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^2,x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^2, x]
```

fricas [A] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4 c^2 x^4+2\,a^2 c^2 x^2+c^2\right) x^m \arctan\left(ax\right)^2,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m*arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.59, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\,x^2+c\right)^2 \arctan\left(ax\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^2,x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$7\left(\left(a^4c^2m^2+4\,a^4c^2m+3\,a^4c^2\right)x^5+2\left(a^2c^2m^2+6\,a^2c^2m+5\,a^2c^2\right)x^3+\left(c^2m^2+8\,c^2m+15\,c^2\right)x\right)x^m\arctan(ax)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/16*(4*((a^4*c^2*m^2 + 4*a^4*c^2*m + 3*a^4*c^2)*x^5 + 2*(a^2*c^2*m^2 + 6*a
^2*c^2*m + 5*a^2*c^2)*x^3 + (c^2*m^2 + 8*c^2*m + 15*c^2)*x)*x^m*arctan(a*x)
^2 - ((a^4*c^2*m^2 + 4*a^4*c^2*m + 3*a^4*c^2)*x^5 + 2*(a^2*c^2*m^2 + 6*a^2*
c^2*m + 5*a^2*c^2)*x^3 + (c^2*m^2 + 8*c^2*m + 15*c^2)*x)*x^m*log(a^2*x^2 +
1)^2 + 16*(m^3 + 9*m^2 + 23*m + 15)*integrate(1/16*(12*((a^6*c^2*m^3 + 9*a^
6*c^2*m^2 + 23*a^6*c^2*m + 15*a^6*c^2)*x^6 + c^2*m^3 + 3*(a^4*c^2*m^3 + 9*a
^4*c^2*m^2 + 23*a^4*c^2*m + 15*a^4*c^2)*x^4 + 9*c^2*m^2 + 23*c^2*m + 3*(a^2
*c^2*m^3 + 9*a^2*c^2*m^2 + 23*a^2*c^2*m + 15*a^2*c^2)*x^2 + 15*c^2)*x^m*arc
tan(a*x)^2 + ((a^6*c^2*m^3 + 9*a^6*c^2*m^2 + 23*a^6*c^2*m + 15*a^6*c^2)*x^6
 + c^2*m^3 + 3*(a^4*c^2*m^3 + 9*a^4*c^2*m^2 + 23*a^4*c^2*m + 15*a^4*c^2)*x^
4 + 9*c^2*m^2 + 23*c^2*m + 3*(a^2*c^2*m^3 + 9*a^2*c^2*m^2 + 23*a^2*c^2*m +
15*a^2*c^2)*x^2 + 15*c^2)*x^m*log(a^2*x^2 + 1)^2 - 8*((a^5*c^2*m^2 + 4*a^5*
c^2*m + 3*a^5*c^2)*x^5 + 2*(a^3*c^2*m^2 + 6*a^3*c^2*m + 5*a^3*c^2)*x^3 + (a
*c^2*m^2 + 8*a*c^2*m + 15*a*c^2)*x)*x^m*arctan(a*x) + 4*((a^6*c^2*m^2 + 4*a
^6*c^2*m + 3*a^6*c^2)*x^6 + 2*(a^4*c^2*m^2 + 6*a^4*c^2*m + 5*a^4*c^2)*x^4 +
 (a^2*c^2*m^2 + 8*a^2*c^2*m + 15*a^2*c^2)*x^2)*x^m*log(a^2*x^2 + 1))/(m^3 +
 (a^2*m^3 + 9*a^2*m^2 + 23*a^2*m + 15*a^2)*x^2 + 9*m^2 + 23*m + 15), x))/(m
^3 + 9*m^2 + 23*m + 15)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^2*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^m*atan(a*x)^2*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x^m\operatorname{atan}^2(ax)\,dx+\int 2a^2x^2x^m\operatorname{atan}^2(ax)\,dx+\int a^4x^4x^m\operatorname{atan}^2(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2*atan(a*x)**2,x)
```

```
[Out] c**2*(Integral(x**m*atan(a*x)**2, x) + Integral(2*a**2*x**2*x**m*atan(a*x)*
*2, x) + Integral(a**4*x**4*x**m*atan(a*x)**2, x))
```

3.356 $\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=23

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right) \tan^{-1}(ax)^2, x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)*arctan(a*x)^2,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] Defer[Int][x^m*(c + a^2*c*x^2)*ArcTan[a*x]^2, x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(ax)^2 \, dx = \int x^m \left(c+a^2 c x^2\right) \tan^{-1}(ax)^2 \, dx$$

Mathematica [A] time = 0.96, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^2,x]
```

```
[Out] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^2, x]
```

fricas [A] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right) x^m \arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*x^m*arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.54, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\, x^2+c\right) \arctan\left(ax\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^2,x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{7\left(\left(a^2cm+a^2c\right)x^3+(cm+3\,c)x\right)x^m\arctan(ax)^2-\frac{3}{4}\left(\left(a^2cm+a^2c\right)x^3+(cm+3\,c)x\right)x^m\log\left(a^2x^2+1\right)^2+\left(m^2+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] 1/16*(4*((a^2*c*m + a^2*c)*x^3 + (c*m + 3*c)*x)*x^m*arctan(a*x)^2 - ((a^2*c
*m + a^2*c)*x^3 + (c*m + 3*c)*x)*x^m*log(a^2*x^2 + 1)^2 + 16*(m^2 + 4*m + 3
)*integrate(1/16*(12*((a^4*c*m^2 + 4*a^4*c*m + 3*a^4*c)*x^4 + c*m^2 + 2*(a^
2*c*m^2 + 4*a^2*c*m + 3*a^2*c)*x^2 + 4*c*m + 3*c)*x^m*arctan(a*x)^2 + ((a^4
*c*m^2 + 4*a^4*c*m + 3*a^4*c)*x^4 + c*m^2 + 2*(a^2*c*m^2 + 4*a^2*c*m + 3*a^
2*c)*x^2 + 4*c*m + 3*c)*x^m*log(a^2*x^2 + 1)^2 - 8*((a^3*c*m + a^3*c)*x^3 +
 (a*c*m + 3*a*c)*x)*x^m*arctan(a*x) + 4*((a^4*c*m + a^4*c)*x^4 + (a^2*c*m +
 3*a^2*c)*x^2)*x^m*log(a^2*x^2 + 1))/((a^2*m^2 + 4*a^2*m + 3*a^2)*x^2 + m^2
 + 4*m + 3), x))/(m^2 + 4*m + 3)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^2*(c + a^2*c*x^2),x)
```

```
[Out] int(x^m*atan(a*x)^2*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^m\,\mathrm{atan}^2\left(ax\right)dx+\int a^2x^2x^m\,\mathrm{atan}^2\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)*atan(a*x)**2,x)
```

```
[Out] c*(Integral(x**m*atan(a*x)**2, x) + Integral(a**2*x**2*x**m*atan(a*x)**2, x
))
```

3.357 $\int \frac{x^m \tan^{-1}(ax)^2}{c+a^2cx^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^2}{a^2cx^2+c},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^2/(a^2*c*x^2+c),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^2}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^2}{c+a^2cx^2}\,dx = \int \frac{x^m \tan^{-1}(ax)^2}{c+a^2cx^2}\,dx$$

Mathematica [A] time = 0.91, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^2}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2),x]
[Out] Integrate[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2), x]
```

fricas [A] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^2}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^2}{a^2c\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c),x)
```

```
[Out] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^2}{a^2cx^2 + c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2 + c), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\,x)^2}{c\,a^2\,x^2 + c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2),x)
```

```
[Out] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m \operatorname{atan}^2(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**m*atan(a*x)**2/(a**2*x**2 + 1), x)/c
```

3.358 $\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^2}{\left(a^2cx^2+c\right)^2}, x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] Defer[Int][(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2, x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2} dx = \int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2} dx$$

Mathematica [A] time = 0.70, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] Integrate[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^2, x]
```

fricas [A] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan\left(ax\right)^2}{a^4c^2x^4+2\,a^2c^2x^2+c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(x^m*arctan(a*x)^2/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^2}{\left(a^2c\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^2,x)
[Out] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^2}{\left(a^2cx^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2 + c)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\,x)^2}{\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2)^2,x)
[Out] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m \operatorname{atan}^2(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**2/(a**2*c*x**2+c)**2,x)
[Out] Integral(x**m*atan(a*x)**2/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.359 $\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2cx^2+c\right)^{3/2} \tan^{-1}(ax)^2, x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2, x]
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx = \int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx$$

Mathematica [A] time = 1.04, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2,x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2, x]
```

fricas [A] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^2+c\right)^{\frac{3}{2}} x^m \arctan\left(ax\right)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.11, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x)
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^{2} c x^{2} + c\right)^{\frac{3}{2}} x^{m} \arctan \left(a x\right)^{2}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m\,{\mathrm{atan}\left(a\,x\right)}^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^2*(c + a^2*c*x^2)^(3/2),x)
[Out] int(x^m*atan(a*x)^2*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)*atan(a*x)**2,x)
[Out] Timed out
```

3.360 $\int x^m \sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \sqrt{a^2cx^2+c} \tan^{-1}(ax)^2, x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^2,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
[Out] Defer[Int][x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2, x]
```

Rubi steps

$$\int x^m \sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 \, dx = \int x^m \sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 \, dx$$

Mathematica [A] time = 0.16, size = 0, normalized size = 0.00

$$\int x^m \sqrt{c+a^2cx^2} \tan^{-1}(ax)^2 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2,x]
[Out] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2, x]
```

fricas [A] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\, x^m \arctan(ax)^2, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.05, size = 0, normalized size = 0.00

$$\int x^m \sqrt{a^2c\,x^2+c}\; \arctan(ax)^2\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^2,x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^2cx^2 + c}\, x^m \arctan(ax)^2 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}(a\,x)^2 \sqrt{c\,a^2\,x^2 + c} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^2*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^m*atan(a*x)^2*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m \sqrt{c\left(a^2x^2 + 1\right)} \operatorname{atan}^2(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)*atan(a*x)**2,x)
```

```
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2, x)
```

3.361 $\int \frac{x^m \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^2}{\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} \, dx = \int \frac{x^m \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} \, dx$$

Mathematica [A] time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2],x]
[Out] Integrate[(x^m*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2], x]
```

fricas [A] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^2}{\sqrt{a^2cx^2+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.44, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^2}{\sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^2}{\sqrt{a^2 c x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)^2/sqrt(a^2*c*x^2 + c), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\, x)^2}{\sqrt{c\, a^2\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2),x)
[Out] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \operatorname{atan}^2(ax)}{\sqrt{c\left(a^2 x^2 + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m*atan(a*x)**2/sqrt(c*(a**2*x**2 + 1)), x)
```

3.362 $\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^2}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 0.71, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2),x]
[Out] Integrate[(x^m*ArcTan[a*x]^2)/(c + a^2*c*x^2)^(3/2), x]
```

fricas [A] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m \arctan(ax)^2}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^2/(a^4*c^2*x^4 + 2*a^2*c^2*x^2
 + c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.67, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan\left(a x\right)^{2}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
[Out] int(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan\left(a x\right)^{2}}{\left(a^{2} c x^{2} + c\right)^{\frac{3}{2}}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)^2/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^2}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2),x)
[Out] int((x^m*atan(a*x)^2)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \operatorname{atan}^{2}{\left(a x \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**2/(a**2*c*x**2+c)**(3/2),x)
[Out] Integral(x**m*atan(a*x)**2/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.363 $\int x^3 \left(c + a^2cx^2\right) \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=219

$$\frac{7ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{30a^4}-\frac{c\tan^{-1}(ax)^3}{12a^4}+\frac{7ic\tan^{-1}(ax)^2}{30a^4}-\frac{c\tan^{-1}(ax)}{15a^4}+\frac{7c\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{15a^4}+\frac{cx}{15a^3}+\frac{cx\tan^{-1}(ax)^2}{4a^3}$$

```
[Out] 1/15*c*x/a^3-1/60*c*x^3/a-1/15*c*arctan(a*x)/a^4-1/60*c*x^2*arctan(a*x)/a^2
+1/20*c*x^4*arctan(a*x)+7/30*I*c*arctan(a*x)^2/a^4+1/4*c*x*arctan(a*x)^2/a^
3-1/12*c*x^3*arctan(a*x)^2/a-1/10*a*c*x^5*arctan(a*x)^2-1/12*c*arctan(a*x)^
3/a^4+1/4*c*x^4*arctan(a*x)^3+1/6*a^2*c*x^6*arctan(a*x)^3+7/15*c*arctan(a*x
)*ln(2/(1+I*a*x))/a^4+7/30*I*c*polylog(2,1-2/(1+I*a*x))/a^4
```

Rubi [A] time = 1.11, antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 52, number of rules used = 12, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4950, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 4846, 4884, 302}

$$\frac{7ic\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{30a^4}+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^3-\frac{cx^2\tan^{-1}(ax)}{60a^2}+\frac{cx}{15a^3}+\frac{cx\tan^{-1}(ax)^2}{4a^3}-\frac{c\tan^{-1}(ax)^3}{12a^4}+\frac{7ic\tan^{-1}(}{30a^4}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*x)/(15*a^3) - (c*x^3)/(60*a) - (c*ArcTan[a*x])/(15*a^4) - (c*x^2*ArcTan[
a*x])/(60*a^2) + (c*x^4*ArcTan[a*x])/20 + (((7*I)/30)*c*ArcTan[a*x]^2)/a^4
+ (c*x*ArcTan[a*x]^2)/(4*a^3) - (c*x^3*ArcTan[a*x]^2)/(12*a) - (a*c*x^5*Arc
Tan[a*x]^2)/10 - (c*ArcTan[a*x]^3)/(12*a^4) + (c*x^4*ArcTan[a*x]^3)/4 + (a^
2*c*x^6*ArcTan[a*x]^3)/6 + (7*c*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(15*a^4) +
(((7*I)/30)*c*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^4
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rubi steps

$$\int x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^3\,dx = c\int x^3\tan^{-1}(ax)^3\,dx+\left(a^2c\right)\int x^5\tan^{-1}(ax)^3\,dx$$
$$=\frac{1}{4}cx^4\tan^{-1}(ax)^3+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^3-\frac{1}{4}(3ac)\int\frac{x^4\tan^{-1}(ax)^2}{1+a^2x^2}\,dx-\frac{1}{2}\left(a^3c\right.$$
$$=\frac{1}{4}cx^4\tan^{-1}(ax)^3+\frac{1}{6}a^2cx^6\tan^{-1}(ax)^3-\frac{(3c)\int x^2\tan^{-1}(ax)^2\,dx}{4a}+\frac{(3c)\int\frac{x^2 t}{1}}{4}$$
$$=-\frac{cx^3\tan^{-1}(ax)^2}{4a}-\frac{1}{10}acx^5\tan^{-1}(ax)^2+\frac{1}{4}cx^4\tan^{-1}(ax)^3+\frac{1}{6}a^2cx^6\tan^{-1}(ax$$
$$=\frac{3cx\tan^{-1}(ax)^2}{4a^3}-\frac{cx^3\tan^{-1}(ax)^2}{12a}-\frac{1}{10}acx^5\tan^{-1}(ax)^2-\frac{c\tan^{-1}(ax)^3}{4a^4}+\frac{1}{4}cx$$
$$=\frac{cx^2\tan^{-1}(ax)}{4a^2}+\frac{1}{20}cx^4\tan^{-1}(ax)+\frac{ic\tan^{-1}(ax)^2}{a^4}+\frac{cx\tan^{-1}(ax)^2}{4a^3}-\frac{cx^3\tan}{12}$$
$$=-\frac{cx}{4a^3}-\frac{cx^2\tan^{-1}(ax)}{60a^2}+\frac{1}{20}cx^4\tan^{-1}(ax)+\frac{7ic\tan^{-1}(ax)^2}{30a^4}+\frac{cx\tan^{-1}(ax)^2}{4a^3}$$
$$=\frac{cx}{15a^3}-\frac{cx^3}{60a}+\frac{c\tan^{-1}(ax)}{4a^4}-\frac{cx^2\tan^{-1}(ax)}{60a^2}+\frac{1}{20}cx^4\tan^{-1}(ax)+\frac{7ic\tan^{-1}(a}{30a^4}$$
$$=\frac{cx}{15a^3}-\frac{cx^3}{60a}-\frac{c\tan^{-1}(ax)}{15a^4}-\frac{cx^2\tan^{-1}(ax)}{60a^2}+\frac{1}{20}cx^4\tan^{-1}(ax)+\frac{7ic\tan^{-1}(a}{30a^4}$$
$$=\frac{cx}{15a^3}-\frac{cx^3}{60a}-\frac{c\tan^{-1}(ax)}{15a^4}-\frac{cx^2\tan^{-1}(ax)}{60a^2}+\frac{1}{20}cx^4\tan^{-1}(ax)+\frac{7ic\tan^{-1}(a}{30a^4}$$

Mathematica [A] time = 0.67, size = 135, normalized size = 0.62

$$\frac{c\left(-a^3x^3+5\left(2a^6x^6+3a^4x^4-1\right)\tan^{-1}(ax)^3-\left(6a^5x^5+5a^3x^3-15ax+14i\right)\tan^{-1}(ax)^2+\tan^{-1}(ax)\left(3a^4x^4-\right.\right.}{60a^4}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*(4*a*x - a^3*x^3 - (14*I - 15*a*x + 5*a^3*x^3 + 6*a^5*x^5)*ArcTan[a*x]^2
 + 5*(-1 + 3*a^4*x^4 + 2*a^6*x^6)*ArcTan[a*x]^3 + ArcTan[a*x]*(-4 - a^2*x^2
 + 3*a^4*x^4 + 28*Log[1 + E^((2*I)*ArcTan[a*x])]) - (14*I)*PolyLog[2, -E^((
2*I)*ArcTan[a*x])]))/(60*a^4)
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^5+cx^3\right)\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^5 + c*x^3)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 0.15, size = 313, normalized size = 1.43

$$\frac{a^2 c\, x^6 \arctan(ax)^3}{6}+\frac{c\, x^4 \arctan(ax)^3}{4}-\frac{ac\, x^5 \arctan(ax)^2}{10}-\frac{c\, x^3 \arctan(ax)^2}{12a}+\frac{cx \arctan(ax)^2}{4a^3}-\frac{c \arctan(ax)^3}{12a^4}+c$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*(a^2*c*x^2+c)*arctan(a*x)^3,x)

[Out] 1/6*a^2*c*x^6*arctan(a*x)^3+1/4*c*x^4*arctan(a*x)^3-1/10*a*c*x^5*arctan(a*x)^2-1/12*c*x^3*arctan(a*x)^2/a+1/4*c*x*arctan(a*x)^2/a^3-1/12*c*arctan(a*x)^3/a^4+1/20*c*x^4*arctan(a*x)-1/60*c*x^2*arctan(a*x)/a^2-7/30/a^4*c*arctan(a*x)*ln(a^2*x^2+1)-1/60*c*x^3/a+1/15*c*x/a^3-1/15*c*arctan(a*x)/a^4-7/60*I/a^4*c*ln(I+a*x)*ln(1/2*I*(a*x-I))-7/60*I/a^4*c*dilog(1/2*I*(a*x-I))+7/120*I/a^4*c*ln(a*x-I)^2+7/60*I/a^4*c*ln(I+a*x)*ln(a^2*x^2+1)-7/120*I/a^4*c*ln(I+a*x)^2+7/60*I/a^4*c*ln(a*x-I)*ln(-1/2*I*(I+a*x))-7/60*I/a^4*c*ln(a*x-I)*ln(a^2*x^2+1)+7/60*I/a^4*c*dilog(-1/2*I*(I+a*x))

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="maxima")

[Out] Timed out

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 \operatorname{atan}(a\,x)^3\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3*atan(a*x)^3*(c + a^2*c*x^2),x)

[Out] int(x^3*atan(a*x)^3*(c + a^2*c*x^2), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^3 \operatorname{atan}^3(ax)\,dx+\int a^2x^5 \operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**3*(a**2*c*x**2+c)*atan(a*x)**3,x)

[Out] c*(Integral(x**3*atan(a*x)**3, x) + Integral(a**2*x**5*atan(a*x)**3, x))

3.364 $\int x^2 \left(c + a^2cx^2\right) \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=211

$$-\frac{c\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{5a^3}-\frac{2ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{5a^3}-\frac{2ic\tan^{-1}(ax)^3}{15a^3}-\frac{c\tan^{-1}(ax)^2}{20a^3}-\frac{2c\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^2}{5a^3}+\frac{1}{5}a^2$$

```
[Out] -1/20*c*x^2/a+1/10*c*x*arctan(a*x)/a^2+1/10*c*x^3*arctan(a*x)-1/20*c*arctan
(a*x)^2/a^3-1/5*c*x^2*arctan(a*x)^2/a-3/20*a*c*x^4*arctan(a*x)^2-2/15*I*c*a
rctan(a*x)^3/a^3+1/3*c*x^3*arctan(a*x)^3+1/5*a^2*c*x^5*arctan(a*x)^3-2/5*c*
arctan(a*x)^2*ln(2/(1+I*a*x))/a^3-2/5*I*c*arctan(a*x)*polylog(2,1-2/(1+I*a*
x))/a^3-1/5*c*polylog(3,1-2/(1+I*a*x))/a^3
```

Rubi [A] time = 0.88, antiderivative size = 211, normalized size of antiderivative = 1.00, number of steps used = 34, number of rules used = 12, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4950, 4852, 4916, 4846, 260, 4884, 4920, 4854, 4994, 6610, 266, 43}

$$-\frac{c\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{5a^3}-\frac{2ic\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{5a^3}+\frac{1}{5}a^2cx^5\tan^{-1}(ax)^3+\frac{cx\tan^{-1}(ax)}{10a^2}-\frac{2ic\tan^{-1}(}{15a^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] -(c*x^2)/(20*a) + (c*x*ArcTan[a*x])/(10*a^2) + (c*x^3*ArcTan[a*x])/10 - (c*
ArcTan[a*x]^2)/(20*a^3) - (c*x^2*ArcTan[a*x]^2)/(5*a) - (3*a*c*x^4*ArcTan[a
*x]^2)/20 - (((2*I)/15)*c*ArcTan[a*x]^3)/a^3 + (c*x^3*ArcTan[a*x]^3)/3 + (a
^2*c*x^5*ArcTan[a*x]^3)/5 - (2*c*ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/(5*a^3)
- (((2*I)/5)*c*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^3 - (c*PolyLog[
3, 1 - 2/(1 + I*a*x)])/(5*a^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
```

```
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^3\,dx = c\int x^2\tan^{-1}(ax)^3\,dx+\left(a^2c\right)\int x^4\tan^{-1}(ax)^3\,dx$$
$$=\frac{1}{3}cx^3\tan^{-1}(ax)^3+\frac{1}{5}a^2cx^5\tan^{-1}(ax)^3-(ac)\int\frac{x^3\tan^{-1}(ax)^2}{1+a^2x^2}\,dx-\frac{1}{5}\left(3a^3c\right)$$
$$=\frac{1}{3}cx^3\tan^{-1}(ax)^3+\frac{1}{5}a^2cx^5\tan^{-1}(ax)^3-\frac{c\int x\tan^{-1}(ax)^2\,dx}{a}+\frac{c\int\frac{x\tan^{-1}(ax)^2}{1+a^2x^2}}{a}$$
$$=-\frac{cx^2\tan^{-1}(ax)^2}{2a}-\frac{3}{20}acx^4\tan^{-1}(ax)^2-\frac{ic\tan^{-1}(ax)^3}{3a^3}+\frac{1}{3}cx^3\tan^{-1}(ax)^3+$$
$$=-\frac{cx^2\tan^{-1}(ax)^2}{5a}-\frac{3}{20}acx^4\tan^{-1}(ax)^2-\frac{2ic\tan^{-1}(ax)^3}{15a^3}+\frac{1}{3}cx^3\tan^{-1}(ax)^3+$$
$$=\frac{cx\tan^{-1}(ax)}{a^2}+\frac{1}{10}cx^3\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)^2}{2a^3}-\frac{cx^2\tan^{-1}(ax)^2}{5a}-\frac{3}{20}acx^4$$
$$=\frac{cx\tan^{-1}(ax)}{10a^2}+\frac{1}{10}cx^3\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)^2}{20a^3}-\frac{cx^2\tan^{-1}(ax)^2}{5a}-\frac{3}{20}acx^4$$
$$=\frac{cx\tan^{-1}(ax)}{10a^2}+\frac{1}{10}cx^3\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)^2}{20a^3}-\frac{cx^2\tan^{-1}(ax)^2}{5a}-\frac{3}{20}acx^4$$
$$=-\frac{cx^2}{20a}+\frac{cx\tan^{-1}(ax)}{10a^2}+\frac{1}{10}cx^3\tan^{-1}(ax)-\frac{c\tan^{-1}(ax)^2}{20a^3}-\frac{cx^2\tan^{-1}(ax)^2}{5a}-$$

Mathematica [A] time = 0.57, size = 171, normalized size = 0.81

$$c\left(12a^5x^5\tan^{-1}(ax)^3-9a^4x^4\tan^{-1}(ax)^2+20a^3x^3\tan^{-1}(ax)^3+6a^3x^3\tan^{-1}(ax)-3a^2x^2-12a^2x^2\tan^{-1}(ax)^2-$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*(-3 - 3*a^2*x^2 + 6*a*x*ArcTan[a*x] + 6*a^3*x^3*ArcTan[a*x] - 3*ArcTan[a
*x]^2 - 12*a^2*x^2*ArcTan[a*x]^2 - 9*a^4*x^4*ArcTan[a*x]^2 + (8*I)*ArcTan[a
*x]^3 + 20*a^3*x^3*ArcTan[a*x]^3 + 12*a^5*x^5*ArcTan[a*x]^3 - 24*ArcTan[a*x
]^2*Log[1 + E^((2*I)*ArcTan[a*x])] + (24*I)*ArcTan[a*x]*PolyLog[2, -E^((2*I
)*ArcTan[a*x])] - 12*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/(60*a^3)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^4+cx^2\right)\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^4 + c*x^2)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [C] time = 5.27, size = 2555, normalized size = 12.11

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)*arctan(a*x)^3,x)
```

```
[Out] 1/3*c*x^3*arctan(a*x)^3-3/40*I/a*c*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^
2*x^2+1)+1)^2)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*x^2+3/80*I/a*c*Pi*arct
an(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*x^
2+1)+1))^2*x^2+3/40*I/a*c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2
+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*x^2-3/8
0*I/a*c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(
a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*x^2+1/10*I/a^3*c*Pi*arcta
n(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn
(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))-1/20/a^3*
c-1/5/a^3*c*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-7/80*I/a^3*c*Pi*arctan(a*x)
^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(
1+I*a*x)^2/(a^2*x^2+1)+I)^2-1/5*I/a^3*c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^2
/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/10*I/a^3*c*Pi*arctan(
a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^
2+3/80*I/a*c*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*x^2-3
/80*I/a*c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2
/(a^2*x^2+1)+I)^3*x^2+3/40/a^2*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2
*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2*x-3/80/a^2*c*Pi*csgn(I*(
(1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(
a*x)^2*x+1/80*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2*x^
3-1/80*c*Pi*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)
^3*arctan(a*x)^2*x^3+2/5*I/a^3*c*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^
2+1))-3/80/a^2*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2*x
+3/80/a^2*c*Pi*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)
+I)^3*arctan(a*x)^2*x-1/40*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*csg
n(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2*x^3+1/80*c*Pi*csgn(I*((1+I*a
*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2
*x^3+1/40*c*Pi*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)
+I)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*arctan(a*x)^2*x^3-1/80*c*Pi*csgn(I*
(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2
/(a^2*x^2+1)+I)^2*arctan(a*x)^2*x^3-1/80*I/a^3*c*Pi*arctan(a*x)^2*csgn(I*((
1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+1/10*I/a^3*c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*
x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3-7/80*I/a^3*c*Pi*arctan(a*
x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^3+1/10
*I/a^3*c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3-3/40/a^2*c*Pi*c
sgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*csgn(I*(1+
I*a*x)^2/(a^2*x^2+1)+I)*arctan(a*x)^2*x+3/80/a^2*c*Pi*csgn(I*(1+I*a*x)^4/(a
^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I
)^2*arctan(a*x)^2*x+1/40*I/a^3*c*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*
x^2+1)+1)^2)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))-1/80*I/a^3*c*Pi*arctan(a
*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)
+1))^2-1/10*I/a^3*c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a
*x)^2/(a^2*x^2+1)+1)^2)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)-1/10*I/a^3*
c*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+
1)^2)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))+7/40*I/a^3*c*Pi*arctan(a*x)^2*csgn(
I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*csgn(I*(1+I*a*
x)^2/(a^2*x^2+1)+I)+1/5/a^3*c*arctan(a*x)^2*ln(a^2*x^2+1)-2/5/a^3*c*arctan(
a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-2/5/a^3*c*ln(2)*arctan(a*x)^2+2/15*I
/a^3*c*arctan(a*x)^3-1/20*c*arctan(a*x)^2/a^3+1/10*c*x*arctan(a*x)/a^2-1/5*
c*x^2*arctan(a*x)^2/a-3/20*a*c*x^4*arctan(a*x)^2+1/5*a^2*c*x^5*arctan(a*x)^
3-1/20*c*x^2/a+1/10*c*x^3*arctan(a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{120}\left(3a^2cx^5+5cx^3\right)\arctan\left(ax\right)^3-\frac{1}{160}\left(3a^2cx^5+5cx^3\right)\arctan\left(ax\right)\log\left(a^2x^2+1\right)^2+\int\frac{140\left(a^4cx^6+2a^2cx^4\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/120*(3*a^2*c*x^5 + 5*c*x^3)*arctan(a*x)^3 - 1/160*(3*a^2*c*x^5 + 5*c*x^3)
*arctan(a*x)*log(a^2*x^2 + 1)^2 + integrate(1/160*(140*(a^4*c*x^6 + 2*a^2*c
*x^4 + c*x^2)*arctan(a*x)^3 - 4*(3*a^3*c*x^5 + 5*a*c*x^3)*arctan(a*x)^2 + 4
*(3*a^4*c*x^6 + 5*a^2*c*x^4)*arctan(a*x)*log(a^2*x^2 + 1) + (3*a^3*c*x^5 +
5*a*c*x^3 + 15*(a^4*c*x^6 + 2*a^2*c*x^4 + c*x^2)*arctan(a*x))*log(a^2*x^2 +
 1)^2)/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^3*(c + a^2*c*x^2),x)
```

```
[Out] int(x^2*atan(a*x)^3*(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^2\,\mathrm{atan}^3\left(ax\right)dx+\int a^2x^4\,\mathrm{atan}^3\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)*atan(a*x)**3,x)
```

```
[Out] c*(Integral(x**2*atan(a*x)**3, x) + Integral(a**2*x**4*atan(a*x)**3, x))
```

3.365 $\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=160

$$-\frac{ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{2a^2}+\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)^3}{4a^2}-\frac{cx\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{4a}+\frac{c\left(a^2x^2+1\right)\tan^{-1}(ax)}{4a^2}-\frac{ic\tan^{-1}(ax)^2}{2a^2}-\ldots$$

```
[Out] -1/4*c*x/a+1/4*c*(a^2*x^2+1)*arctan(a*x)/a^2-1/2*I*c*arctan(a*x)^2/a^2-1/2*
c*x*arctan(a*x)^2/a-1/4*c*x*(a^2*x^2+1)*arctan(a*x)^2/a+1/4*c*(a^2*x^2+1)^2
*arctan(a*x)^3/a^2-c*arctan(a*x)*ln(2/(1+I*a*x))/a^2-1/2*I*c*polylog(2,1-2/
(1+I*a*x))/a^2
```

Rubi [A] time = 0.13, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.444, Rules used = {4930, 4880, 4846, 4920, 4854, 2402, 2315, 8}

$$-\frac{ic\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^2}+\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)^3}{4a^2}-\frac{cx\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{4a}+\frac{c\left(a^2x^2+1\right)\tan^{-1}(ax)}{4a^2}-\frac{ic\tan^{-1}(\ldots}{2a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] -(c*x)/(4*a) + (c*(1 + a^2*x^2)*ArcTan[a*x])/(4*a^2) - ((I/2)*c*ArcTan[a*x]
^2)/a^2 - (c*x*ArcTan[a*x]^2)/(2*a) - (c*x*(1 + a^2*x^2)*ArcTan[a*x]^2)/(4*
a) + (c*(1 + a^2*x^2)^2*ArcTan[a*x]^3)/(4*a^2) - (c*ArcTan[a*x]*Log[2/(1 +
I*a*x)])/a^2 - ((I/2)*c*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
```

```
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule steps

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^3\,dx=\frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)^3}{4a^2}-\frac{3\int\left(c+a^2cx^2\right)\tan^{-1}(ax)^2\,dx}{4a}$$

$$=\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{4a^2}-\frac{cx\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{4a}+\frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)^3}{4a^2}$$

$$=-\frac{cx}{4a}+\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{4a^2}-\frac{cx\tan^{-1}(ax)^2}{2a}-\frac{cx\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{4a}+$$

$$=-\frac{cx}{4a}+\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{4a^2}-\frac{ic\tan^{-1}(ax)^2}{2a^2}-\frac{cx\tan^{-1}(ax)^2}{2a}-\frac{cx\left(1+a^2x^2\right.}{4}$$

$$=-\frac{cx}{4a}+\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{4a^2}-\frac{ic\tan^{-1}(ax)^2}{2a^2}-\frac{cx\tan^{-1}(ax)^2}{2a}-\frac{cx\left(1+a^2x^2\right.}{4}$$

$$=-\frac{cx}{4a}+\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{4a^2}-\frac{ic\tan^{-1}(ax)^2}{2a^2}-\frac{cx\tan^{-1}(ax)^2}{2a}-\frac{cx\left(1+a^2x^2\right.}{4}$$

$$=-\frac{cx}{4a}+\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)}{4a^2}-\frac{ic\tan^{-1}(ax)^2}{2a^2}-\frac{cx\tan^{-1}(ax)^2}{2a}-\frac{cx\left(1+a^2x^2\right.}{4}$$

Mathematica [A] time = 0.07, size = 101, normalized size = 0.63

$$\frac{c\left(-\left(a^3x^3+3ax-2i\right)\tan^{-1}(ax)^2+\left(a^2x^2+1\right)^2\tan^{-1}(ax)^3+\tan^{-1}(ax)\left(a^2x^2-4\log\left(1+e^{2i\tan^{-1}(ax)}\right)+1\right)+2\right.}{4a^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*(-(a*x) - (-2*I + 3*a*x + a^3*x^3)*ArcTan[a*x]^2 + (1 + a^2*x^2)^2*ArcTa
n[a*x]^3 + ArcTan[a*x]*(1 + a^2*x^2 - 4*Log[1 + E^((2*I)*ArcTan[a*x])]) + (
2*I)*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))/(4*a^2)
```

fricas [F] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^3+cx\right)\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^3 + c*x)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.12, size = 276, normalized size = 1.72

$$\frac{a^2c\arctan\left(ax\right)^3x^4}{4}+\frac{c\arctan\left(ax\right)^3x^2}{2}-\frac{ac\arctan\left(ax\right)^2x^3}{4}-\frac{3cx\arctan\left(ax\right)^2}{4a}+\frac{c\arctan\left(ax\right)^3}{4a^2}+\frac{c\arctan\left(ax\right)x^2}{4}+\frac{c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)*arctan(a*x)^3,x)
```

```
[Out] 1/4*a^2*c*arctan(a*x)^3*x^4+1/2*c*arctan(a*x)^3*x^2-1/4*a*c*arctan(a*x)^2*x
^3-3/4*c*x*arctan(a*x)^2/a+1/4/a^2*c*arctan(a*x)^3+1/4*c*arctan(a*x)*x^2+1/
2/a^2*c*arctan(a*x)*ln(a^2*x^2+1)-1/4*c*x/a+1/4/a^2*c*arctan(a*x)-1/4*I/a^2
*c*ln(I+a*x)*ln(a^2*x^2+1)+1/4*I/a^2*c*dilog(1/2*I*(a*x-I))-1/4*I/a^2*c*ln(
a*x-I)*ln(-1/2*I*(I+a*x))+1/4*I/a^2*c*ln(a*x-I)*ln(a^2*x^2+1)-1/4*I/a^2*c*d
ilog(-1/2*I*(I+a*x))+1/8*I/a^2*c*ln(I+a*x)^2+1/4*I/a^2*c*ln(I+a*x)*ln(1/2*I
*(a*x-I))-1/8*I/a^2*c*ln(a*x-I)^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^3*(c + a^2*c*x^2),x)
```

```
[Out] int(x*atan(a*x)^3*(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x\,\mathrm{atan}^3\left(ax\right)dx+\int a^2x^3\,\mathrm{atan}^3\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)*atan(a*x)**3,x)
```

```
[Out] c*(Integral(x*atan(a*x)**3, x) + Integral(a**2*x**3*atan(a*x)**3, x))
```

3.366 $\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=172

$$-\frac{c\log\left(a^2x^2+1\right)}{2a}+\frac{1}{3}cx\left(a^2x^2+1\right)\tan^{-1}(ax)^3-\frac{c\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{2a}+\frac{c\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{a}+\frac{2ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)\text{ta}}{a}$$

```
[Out] c*x*arctan(a*x)-1/2*c*(a^2*x^2+1)*arctan(a*x)^2/a+2/3*I*c*arctan(a*x)^3/a+2
/3*c*x*arctan(a*x)^3+1/3*c*x*(a^2*x^2+1)*arctan(a*x)^3+2*c*arctan(a*x)^2*ln
(2/(1+I*a*x))/a-1/2*c*ln(a^2*x^2+1)/a+2*I*c*arctan(a*x)*polylog(2,1-2/(1+I*
a*x))/a+c*polylog(3,1-2/(1+I*a*x))/a
```

Rubi [A] time = 0.18, antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.471, Rules used = {4880, 4846, 4920, 4854, 4884, 4994, 6610, 260}

$$\frac{c\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{a}+\frac{2ic\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a}-\frac{c\log\left(a^2x^2+1\right)}{2a}+\frac{1}{3}cx\left(a^2x^2+1\right)\tan^{-1}(ax)^3-\frac{c}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] c*x*ArcTan[a*x] - (c*(1 + a^2*x^2)*ArcTan[a*x]^2)/(2*a) + (((2*I)/3)*c*ArcT
an[a*x]^3)/a + (2*c*x*ArcTan[a*x]^3)/3 + (c*x*(1 + a^2*x^2)*ArcTan[a*x]^3)/
3 + (2*c*ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/a - (c*Log[1 + a^2*x^2])/(2*a) +
 ((2*I)*c*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/a + (c*PolyLog[3, 1 -
2/(1 + I*a*x)])/a
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^3\,dx = -\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{2a}+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)^3+\frac{1}{3}(2c)\int \tan^{-1}(ax)^3\,dx+$$

$$= cx\tan^{-1}(ax)-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{2a}+\frac{2}{3}cx\tan^{-1}(ax)^3+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(a$$

$$= cx\tan^{-1}(ax)-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{2a}+\frac{2ic\tan^{-1}(ax)^3}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^3+\frac{1}{3}cx\big($$

$$= cx\tan^{-1}(ax)-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{2a}+\frac{2ic\tan^{-1}(ax)^3}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^3+\frac{1}{3}cx\big($$

$$= cx\tan^{-1}(ax)-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{2a}+\frac{2ic\tan^{-1}(ax)^3}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^3+\frac{1}{3}cx\big($$

$$= cx\tan^{-1}(ax)-\frac{c\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{2a}+\frac{2ic\tan^{-1}(ax)^3}{3a}+\frac{2}{3}cx\tan^{-1}(ax)^3+\frac{1}{3}cx\big($$

Mathematica [A] time = 0.05, size = 144, normalized size = 0.84

$$\frac{c\left(2a^3x^3\tan^{-1}(ax)^3-3\log\left(a^2x^2+1\right)-3a^2x^2\tan^{-1}(ax)^2-12i\tan^{-1}(ax)\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)+6\text{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right)\cdot}{6a}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*(6*a*x*ArcTan[a*x] - 3*ArcTan[a*x]^2 - 3*a^2*x^2*ArcTan[a*x]^2 - (4*I)*A
rcTan[a*x]^3 + 6*a*x*ArcTan[a*x]^3 + 2*a^3*x^3*ArcTan[a*x]^3 + 12*ArcTan[a*
x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] - 3*Log[1 + a^2*x^2] - (12*I)*ArcTan[a*
x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + 6*PolyLog[3, -E^((2*I)*ArcTan[a*x])
]))/(6*a)
```

fricas [F] time = 0.79, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^2+c\right)\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 3.23, size = 1635, normalized size = 9.51

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^3,x)
```

```
[Out] -1/2*I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x
^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)
+1)^2)*Pi+c*x*arctan(a*x)^3+c*x*arctan(a*x)+2/a*c*arctan(a*x)^2*ln((1+I*a*x
)/(a^2*x^2+1)^(1/2))+1/3*a^2*c*arctan(a*x)^3*x^3-1/2*a*c*arctan(a*x)^2*x^2-
1/a*c*arctan(a*x)^2*ln(a^2*x^2+1)+2/a*c*ln(2)*arctan(a*x)^2-2/3*I/a*c*arcta
n(a*x)^3-I/a*c*arctan(a*x)+1/4*c*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2
+1)+1)^2)^3*Pi*x-1/4*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(
1+I*a*x)^2/(a^2*x^2+1)+I)^3*Pi*x-2*I/a*c*arctan(a*x)*polylog(2,-(1+I*a*x)^2
/(a^2*x^2+1))+1/4*c*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csg
n(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*Pi*x-1/2*c*arctan(a*x)^2*csgn(I*((1+I*a*
x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*Pi*x+1/2*c*arc
tan(a*x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^
2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*Pi*x-1/4*c*arctan(a*x)^2*csgn(I*(1+I*a*
x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x
^2+1)+I)^2*Pi*x+1/4*I/a*c*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^
2)^3*Pi-1/2*I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2
/(a^2*x^2+1)+1)^2)^3*Pi-1/2*I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2
+1))^3*Pi+1/4*I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I
*a*x)^2/(a^2*x^2+1)+I)^3*Pi-1/2*I/a*c*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^
2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*Pi+1/4*I/a*c*arctan(a*
x)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I
*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*Pi+I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^
2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*Pi+1/4*I/a*c*arctan(a*x)^2*
csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)
*Pi-1/2*I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))^2*Pi-1/2*I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^4/(a^2*x
^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*
Pi+1/2*I/a*c*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2
*x^2+1)+1)^2)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*Pi+1/2*I/a*c*arctan(a*x)^2*
csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*csgn(I/((1+
I*a*x)^2/(a^2*x^2+1)+1)^2)*Pi+1/a*c*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+1/a*c*pol
ylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-1/2/a*c*arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$28\,a^4c\int\frac{x^4\arctan\left(ax\right)^3}{32\left(a^2x^2+1\right)}\,dx+3\,a^4c\int\frac{x^4\arctan\left(ax\right)\log\left(a^2x^2+1\right)^2}{32\left(a^2x^2+1\right)}\,dx+4\,a^4c\int\frac{x^4\arctan\left(ax\right)\log\left(a^2x^2+1\right)}{32\left(a^2x^2+1\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 28*a^4*c*integrate(1/32*x^4*arctan(a*x)^3/(a^2*x^2 + 1), x) + 3*a^4*c*integ
rate(1/32*x^4*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 4*a^4*c*in
tegrate(1/32*x^4*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) - 4*a^3*c*i
ntegrate(1/32*x^3*arctan(a*x)^2/(a^2*x^2 + 1), x) + a^3*c*integrate(1/32*x^
3*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 1/24*(a^2*c*x^3 + 3*c*x)*arctan(a*
x)^3 + 7/32*c*arctan(a*x)^4/a + 56*a^2*c*integrate(1/32*x^2*arctan(a*x)^3/(
a^2*x^2 + 1), x) + 6*a^2*c*integrate(1/32*x^2*arctan(a*x)*log(a^2*x^2 + 1)^
2/(a^2*x^2 + 1), x) + 12*a^2*c*integrate(1/32*x^2*arctan(a*x)*log(a^2*x^2 +
 1)/(a^2*x^2 + 1), x) - 1/32*(a^2*c*x^3 + 3*c*x)*arctan(a*x)*log(a^2*x^2 +
1)^2 - 12*a*c*integrate(1/32*x*arctan(a*x)^2/(a^2*x^2 + 1), x) + 3*a*c*inte
grate(1/32*x*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 3*c*integrate(1/32*arct
an(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3*(c + a^2*c*x^2),x)
```

```
[Out] int(atan(a*x)^3*(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int a^2x^2\,\mathrm{atan}^3\left(ax\right)dx+\int \mathrm{atan}^3\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**3,x)
```

```
[Out] c*(Integral(a**2*x**2*atan(a*x)**3, x) + Integral(atan(a*x)**3, x))
```

3.367 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^3}{x}\,dx$

Optimal. Leaf size=276

$$\frac{1}{2}a^2cx^2\tan^{-1}(ax)^3-\frac{3}{2}ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)+\frac{3}{4}ic\text{Li}_4\left(1-\frac{2}{iax+1}\right)-\frac{3}{4}ic\text{Li}_4\left(\frac{2}{iax+1}-1\right)-\frac{3}{2}ic\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan$$

```
[Out] -3/2*I*c*arctan(a*x)^2-3/2*a*c*x*arctan(a*x)^2+1/2*c*arctan(a*x)^3+1/2*a^2*
c*x^2*arctan(a*x)^3-2*c*arctan(a*x)^3*arctanh(-1+2/(1+I*a*x))-3*c*arctan(a*
x)*ln(2/(1+I*a*x))-3/2*I*c*polylog(2,1-2/(1+I*a*x))-3/2*I*c*arctan(a*x)^2*p
olylog(2,1-2/(1+I*a*x))+3/2*I*c*arctan(a*x)^2*polylog(2,-1+2/(1+I*a*x))-3/2
*c*arctan(a*x)*polylog(3,1-2/(1+I*a*x))+3/2*c*arctan(a*x)*polylog(3,-1+2/(1
+I*a*x))+3/4*I*c*polylog(4,1-2/(1+I*a*x))-3/4*I*c*polylog(4,-1+2/(1+I*a*x))
```

Rubi [A] time = 0.52, antiderivative size = 276, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 14, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.700, Rules used = {4950, 4850, 4988, 4884, 4994, 4998, 6610, 4852, 4916, 4846, 4920, 4854, 2402, 2315}

$$-\frac{3}{2}ic\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{3}{4}ic\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)-\frac{3}{4}ic\text{PolyLog}\left(4,-1+\frac{2}{1+iax}\right)-\frac{3}{2}ic\tan^{-1}(ax)^2\text{P}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x,x]
```

```
[Out] ((-3*I)/2)*c*ArcTan[a*x]^2 - (3*a*c*x*ArcTan[a*x]^2)/2 + (c*ArcTan[a*x]^3)/
2 + (a^2*c*x^2*ArcTan[a*x]^3)/2 + 2*c*ArcTan[a*x]^3*ArcTanh[1 - 2/(1 + I*a*
x)] - 3*c*ArcTan[a*x]*Log[2/(1 + I*a*x)] - ((3*I)/2)*c*PolyLog[2, 1 - 2/(1
+ I*a*x)] - ((3*I)/2)*c*ArcTan[a*x]^2*PolyLog[2, 1 - 2/(1 + I*a*x)] + ((3*I
)/2)*c*ArcTan[a*x]^2*PolyLog[2, -1 + 2/(1 + I*a*x)] - (3*c*ArcTan[a*x]*Poly
Log[3, 1 - 2/(1 + I*a*x)])/2 + (3*c*ArcTan[a*x]*PolyLog[3, -1 + 2/(1 + I*a*
x)])/2 + ((3*I)/4)*c*PolyLog[4, 1 - 2/(1 + I*a*x)] - ((3*I)/4)*c*PolyLog[4,
 -1 + 2/(1 + I*a*x)]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}{x}\,dx = c\int \frac{\tan^{-1}(ax)^3}{x}\,dx + \left(a^2c\right)\int x\tan^{-1}(ax)^3\,dx$$

$$= \frac{1}{2}a^2cx^2\tan^{-1}(ax)^3 + 2c\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right) - (6ac)\int \frac{\tan^{-1}(ax)^2}{}$$

$$= \frac{1}{2}a^2cx^2\tan^{-1}(ax)^3 + 2c\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right) - \frac{1}{2}(3ac)\int \tan^{-1}(ax$$

$$= -\frac{3}{2}acx\tan^{-1}(ax)^2 + \frac{1}{2}c\tan^{-1}(ax)^3 + \frac{1}{2}a^2cx^2\tan^{-1}(ax)^3 + 2c\tan^{-1}(ax)^3\tanh$$

$$= -\frac{3}{2}ic\tan^{-1}(ax)^2 - \frac{3}{2}acx\tan^{-1}(ax)^2 + \frac{1}{2}c\tan^{-1}(ax)^3 + \frac{1}{2}a^2cx^2\tan^{-1}(ax)^3 + 2c$$

$$= -\frac{3}{2}ic\tan^{-1}(ax)^2 - \frac{3}{2}acx\tan^{-1}(ax)^2 + \frac{1}{2}c\tan^{-1}(ax)^3 + \frac{1}{2}a^2cx^2\tan^{-1}(ax)^3 + 2c$$

$$= -\frac{3}{2}ic\tan^{-1}(ax)^2 - \frac{3}{2}acx\tan^{-1}(ax)^2 + \frac{1}{2}c\tan^{-1}(ax)^3 + \frac{1}{2}a^2cx^2\tan^{-1}(ax)^3 + 2c$$

$$= -\frac{3}{2}ic\tan^{-1}(ax)^2 - \frac{3}{2}acx\tan^{-1}(ax)^2 + \frac{1}{2}c\tan^{-1}(ax)^3 + \frac{1}{2}a^2cx^2\tan^{-1}(ax)^3 + 2c$$

Mathematica [A] time = 0.07, size = 284, normalized size = 1.03

$$\frac{1}{2}c\left(a^2x^2+1\right)\tan^{-1}(ax)^3-\frac{3}{4}ic\text{Li}_4\left(\frac{-ax-i}{ax-i}\right)+\frac{3}{4}ic\text{Li}_4\left(\frac{ax+i}{ax-i}\right)+\frac{3}{2}ic\text{Li}_2\left(\frac{-ax-i}{ax-i}\right)\tan^{-1}(ax)^2-\frac{3}{2}ic\text{Li}_2\left(\frac{ax+i}{ax-i}\right)\text{ta}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x,x]
```

```
[Out] (c*(1 + a^2*x^2)*ArcTan[a*x]^3)/2 + 2*c*ArcTan[a*x]^3*ArcTanh[1 - (2*I)/(I
- a*x)] - (3*c*((-I)*ArcTan[a*x]^2 + a*x*ArcTan[a*x]^2 + 2*ArcTan[a*x]*Log[
1 + E^((2*I)*ArcTan[a*x])] - I*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))/2 + ((3
*I)/2)*c*ArcTan[a*x]^2*PolyLog[2, (-I - a*x)/(-I + a*x)] - ((3*I)/2)*c*ArcT
an[a*x]^2*PolyLog[2, (I + a*x)/(-I + a*x)] + (3*c*ArcTan[a*x]*PolyLog[3, (-
I - a*x)/(-I + a*x)])/2 - (3*c*ArcTan[a*x]*PolyLog[3, (I + a*x)/(-I + a*x)]
)/2 - ((3*I)/4)*c*PolyLog[4, (-I - a*x)/(-I + a*x)] + ((3*I)/4)*c*PolyLog[4
, (I + a*x)/(-I + a*x)]
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)\arctan\left(ax\right)^3}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^3/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 6.44, size = 460, normalized size = 1.67

$$\frac{c\arctan\left(ax\right)^2\left(-3-i\arctan\left(ax\right)+\arctan\left(ax\right)xa\right)\left(ax+i\right)}{2}+6ic\,\text{polylog}\left(4,\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-3c\arctan\left(ax\right)\ln\left(\frac{(iax}{a^2x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^3/x,x)
```

```
[Out] 1/2*c*arctan(a*x)^2*(-3-I*arctan(a*x)+arctan(a*x)*x*a)*(I+a*x)-3*I*c*arctan
(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*c*arctan(a*x)*ln((1+I*a*x
)^2/(a^2*x^2+1)+1)+3*I*arctan(a*x)^2*c-c*arctan(a*x)^3*ln((1+I*a*x)^2/(a^2*
x^2+1)+1)+3/2*I*c*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))-3/2*c*arctan(a*x)*pol
ylog(3,-(1+I*a*x)^2/(a^2*x^2+1))+6*I*c*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2
))+c*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/2*I*c*arctan(a*x)^2*
polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+6*c*arctan(a*x)*polylog(3,(1+I*a*x)/(a^
2*x^2+1)^(1/2))+6*I*c*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+c*arctan(a*x)
^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-3/4*I*c*polylog(4,-(1+I*a*x)^2/(a^2*x^
2+1))+6*c*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*c*arctan(
a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{16}a^2cx^2\arctan\left(ax\right)^3-\frac{3}{64}a^2cx^2\arctan\left(ax\right)\log\left(a^2x^2+1\right)^2+\int\frac{12\,a^4cx^4\arctan\left(ax\right)\log\left(a^2x^2+1\right)-12\,a^3cx^3\,\text{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x,x, algorithm="maxima")
```

```
[Out] 1/16*a^2*c*x^2*arctan(a*x)^3 - 3/64*a^2*c*x^2*arctan(a*x)*log(a^2*x^2 + 1)^
2 + integrate(1/64*(12*a^4*c*x^4*arctan(a*x)*log(a^2*x^2 + 1) - 12*a^3*c*x^
3*arctan(a*x)^2 + 56*(a^4*c*x^4 + 2*a^2*c*x^2 + c)*arctan(a*x)^3 + 3*(a^3*c
*x^3 + 2*(a^4*c*x^4 + 2*a^2*c*x^2 + c)*arctan(a*x))*log(a^2*x^2 + 1)^2)/(a^
2*x^3 + x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2))/x,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{\operatorname{atan}^3(ax)}{x}\,dx + \int a^2x\operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**3/x,x)
```

```
[Out] c*(Integral(atan(a*x)**3/x, x) + Integral(a**2*x*atan(a*x)**3, x))
```

3.368 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^3}{x^2}\,dx$

Optimal. Leaf size=169

$$a^2cx\tan^{-1}(ax)^3+\frac{3}{2}ac\text{Li}_3\left(\frac{2}{1-iax}-1\right)+\frac{3}{2}ac\text{Li}_3\left(1-\frac{2}{iax+1}\right)-3iac\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)+3iac\text{Li}_2\left(1-\frac{2}{iax+\ldots}\right.$$

```
[Out] -c*arctan(a*x)^3/x+a^2*c*x*arctan(a*x)^3+3*a*c*arctan(a*x)^2*ln(2/(1+I*a*x)
)+3*a*c*arctan(a*x)^2*ln(2-2/(1-I*a*x))-3*I*a*c*arctan(a*x)*polylog(2,-1+2/
(1-I*a*x))+3*I*a*c*arctan(a*x)*polylog(2,1-2/(1+I*a*x))+3/2*a*c*polylog(3,-
1+2/(1-I*a*x))+3/2*a*c*polylog(3,1-2/(1+I*a*x))
```

Rubi [A] time = 0.39, antiderivative size = 169, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4950, 4852, 4924, 4868, 4884, 4992, 6610, 4846, 4920, 4854, 4994}

$$\frac{3}{2}ac\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)+\frac{3}{2}ac\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)-3iac\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+3iac\tan\ldots$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] -((c*ArcTan[a*x]^3)/x) + a^2*c*x*ArcTan[a*x]^3 + 3*a*c*ArcTan[a*x]^2*Log[2/
(1 + I*a*x)] + 3*a*c*ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)] - (3*I)*a*c*ArcTa
n[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)] + (3*I)*a*c*ArcTan[a*x]*PolyLog[2, 1
- 2/(1 + I*a*x)] + (3*a*c*PolyLog[3, -1 + 2/(1 - I*a*x)])/2 + (3*a*c*PolyLo
g[3, 1 - 2/(1 + I*a*x)])/2
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^3}{x^2}\,dx = c\int \frac{\tan^{-1}(ax)^3}{x^2}\,dx + (a^2c)\int \tan^{-1}(ax)^3\,dx$$
$$= -\frac{c\tan^{-1}(ax)^3}{x} + a^2cx\tan^{-1}(ax)^3 + (3ac)\int \frac{\tan^{-1}(ax)^2}{x(1+a^2x^2)}\,dx - (3a^3c)\int \frac{x\tan^{-1}(a}{1+a^2x}$$
$$= -\frac{c\tan^{-1}(ax)^3}{x} + a^2cx\tan^{-1}(ax)^3 + (3iac)\int \frac{\tan^{-1}(ax)^2}{x(i+ax)}\,dx + (3a^2c)\int \frac{\tan^{-1}(ax)}{i-ax}$$
$$= -\frac{c\tan^{-1}(ax)^3}{x} + a^2cx\tan^{-1}(ax)^3 + 3ac\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right) + 3ac\tan^{-1}(ax)^2$$
$$= -\frac{c\tan^{-1}(ax)^3}{x} + a^2cx\tan^{-1}(ax)^3 + 3ac\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right) + 3ac\tan^{-1}(ax)^2$$
$$= -\frac{c\tan^{-1}(ax)^3}{x} + a^2cx\tan^{-1}(ax)^3 + 3ac\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right) + 3ac\tan^{-1}(ax)^2$$

Mathematica [A] time = 0.18, size = 188, normalized size = 1.11

$$a^2cx\tan^{-1}(ax)^3 - 3iac\tan^{-1}(ax)\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) + \frac{3}{2}ac\text{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right) + ac\left(3i\tan^{-1}(ax)\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) + \frac{3}{2}\text{Li}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] (-I)*a*c*ArcTan[a*x]^3 + a^2*c*x*ArcTan[a*x]^3 + 3*a*c*ArcTan[a*x]^2*Log[1
+ E^((2*I)*ArcTan[a*x])] - (3*I)*a*c*ArcTan[a*x]*PolyLog[2, -E^((2*I)*ArcTa
n[a*x])] + a*c*((-1/8*I)*Pi^3 + I*ArcTan[a*x]^3 - ArcTan[a*x]^3/(a*x) + 3*A
rcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + (3*I)*ArcTan[a*x]*PolyLog[2,
 E^((-2*I)*ArcTan[a*x])] + (3*PolyLog[3, E^((-2*I)*ArcTan[a*x])])/2) + (3*a
*c*PolyLog[3, -E^((2*I)*ArcTan[a*x])])/2
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(a^2cx^2+c)\arctan(ax)^3}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^3/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 0.60, size = 1826, normalized size = 10.80

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^3/x^2,x)
```

```
[Out] 6*a*c*arctan(a*x)^2*ln(2)+3*a*c*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1
/2))+3*a*c*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a*c*arctan(a*x
)^2*ln(a*x)-3*a*c*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+6*a*c*arctan(
a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-3*a*c*arctan(a*x)^2*ln(a^2*x^2+1)-2*
I*a*c*arctan(a*x)^3-3/2*I*a*c*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I
*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+3
/2*I*a*c*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(
a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
)-3*I*a*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x
^2+1)+1)^2)^2*arctan(a*x)^2+3/2*I*a*c*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(
a*x)^2-3/2*I*a*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^
2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*ar
ctan(a*x)^2-3/2*I*a*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a
*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+3*I*a*c*P
i*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*arc
tan(a*x)^2+6*a*c*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*a*c*polylog(3,-(1
+I*a*x)/(a^2*x^2+1)^(1/2))+3/2*a*c*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))+3/2*
I*a*c*Pi*arctan(a*x)^2-3*I*a*c*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+
1))-6*I*a*c*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*a*c*arc
tan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/2*I*a*c*Pi*csgn(I*(1+I*a*
x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1
)^2)^2*arctan(a*x)^2+3/2*I*a*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csg
n(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2-3/2*I*a*c*arctan(a*x)^2*Pi
*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))-3/2*
I*a*c*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*ar
ctan(a*x)^2-3/2*I*a*c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2
*x^2+1)+1))^2*arctan(a*x)^2-3/2*I*a*c*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*
arctan(a*x)^2+3/2*I*a*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a
*x)^2+3/2*I*a*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2
+1)+1))^3*arctan(a*x)^2+3/2*I*a*c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I
*a*x)^2/(a^2*x^2+1)+1))^3*arctan(a*x)^2-c*arctan(a*x)^3/x+a^2*c*x*arctan(a*
x)^3+3/2*I*a*c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(
a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+
1))*arctan(a*x)^2-3/2*I*a*c*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I
*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*
x^2+1)+1)^2)*arctan(a*x)^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2))/x^2,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int a^{2}\operatorname{atan}^{3}(ax)\,dx+\int\frac{\operatorname{atan}^{3}(ax)}{x^{2}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**3/x**2,x)
```

```
[Out] c*(Integral(a**2*atan(a*x)**3, x) + Integral(atan(a*x)**3/x**2, x))
```

3.369 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^3}{x^3}\,dx$

Optimal. Leaf size=310

$$-\frac{3}{2}ia^2c\text{Li}_2\left(\frac{2}{1-iax}-1\right)+\frac{3}{4}ia^2c\text{Li}_4\left(1-\frac{2}{iax+1}\right)-\frac{3}{4}ia^2c\text{Li}_4\left(\frac{2}{iax+1}-1\right)-\frac{3}{2}ia^2c\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)^2+$$

```
[Out] -3/2*I*a^2*c*arctan(a*x)^2-3/2*a*c*arctan(a*x)^2/x-1/2*a^2*c*arctan(a*x)^3-
1/2*c*arctan(a*x)^3/x^2-2*a^2*c*arctan(a*x)^3*arctanh(-1+2/(1+I*a*x))+3*a^2
*c*arctan(a*x)*ln(2-2/(1-I*a*x))-3/2*I*a^2*c*polylog(2,-1+2/(1-I*a*x))-3/2*
I*a^2*c*arctan(a*x)^2*polylog(2,1-2/(1+I*a*x))+3/2*I*a^2*c*arctan(a*x)^2*po
lylog(2,-1+2/(1+I*a*x))-3/2*a^2*c*arctan(a*x)*polylog(3,1-2/(1+I*a*x))+3/2*
a^2*c*arctan(a*x)*polylog(3,-1+2/(1+I*a*x))+3/4*I*a^2*c*polylog(4,1-2/(1+I*
a*x))-3/4*I*a^2*c*polylog(4,-1+2/(1+I*a*x))
```

Rubi [A] time = 0.56, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4950, 4852, 4918, 4924, 4868, 2447, 4884, 4850, 4988, 4994, 4998, 6610}

$$-\frac{3}{2}ia^2c\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+\frac{3}{4}ia^2c\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)-\frac{3}{4}ia^2c\text{PolyLog}\left(4,-1+\frac{2}{1+iax}\right)-\frac{3}{2}ia^2c\ \text{ta}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] ((-3*I)/2)*a^2*c*ArcTan[a*x]^2 - (3*a*c*ArcTan[a*x]^2)/(2*x) - (a^2*c*ArcTa
n[a*x]^3)/2 - (c*ArcTan[a*x]^3)/(2*x^2) + 2*a^2*c*ArcTan[a*x]^3*ArcTanh[1 -
 2/(1 + I*a*x)] + 3*a^2*c*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)] - ((3*I)/2)*a^
2*c*PolyLog[2, -1 + 2/(1 - I*a*x)] - ((3*I)/2)*a^2*c*ArcTan[a*x]^2*PolyLog[
2, 1 - 2/(1 + I*a*x)] + ((3*I)/2)*a^2*c*ArcTan[a*x]^2*PolyLog[2, -1 + 2/(1
+ I*a*x)] - (3*a^2*c*ArcTan[a*x]*PolyLog[3, 1 - 2/(1 + I*a*x)])/2 + (3*a^2*
c*ArcTan[a*x]*PolyLog[3, -1 + 2/(1 + I*a*x)])/2 + ((3*I)/4)*a^2*c*PolyLog[4
, 1 - 2/(1 + I*a*x)] - ((3*I)/4)*a^2*c*PolyLog[4, -1 + 2/(1 + I*a*x)]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}{x^3}\,dx = c\int \frac{\tan^{-1}(ax)^3}{x^3}\,dx + \left(a^2c\right)\int \frac{\tan^{-1}(ax)^3}{x}\,dx$$

$$= -\frac{c\tan^{-1}(ax)^3}{2x^2} + 2a^2c\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right) + \frac{1}{2}(3ac)\int \frac{\tan^{-1}(ax)}{x^2\left(1+a^2x\right.}$$

$$= -\frac{c\tan^{-1}(ax)^3}{2x^2} + 2a^2c\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right) + \frac{1}{2}(3ac)\int \frac{\tan^{-1}(ax)^2}{x^2}$$

$$= -\frac{3ac\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^2c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(ax)^3}{2x^2} + 2a^2c\tan^{-1}(ax)^3\tanh^{-1}\Big($$

$$= -\frac{3}{2}ia^2c\tan^{-1}(ax)^2 - \frac{3ac\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^2c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(ax)^3}{2x^2} + 2a^2c$$

$$= -\frac{3}{2}ia^2c\tan^{-1}(ax)^2 - \frac{3ac\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^2c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(ax)^3}{2x^2} + 2a^2c$$

$$= -\frac{3}{2}ia^2c\tan^{-1}(ax)^2 - \frac{3ac\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^2c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(ax)^3}{2x^2} + 2a^2c$$

Mathematica [A] time = 0.25, size = 337, normalized size = 1.09

$$-\frac{3}{4}ia^2c\text{Li}_4\left(\frac{-ax-i}{ax-i}\right)+\frac{3}{4}ia^2c\text{Li}_4\left(\frac{ax+i}{ax-i}\right)+\frac{3}{2}ia^2c\text{Li}_2\left(\frac{-ax-i}{ax-i}\right)\tan^{-1}(ax)^2-\frac{3}{2}ia^2c\text{Li}_2\left(\frac{ax+i}{ax-i}\right)\tan^{-1}(ax)^2+\frac{3}{2}a^2c$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (a^2*c*ArcTan[a*x]^3)/2 + (c*(-1 - a^2*x^2)*ArcTan[a*x]^3)/(2*x^2) + 2*a^2*
c*ArcTan[a*x]^3*ArcTanh[1 - (2*I)/(I - a*x)] + (3*a^2*c*(-1/3*(ArcTan[a*x]*
((3*ArcTan[a*x])/(a*x) + ArcTan[a*x]*(3*I + ArcTan[a*x]) - 6*Log[1 - E^((2*
I)*ArcTan[a*x])])) - I*PolyLog[2, E^((2*I)*ArcTan[a*x])]))/2 + ((3*I)/2)*a^
2*c*ArcTan[a*x]^2*PolyLog[2, (-I - a*x)/(-I + a*x)] - ((3*I)/2)*a^2*c*ArcTa
n[a*x]^2*PolyLog[2, (I + a*x)/(-I + a*x)] + (3*a^2*c*ArcTan[a*x]*PolyLog[3,
 (-I - a*x)/(-I + a*x)])/2 - (3*a^2*c*ArcTan[a*x]*PolyLog[3, (I + a*x)/(-I
+ a*x)])/2 - ((3*I)/4)*a^2*c*PolyLog[4, (-I - a*x)/(-I + a*x)] + ((3*I)/4)*
a^2*c*PolyLog[4, (I + a*x)/(-I + a*x)]
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)\arctan(ax)^3}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^3/x^3, x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**B**] time = 10.36, size = 568, normalized size = 1.83

$$-\frac{a^2c\arctan(ax)^3}{2}-3ia^2c\,\mathrm{polylog}\left(2,-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-\frac{3ac\arctan(ax)^2}{2x}-\frac{c\arctan(ax)^3}{2x^2}-3ia^2c\arctan(ax)^2\,\mathrm{polylog}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^3/x^3,x)
```

```
[Out] -1/2*a^2*c*arctan(a*x)^3-3/4*I*a^2*c*polylog(4,-(1+I*a*x)^2/(a^2*x^2+1))-3/
2*a*c*arctan(a*x)^2/x-1/2*c*arctan(a*x)^3/x^2-3/2*I*a^2*c*arctan(a*x)^2+a^2
*c*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*a^2*c*polylog(4,(1+I
*a*x)/(a^2*x^2+1)^(1/2))+6*a^2*c*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1
)^(1/2))-3*I*a^2*c*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-3/2
*a^2*c*arctan(a*x)*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-3*I*a^2*c*polylog(2,
-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2*c*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1
)^(1/2))-3*I*a^2*c*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-a^
2*c*arctan(a*x)^3*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+3/2*I*a^2*c*arctan(a*x)^2*p
olylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+a^2*c*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*
x^2+1)^(1/2))-3*I*a^2*c*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2*c*arct
an(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*a^2*c*arctan(a*x)*polylog(3,-(1
+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*a^2*c*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)
```

maxima [**F**] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{4\,c\arctan(ax)^3-3\,c\arctan(ax)\log\left(a^2x^2+1\right)^2+x^2\int\frac{12\,a^2cx^2\arctan(ax)\log\left(a^2x^2+1\right)-12\,acx\arctan(ax)^2-56\left(a^4cx^4+2\,a^2cx^2+\right.}{a^2x^5+}}{64\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^3,x, algorithm="maxima")
```

```
[Out] -1/64*(4*c*arctan(a*x)^3 - 3*c*arctan(a*x)*log(a^2*x^2 + 1)^2 - 64*x^2*inte
grate(-1/64*(12*a^2*c*x^2*arctan(a*x)*log(a^2*x^2 + 1) - 12*a*c*x*arctan(a*
x)^2 - 56*(a^4*c*x^4 + 2*a^2*c*x^2 + c)*arctan(a*x)^3 + 3*(a*c*x - 2*(a^4*c
*x^4 + 2*a^2*c*x^2 + c)*arctan(a*x))*log(a^2*x^2 + 1)^2)/(a^2*x^5 + x^3), x
))/x^2
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2))/x^3,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{\operatorname{atan}^{3}(ax)}{x^{3}}\,dx + \int \frac{a^{2}\operatorname{atan}^{3}(ax)}{x}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**3/x**3,x)
```

```
[Out] c*(Integral(atan(a*x)**3/x**3, x) + Integral(a**2*atan(a*x)**3/x, x))
```

3.370 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^3}{x^4}\,dx$

Optimal. Leaf size=189

$$a^3c\text{Li}_3\left(\frac{2}{1-iax}-1\right)-2ia^3c\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)+a^3c\log(x)-\frac{2}{3}ia^3c\tan^{-1}(ax)^3-\frac{1}{2}a^3c\tan^{-1}(ax)^2+2a^3c\log\left(\right.$$

```
[Out] -a^2*c*arctan(a*x)/x-1/2*a^3*c*arctan(a*x)^2-1/2*a*c*arctan(a*x)^2/x^2-2/3*
I*a^3*c*arctan(a*x)^3-1/3*c*arctan(a*x)^3/x^3-a^2*c*arctan(a*x)^3/x+a^3*c*l
n(x)-1/2*a^3*c*ln(a^2*x^2+1)+2*a^3*c*arctan(a*x)^2*ln(2-2/(1-I*a*x))-2*I*a^
3*c*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))+a^3*c*polylog(3,-1+2/(1-I*a*x))
```

Rubi [A] time = 0.58, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 12, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.600, Rules used = {4950, 4852, 4918, 266, 36, 29, 31, 4884, 4924, 4868, 4992, 6610}

$$a^3c\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)-2ia^3c\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{1}{2}a^3c\log\left(a^2x^2+1\right)+a^3c\log(x)-\frac{2}{3}ia^3c$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] -((a^2*c*ArcTan[a*x])/x) - (a^3*c*ArcTan[a*x]^2)/2 - (a*c*ArcTan[a*x]^2)/(2
*x^2) - ((2*I)/3)*a^3*c*ArcTan[a*x]^3 - (c*ArcTan[a*x]^3)/(3*x^3) - (a^2*c*
ArcTan[a*x]^3)/x + a^3*c*Log[x] - (a^3*c*Log[1 + a^2*x^2])/2 + 2*a^3*c*ArcT
an[a*x]^2*Log[2 - 2/(1 - I*a*x)] - (2*I)*a^3*c*ArcTan[a*x]*PolyLog[2, -1 +
2/(1 - I*a*x)] + a^3*c*PolyLog[3, -1 + 2/(1 - I*a*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^3}{x^4}\,dx = c\int \frac{\tan^{-1}(ax)^3}{x^4}\,dx + (a^2c)\int \frac{\tan^{-1}(ax)^3}{x^2}\,dx$$

$$= -\frac{c\tan^{-1}(ax)^3}{3x^3} - \frac{a^2c\tan^{-1}(ax)^3}{x} + (ac)\int \frac{\tan^{-1}(ax)^2}{x^3(1+a^2x^2)}\,dx + (3a^3c)\int \frac{\tan^{-1}(ax)}{x(1+a^2x}$$

$$= -ia^3c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(ax)^3}{3x^3} - \frac{a^2c\tan^{-1}(ax)^3}{x} + (ac)\int \frac{\tan^{-1}(ax)^2}{x^3}\,dx + (3ia$$

$$= -\frac{ac\tan^{-1}(ax)^2}{2x^2} - \frac{2}{3}ia^3c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(ax)^3}{3x^3} - \frac{a^2c\tan^{-1}(ax)^3}{x} + 3a^3c\tan^{-1}$$

$$= -\frac{ac\tan^{-1}(ax)^2}{2x^2} - \frac{2}{3}ia^3c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(ax)^3}{3x^3} - \frac{a^2c\tan^{-1}(ax)^3}{x} + 2a^3c\tan^{-1}$$

$$= -\frac{a^2c\tan^{-1}(ax)}{x} - \frac{1}{2}a^3c\tan^{-1}(ax)^2 - \frac{ac\tan^{-1}(ax)^2}{2x^2} - \frac{2}{3}ia^3c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(}{3x^3}$$

$$= -\frac{a^2c\tan^{-1}(ax)}{x} - \frac{1}{2}a^3c\tan^{-1}(ax)^2 - \frac{ac\tan^{-1}(ax)^2}{2x^2} - \frac{2}{3}ia^3c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(}{3x^3}$$

$$= -\frac{a^2c\tan^{-1}(ax)}{x} - \frac{1}{2}a^3c\tan^{-1}(ax)^2 - \frac{ac\tan^{-1}(ax)^2}{2x^2} - \frac{2}{3}ia^3c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(}{3x^3}$$

$$= -\frac{a^2c\tan^{-1}(ax)}{x} - \frac{1}{2}a^3c\tan^{-1}(ax)^2 - \frac{ac\tan^{-1}(ax)^2}{2x^2} - \frac{2}{3}ia^3c\tan^{-1}(ax)^3 - \frac{c\tan^{-1}(}{3x^3}$$

Mathematica [A] time = 0.39, size = 177, normalized size = 0.94

$$\frac{1}{12}c\left(24ia^3\tan^{-1}(ax)\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) + 12a^3\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) + 8ia^3\tan^{-1}(ax)^3 - 6a^3\tan^{-1}(ax)^2 + 24a^3\tan^{-1}(a\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] (c*((-I)*a^3*Pi^3 - (12*a^2*ArcTan[a*x])/x - 6*a^3*ArcTan[a*x]^2 - (6*a*Arc
Tan[a*x]^2)/x^2 + (8*I)*a^3*ArcTan[a*x]^3 - (4*ArcTan[a*x]^3)/x^3 - (12*a^2
*ArcTan[a*x]^3)/x + 24*a^3*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] +
12*a^3*Log[(a*x)/Sqrt[1 + a^2*x^2]] + (24*I)*a^3*ArcTan[a*x]*PolyLog[2, E^(
(-2*I)*ArcTan[a*x])] + 12*a^3*PolyLog[3, E^((-2*I)*ArcTan[a*x])]))/12
```

fricas [F] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(a^2cx^2+c)\arctan(ax)^3}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*arctan(a*x)^3/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^4,x, algorithm="giac")
[Out] Timed out
```

maple [C] time = 3.71, size = 5426, normalized size = 28.71

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^3/x^4,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^3/x^4,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2))/x^4,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{\operatorname{atan}^{3}{\left(ax \right)}}{x^{4}}\, dx + \int \frac{a^{2}\operatorname{atan}^{3}{\left(ax \right)}}{x^{2}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**3/x**4,x)
[Out] c*(Integral(atan(a*x)**3/x**4, x) + Integral(a**2*atan(a*x)**3/x**2, x))
```

3.371 $\int x^3 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=313

$$\frac{2ic^2\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{21a^4}+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^3-\frac{c^2\tan^{-1}(ax)^3}{24a^4}+\frac{2ic^2\tan^{-1}(ax)^2}{21a^4}-\frac{c^2\tan^{-1}(ax)}{21a^4}+\frac{4c^2\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)}{21a^4}$$

```
[Out] 1/21*c^2*x/a^3-1/168*c^2*x^3/a-1/280*a*c^2*x^5-1/21*c^2*arctan(a*x)/a^4-5/1
68*c^2*x^2*arctan(a*x)/a^2+1/28*c^2*x^4*arctan(a*x)+1/56*a^2*c^2*x^6*arctan
(a*x)+2/21*I*c^2*arctan(a*x)^2/a^4+1/8*c^2*x*arctan(a*x)^2/a^3-1/24*c^2*x^3
*arctan(a*x)^2/a-1/8*a*c^2*x^5*arctan(a*x)^2-3/56*a^3*c^2*x^7*arctan(a*x)^2
-1/24*c^2*arctan(a*x)^3/a^4+1/4*c^2*x^4*arctan(a*x)^3+1/3*a^2*c^2*x^6*arcta
n(a*x)^3+1/8*a^4*c^2*x^8*arctan(a*x)^3+4/21*c^2*arctan(a*x)*ln(2/(1+I*a*x))
/a^4+2/21*I*c^2*polylog(2,1-2/(1+I*a*x))/a^4
```

Rubi [A] time = 2.28, antiderivative size = 313, normalized size of antiderivative = 1.00, number of steps used = 106, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4948, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 4846, 4884, 302}

$$\frac{2ic^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{21a^4}+\frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^3-\frac{3}{56}a^3c^2x^7\tan^{-1}(ax)^2+\frac{1}{3}a^2c^2x^6\tan^{-1}(ax)^3+\frac{1}{56}a^2c^2x^6\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] (c^2*x)/(21*a^3) - (c^2*x^3)/(168*a) - (a*c^2*x^5)/280 - (c^2*ArcTan[a*x])/
(21*a^4) - (5*c^2*x^2*ArcTan[a*x])/(168*a^2) + (c^2*x^4*ArcTan[a*x])/28 + (
a^2*c^2*x^6*ArcTan[a*x])/56 + (((2*I)/21)*c^2*ArcTan[a*x]^2)/a^4 + (c^2*x*A
rcTan[a*x]^2)/(8*a^3) - (c^2*x^3*ArcTan[a*x]^2)/(24*a) - (a*c^2*x^5*ArcTan[
a*x]^2)/8 - (3*a^3*c^2*x^7*ArcTan[a*x]^2)/56 - (c^2*ArcTan[a*x]^3)/(24*a^4)
 + (c^2*x^4*ArcTan[a*x]^3)/4 + (a^2*c^2*x^6*ArcTan[a*x]^3)/3 + (a^4*c^2*x^8
*ArcTan[a*x]^3)/8 + (4*c^2*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(21*a^4) + (((2*
I)/21)*c^2*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^4
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^3 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3\,dx = \int \left(c^2x^3\tan^{-1}(ax)^3 + 2a^2c^2x^5\tan^{-1}(ax)^3 + a^4c^2x^7\tan^{-1}(ax)^3\right)dx$$

$$= c^2\int x^3\tan^{-1}(ax)^3\,dx + \left(2a^2c^2\right)\int x^5\tan^{-1}(ax)^3\,dx + \left(a^4c^2\right)\int x^7\tan^{-1}(ax)^3$$

$$= \frac{1}{4}c^2x^4\tan^{-1}(ax)^3 + \frac{1}{3}a^2c^2x^6\tan^{-1}(ax)^3 + \frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^3 - \frac{1}{4}\left(3ac^2\right)\int$$

$$= \frac{1}{4}c^2x^4\tan^{-1}(ax)^3 + \frac{1}{3}a^2c^2x^6\tan^{-1}(ax)^3 + \frac{1}{8}a^4c^2x^8\tan^{-1}(ax)^3 - \frac{\left(3c^2\right)\int x^2\tan}{4a}$$

$$= -\frac{c^2x^3\tan^{-1}(ax)^2}{4a} - \frac{1}{5}ac^2x^5\tan^{-1}(ax)^2 - \frac{3}{56}a^3c^2x^7\tan^{-1}(ax)^2 + \frac{1}{4}c^2x^4\tan^{-1}($$

$$= \frac{3c^2x\tan^{-1}(ax)^2}{4a^3} + \frac{c^2x^3\tan^{-1}(ax)^2}{12a} - \frac{1}{8}ac^2x^5\tan^{-1}(ax)^2 - \frac{3}{56}a^3c^2x^7\tan^{-1}(ax)$$

$$= \frac{c^2x^2\tan^{-1}(ax)}{4a^2} + \frac{1}{10}c^2x^4\tan^{-1}(ax) + \frac{1}{56}a^2c^2x^6\tan^{-1}(ax) + \frac{ic^2\tan^{-1}(ax)^2}{a^4} -$$

$$= -\frac{c^2x}{4a^3} - \frac{17c^2x^2\tan^{-1}(ax)}{60a^2} + \frac{1}{28}c^2x^4\tan^{-1}(ax) + \frac{1}{56}a^2c^2x^6\tan^{-1}(ax) - \frac{8ic^2\tan}{15}$$

$$= \frac{307c^2x}{840a^3} - \frac{23c^2x^3}{840a} - \frac{1}{280}ac^2x^5 + \frac{c^2\tan^{-1}(ax)}{4a^4} - \frac{5c^2x^2\tan^{-1}(ax)}{168a^2} + \frac{1}{28}c^2x^4\tan$$

$$= \frac{c^2x}{21a^3} - \frac{c^2x^3}{168a} - \frac{1}{280}ac^2x^5 - \frac{307c^2\tan^{-1}(ax)}{840a^4} - \frac{5c^2x^2\tan^{-1}(ax)}{168a^2} + \frac{1}{28}c^2x^4\tan$$

$$= \frac{c^2x}{21a^3} - \frac{c^2x^3}{168a} - \frac{1}{280}ac^2x^5 - \frac{c^2\tan^{-1}(ax)}{21a^4} - \frac{5c^2x^2\tan^{-1}(ax)}{168a^2} + \frac{1}{28}c^2x^4\tan^{-1}(a$$

$$= \frac{c^2x}{21a^3} - \frac{c^2x^3}{168a} - \frac{1}{280}ac^2x^5 - \frac{c^2\tan^{-1}(ax)}{21a^4} - \frac{5c^2x^2\tan^{-1}(ax)}{168a^2} + \frac{1}{28}c^2x^4\tan^{-1}(a$$

Mathematica [A] time = 1.33, size = 165, normalized size = 0.53

$$\frac{c^2\left(-3a^5x^5 - 5a^3x^3 + 35\left(a^2x^2+1\right)^3\left(3a^2x^2-1\right)\tan^{-1}(ax)^3 - 5\left(9a^7x^7 + 21a^5x^5 + 7a^3x^3 - 21ax + 16i\right)\tan^{-1}(ax)\right.}{840a^4}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] (c^2*(40*a*x - 5*a^3*x^3 - 3*a^5*x^5 - 5*(16*I - 21*a*x + 7*a^3*x^3 + 21*a^
5*x^5 + 9*a^7*x^7)*ArcTan[a*x]^2 + 35*(1 + a^2*x^2)^3*(-1 + 3*a^2*x^2)*ArcT
an[a*x]^3 + 5*ArcTan[a*x]*(-8 - 5*a^2*x^2 + 6*a^4*x^4 + 3*a^6*x^6 + 32*Log[
1 + E^((2*I)*ArcTan[a*x])]) - (80*I)*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))/(
840*a^4)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^7 + 2\,a^2c^2x^5 + c^2x^3\right)\arctan(ax)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.16, size = 411, normalized size = 1.31

$$\frac{a^4c^2x^8 \arctan(ax)^3}{8}+\frac{a^2c^2x^6 \arctan(ax)^3}{3}+\frac{c^2x^4 \arctan(ax)^3}{4}-\frac{3a^3c^2x^7 \arctan(ax)^2}{56}-\frac{a\,c^2x^5 \arctan(ax)^2}{8}-\frac{c^2x^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^3,x)
[Out] 1/8*a^4*c^2*x^8*arctan(a*x)^3+1/3*a^2*c^2*x^6*arctan(a*x)^3+1/4*c^2*x^4*arc
tan(a*x)^3-3/56*a^3*c^2*x^7*arctan(a*x)^2-1/8*a*c^2*x^5*arctan(a*x)^2-1/24*
c^2*x^3*arctan(a*x)^2/a+1/8*c^2*x*arctan(a*x)^2/a^3-1/24*c^2*arctan(a*x)^3/
a^4+1/56*a^2*c^2*x^6*arctan(a*x)+1/28*c^2*x^4*arctan(a*x)-5/168*c^2*x^2*arc
tan(a*x)/a^2-2/21/a^4*c^2*arctan(a*x)*ln(a^2*x^2+1)-1/280*a*c^2*x^5-1/168*c
^2*x^3/a+1/21*c^2*x/a^3-1/21*c^2*arctan(a*x)/a^4-1/21*I/a^4*c^2*ln(a*x-I)*l
n(a^2*x^2+1)+1/21*I/a^4*c^2*ln(a*x-I)*ln(-1/2*I*(I+a*x))+1/21*I/a^4*c^2*dil
og(-1/2*I*(I+a*x))+1/21*I/a^4*c^2*ln(I+a*x)*ln(a^2*x^2+1)-1/42*I/a^4*c^2*ln
(I+a*x)^2-1/21*I/a^4*c^2*dilog(1/2*I*(a*x-I))+1/42*I/a^4*c^2*ln(a*x-I)^2-1/
21*I/a^4*c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 \operatorname{atan}(a\,x)^3 \left(c\,a^2\,x^2+c\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^2,x)
[Out] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x^3 \operatorname{atan}^3(ax)\,dx+\int 2a^2x^5 \operatorname{atan}^3(ax)\,dx+\int a^4x^7 \operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**2*atan(a*x)**3,x)
[Out] c**2*(Integral(x**3*atan(a*x)**3, x) + Integral(2*a**2*x**5*atan(a*x)**3, x
) + Integral(a**4*x**7*atan(a*x)**3, x))
```

3.372 $\int x^2 \left(c + a^2 c x^2\right)^2 \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=321

$$\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^3-\frac{4c^2\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{35a^3}-\frac{8ic^2\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{35a^3}-\frac{1}{14}a^3c^2x^6\tan^{-1}(ax)^2-\frac{8ic^2\tan^{-1}(ax)^3}{105a^3}+\frac{c^2}{}$$

```
[Out] -11/420*c^2*x^2/a-1/140*a*c^2*x^4-1/70*c^2*x*arctan(a*x)/a^2+17/210*c^2*x^3
*arctan(a*x)+1/35*a^2*c^2*x^5*arctan(a*x)+1/140*c^2*arctan(a*x)^2/a^3-4/35*
c^2*x^2*arctan(a*x)^2/a-27/140*a*c^2*x^4*arctan(a*x)^2-1/14*a^3*c^2*x^6*arc
tan(a*x)^2-8/105*I*c^2*arctan(a*x)^3/a^3+1/3*c^2*x^3*arctan(a*x)^3+2/5*a^2*
c^2*x^5*arctan(a*x)^3+1/7*a^4*c^2*x^7*arctan(a*x)^3-8/35*c^2*arctan(a*x)^2*
ln(2/(1+I*a*x))/a^3+1/30*c^2*ln(a^2*x^2+1)/a^3-8/35*I*c^2*arctan(a*x)*polyl
og(2,1-2/(1+I*a*x))/a^3-4/35*c^2*polylog(3,1-2/(1+I*a*x))/a^3
```

Rubi [A] time = 1.80, antiderivative size = 321, normalized size of antiderivative = 1.00, number of steps used = 73, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4948, 4852, 4916, 4846, 260, 4884, 4920, 4854, 4994, 6610, 266, 43}

$$-\frac{4c^2\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{35a^3}-\frac{8ic^2\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{35a^3}+\frac{c^2\log\left(a^2x^2+1\right)}{30a^3}+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^3-\frac{1}{14}a^3$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] (-11*c^2*x^2)/(420*a) - (a*c^2*x^4)/140 - (c^2*x*ArcTan[a*x])/(70*a^2) + (1
7*c^2*x^3*ArcTan[a*x])/210 + (a^2*c^2*x^5*ArcTan[a*x])/35 + (c^2*ArcTan[a*x
]^2)/(140*a^3) - (4*c^2*x^2*ArcTan[a*x]^2)/(35*a) - (27*a*c^2*x^4*ArcTan[a*
x]^2)/140 - (a^3*c^2*x^6*ArcTan[a*x]^2)/14 - (((8*I)/105)*c^2*ArcTan[a*x]^3
)/a^3 + (c^2*x^3*ArcTan[a*x]^3)/3 + (2*a^2*c^2*x^5*ArcTan[a*x]^3)/5 + (a^4*
c^2*x^7*ArcTan[a*x]^3)/7 - (8*c^2*ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/(35*a^3
) + (c^2*Log[1 + a^2*x^2])/(30*a^3) - (((8*I)/35)*c^2*ArcTan[a*x]*PolyLog[2
, 1 - 2/(1 + I*a*x)])/a^3 - (4*c^2*PolyLog[3, 1 - 2/(1 + I*a*x)])/(35*a^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3\,dx=\int\left(c^2x^2\tan^{-1}(ax)^3+2a^2c^2x^4\tan^{-1}(ax)^3+a^4c^2x^6\tan^{-1}(ax)^3\right)dx$$

$$=c^2\int x^2\tan^{-1}(ax)^3\,dx+\left(2a^2c^2\right)\int x^4\tan^{-1}(ax)^3\,dx+\left(a^4c^2\right)\int x^6\tan^{-1}(ax)^3$$

$$=\frac{1}{3}c^2x^3\tan^{-1}(ax)^3+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)^3+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^3-\left(ac^2\right)\int\frac{x^3\tan}{1-}$$

$$=\frac{1}{3}c^2x^3\tan^{-1}(ax)^3+\frac{2}{5}a^2c^2x^5\tan^{-1}(ax)^3+\frac{1}{7}a^4c^2x^7\tan^{-1}(ax)^3-\frac{c^2\int x\tan^{-1}(}{a}$$

$$=-\frac{c^2x^2\tan^{-1}(ax)^2}{2a}-\frac{3}{10}ac^2x^4\tan^{-1}(ax)^2-\frac{1}{14}a^3c^2x^6\tan^{-1}(ax)^2-\frac{ic^2\tan^{-1}(ax}{3a^3}$$

$$=\frac{c^2x^2\tan^{-1}(ax)^2}{10a}-\frac{27}{140}ac^2x^4\tan^{-1}(ax)^2-\frac{1}{14}a^3c^2x^6\tan^{-1}(ax)^2+\frac{ic^2\tan^{-1}(ax}{15a^3}$$

$$=\frac{c^2x\tan^{-1}(ax)}{a^2}+\frac{1}{5}c^2x^3\tan^{-1}(ax)+\frac{1}{35}a^2c^2x^5\tan^{-1}(ax)-\frac{c^2\tan^{-1}(ax)^2}{2a^3}-\frac{4c^2}{}$$

$$=-\frac{4c^2x\tan^{-1}(ax)}{5a^2}+\frac{17}{210}c^2x^3\tan^{-1}(ax)+\frac{1}{35}a^2c^2x^5\tan^{-1}(ax)+\frac{2c^2\tan^{-1}(ax)^2}{5a^3}$$

$$=-\frac{c^2x\tan^{-1}(ax)}{70a^2}+\frac{17}{210}c^2x^3\tan^{-1}(ax)+\frac{1}{35}a^2c^2x^5\tan^{-1}(ax)+\frac{c^2\tan^{-1}(ax)^2}{140a^3}-$$

$$=-\frac{3c^2x^2}{35a}-\frac{1}{140}ac^2x^4-\frac{c^2x\tan^{-1}(ax)}{70a^2}+\frac{17}{210}c^2x^3\tan^{-1}(ax)+\frac{1}{35}a^2c^2x^5\tan^{-1}(a$$

$$=-\frac{11c^2x^2}{420a}-\frac{1}{140}ac^2x^4-\frac{c^2x\tan^{-1}(ax)}{70a^2}+\frac{17}{210}c^2x^3\tan^{-1}(ax)+\frac{1}{35}a^2c^2x^5\tan^{-1}($$

Mathematica [A] time = 1.19, size = 233, normalized size = 0.73

$$\frac{c^2\left(60a^7x^7\tan^{-1}(ax)^3-30a^6x^6\tan^{-1}(ax)^2+168a^5x^5\tan^{-1}(ax)^3+12a^5x^5\tan^{-1}(ax)-3a^4x^4-81a^4x^4\tan^{-1}(ax)^2}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] (c^2*(-8 - 11*a^2*x^2 - 3*a^4*x^4 - 6*a*x*ArcTan[a*x] + 34*a^3*x^3*ArcTan[a
*x] + 12*a^5*x^5*ArcTan[a*x] + 3*ArcTan[a*x]^2 - 48*a^2*x^2*ArcTan[a*x]^2 -
 81*a^4*x^4*ArcTan[a*x]^2 - 30*a^6*x^6*ArcTan[a*x]^2 + (32*I)*ArcTan[a*x]^3
 + 140*a^3*x^3*ArcTan[a*x]^3 + 168*a^5*x^5*ArcTan[a*x]^3 + 60*a^7*x^7*ArcTa
n[a*x]^3 - 96*ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] + 14*Log[1 + a^2
*x^2] + (96*I)*ArcTan[a*x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] - 48*PolyLog[
3, -E^((2*I)*ArcTan[a*x])]))/(420*a^3)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^6+2\,a^2c^2x^4+c^2x^2\right)\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 16.69, size = 1121, normalized size = 3.49

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^3,x)
```

```
[Out] 1/140*c^2*arctan(a*x)^2/a^3+1/3*c^2*x^3*arctan(a*x)^3-1/70*c^2*x*arctan(a*x
)/a^2-4/35*c^2*x^2*arctan(a*x)^2/a-27/140*a*c^2*x^4*arctan(a*x)^2-1/14*a^3*
c^2*x^6*arctan(a*x)^2+2/5*a^2*c^2*x^5*arctan(a*x)^3+1/7*a^4*c^2*x^7*arctan(
a*x)^3-2/35*I/a^3*c^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*
a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2-2/35*I/a^
3*c^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1
+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2-2/35*I/a^3*c^2*Pi*csgn(I*((1+I*
a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^
2+8/35*I/a^3*c^2*arctan(a*x)*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+2/35*I/a^3
*c^2*Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x
)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)-1/15/a^3*c^2*ln((1+I*a*x)^2/(a^2*x^2+1)+1)-4/35/a^3*c^2*polylog(3,-(1+I
*a*x)^2/(a^2*x^2+1))+4/35*I/a^3*c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*
csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2-4/35*I/a^3*c^2*Pi*csg
n(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*arctan(a
*x)^2+2/35*I/a^3*c^2*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a
*x)^2/(a^2*x^2+1))*arctan(a*x)^2+2/35*I/a^3*c^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*
x^2+1))^3*arctan(a*x)^2+2/35*I/a^3*c^2*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/
(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3-2/35*I/a^3*c^2*Pi*csgn(I*((1+I
*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2-1/140*a*c^2*x^4-8/35/a^3*c^2*arct
an(a*x)^2*ln(2)+4/35/a^3*c^2*arctan(a*x)^2*ln(a^2*x^2+1)-8/35/a^3*c^2*arcta
n(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+1/15*I/a^3*c^2*arctan(a*x)+8/105*I
/a^3*c^2*arctan(a*x)^3+1/35*a^2*c^2*x^5*arctan(a*x)-2/105/a^3*c^2-11/420*c^
2*x^2/a+17/210*c^2*x^3*arctan(a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{840}\left(15\,a^4c^2x^7+42\,a^2c^2x^5+35\,c^2x^3\right)\arctan\left(ax\right)^3-\frac{1}{1120}\left(15\,a^4c^2x^7+42\,a^2c^2x^5+35\,c^2x^3\right)\arctan\left(ax\right)\log\left(a\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/840*(15*a^4*c^2*x^7 + 42*a^2*c^2*x^5 + 35*c^2*x^3)*arctan(a*x)^3 - 1/1120
*(15*a^4*c^2*x^7 + 42*a^2*c^2*x^5 + 35*c^2*x^3)*arctan(a*x)*log(a^2*x^2 + 1
)^2 + integrate(1/1120*(980*(a^6*c^2*x^8 + 3*a^4*c^2*x^6 + 3*a^2*c^2*x^4 +
c^2*x^2)*arctan(a*x)^3 - 4*(15*a^5*c^2*x^7 + 42*a^3*c^2*x^5 + 35*a*c^2*x^3)
*arctan(a*x)^2 + 4*(15*a^6*c^2*x^8 + 42*a^4*c^2*x^6 + 35*a^2*c^2*x^4)*arcta
n(a*x)*log(a^2*x^2 + 1) + (15*a^5*c^2*x^7 + 42*a^3*c^2*x^5 + 35*a*c^2*x^3 +
 105*(a^6*c^2*x^8 + 3*a^4*c^2*x^6 + 3*a^2*c^2*x^4 + c^2*x^2)*arctan(a*x))*l
og(a^2*x^2 + 1)^2)/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2 \operatorname{atan}(a x)^3 \left(c a^2 x^2 + c\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2 \left(\int x^2 \operatorname{atan}^3(ax)\, dx + \int 2a^2x^4 \operatorname{atan}^3(ax)\, dx + \int a^4x^6 \operatorname{atan}^3(ax)\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**2*atan(a*x)**3,x)
```

```
[Out] c**2*(Integral(x**2*atan(a*x)**3, x) + Integral(2*a**2*x**4*atan(a*x)**3, x
) + Integral(a**4*x**6*atan(a*x)**3, x))
```

3.373 $\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=242

$$-\frac{4ic^2\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{15a^2}-\frac{c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}{10a}-\frac{2c^2x\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{15a}+\frac{c^2\left(a^2x^2+1\right)^3\tan^{-1}(ax)^3}{6a^2}+\frac{c^2\left(\right.}{}$$

```
[Out] -11/60*c^2*x/a-1/60*a*c^2*x^3+2/15*c^2*(a^2*x^2+1)*arctan(a*x)/a^2+1/20*c^2
*(a^2*x^2+1)^2*arctan(a*x)/a^2-4/15*I*c^2*arctan(a*x)^2/a^2-4/15*c^2*x*arct
an(a*x)^2/a-2/15*c^2*x*(a^2*x^2+1)*arctan(a*x)^2/a-1/10*c^2*x*(a^2*x^2+1)^2
*arctan(a*x)^2/a+1/6*c^2*(a^2*x^2+1)^3*arctan(a*x)^3/a^2-8/15*c^2*arctan(a*
x)*ln(2/(1+I*a*x))/a^2-4/15*I*c^2*polylog(2,1-2/(1+I*a*x))/a^2
```

Rubi [A] time = 0.19, antiderivative size = 242, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.400, Rules used = {4930, 4880, 4846, 4920, 4854, 2402, 2315, 8}

$$-\frac{4ic^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{15a^2}-\frac{c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}{10a}-\frac{2c^2x\left(a^2x^2+1\right)\tan^{-1}(ax)^2}{15a}+\frac{c^2\left(a^2x^2+1\right)^3\tan^{-1}(ax}{6a^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] (-11*c^2*x)/(60*a) - (a*c^2*x^3)/60 + (2*c^2*(1 + a^2*x^2)*ArcTan[a*x])/(15
*a^2) + (c^2*(1 + a^2*x^2)^2*ArcTan[a*x])/(20*a^2) - (((4*I)/15)*c^2*ArcTan
[a*x]^2)/a^2 - (4*c^2*x*ArcTan[a*x]^2)/(15*a) - (2*c^2*x*(1 + a^2*x^2)*ArcT
an[a*x]^2)/(15*a) - (c^2*x*(1 + a^2*x^2)^2*ArcTan[a*x]^2)/(10*a) + (c^2*(1
+ a^2*x^2)^3*ArcTan[a*x]^3)/(6*a^2) - (8*c^2*ArcTan[a*x]*Log[2/(1 + I*a*x)]
)/(15*a^2) - (((4*I)/15)*c^2*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3\,dx=\frac{c^2\left(1+a^2x^2\right)^3\tan^{-1}(ax)^3}{6a^2}-\frac{\int\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2\,dx}{2a}$$
$$=\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{20a^2}-\frac{c^2x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}{10a}+\frac{c^2\left(1+a^2x^2\right)^3\tan^{-1}(a$$
$$=-\frac{c^2x}{20a}-\frac{1}{60}ac^2x^3+\frac{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a^2}+\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{20a^2}-\frac{2c^2x$$
$$=-\frac{11c^2x}{60a}-\frac{1}{60}ac^2x^3+\frac{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a^2}+\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{20a^2}-\frac{4c^2$$
$$=-\frac{11c^2x}{60a}-\frac{1}{60}ac^2x^3+\frac{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a^2}+\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{20a^2}-\frac{4ic$$
$$=-\frac{11c^2x}{60a}-\frac{1}{60}ac^2x^3+\frac{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a^2}+\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{20a^2}-\frac{4ic$$
$$=-\frac{11c^2x}{60a}-\frac{1}{60}ac^2x^3+\frac{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a^2}+\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{20a^2}-\frac{4ic$$
$$=-\frac{11c^2x}{60a}-\frac{1}{60}ac^2x^3+\frac{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}{15a^2}+\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{20a^2}-\frac{4ic$$

Mathematica [A] time = 0.79, size = 131, normalized size = 0.54

$$\frac{c^2\left(-ax\left(a^2x^2+11\right)+10\left(a^2x^2+1\right)^3\tan^{-1}(ax)^3-2\left(3a^5x^5+10a^3x^3+15ax-8i\right)\tan^{-1}(ax)^2+\tan^{-1}(ax)\left(3a^4x^4\right.}{60a^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] (c^2*(-(a*x*(11 + a^2*x^2)) - 2*(-8*I + 15*a*x + 10*a^3*x^3 + 3*a^5*x^5)*Ar
cTan[a*x]^2 + 10*(1 + a^2*x^2)^3*ArcTan[a*x]^3 + ArcTan[a*x]*(11 + 14*a^2*x
^2 + 3*a^4*x^4 - 32*Log[1 + E^((2*I)*ArcTan[a*x])]) + (16*I)*PolyLog[2, -E^
((2*I)*ArcTan[a*x])]))/(60*a^2)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(a^4c^2x^5 + 2\,a^2c^2x^3 + c^2x\right)\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.12, size = 368, normalized size = 1.52

$$\frac{a^4c^2\arctan\left(ax\right)^3x^6}{6}+\frac{a^2c^2\arctan\left(ax\right)^3x^4}{2}+\frac{c^2\arctan\left(ax\right)^3x^2}{2}-\frac{a^3c^2\arctan\left(ax\right)^2x^5}{10}-\frac{a\,c^2\arctan\left(ax\right)^2x^3}{3}-\frac{c^2x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^3,x)
```

```
[Out] 1/6*a^4*c^2*arctan(a*x)^3*x^6+1/2*a^2*c^2*arctan(a*x)^3*x^4+1/2*c^2*arctan(
a*x)^3*x^2-1/10*a^3*c^2*arctan(a*x)^2*x^5-1/3*a*c^2*arctan(a*x)^2*x^3-1/2*c
^2*x*arctan(a*x)^2/a+1/6/a^2*c^2*arctan(a*x)^3+1/20*a^2*c^2*arctan(a*x)*x^4
+7/30*c^2*arctan(a*x)*x^2+4/15/a^2*c^2*arctan(a*x)*ln(a^2*x^2+1)-1/60*a*c^2
*x^3-11/60*c^2*x/a+11/60/a^2*c^2*arctan(a*x)+2/15*I/a^2*c^2*ln(a*x-I)*ln(a^
2*x^2+1)+1/15*I/a^2*c^2*ln(I+a*x)^2-2/15*I/a^2*c^2*dilog(-1/2*I*(I+a*x))-1/
15*I/a^2*c^2*ln(a*x-I)^2+2/15*I/a^2*c^2*dilog(1/2*I*(a*x-I))-2/15*I/a^2*c^2
*ln(I+a*x)*ln(a^2*x^2+1)-2/15*I/a^2*c^2*ln(a*x-I)*ln(-1/2*I*(I+a*x))+2/15*I
/a^2*c^2*ln(I+a*x)*ln(1/2*I*(a*x-I))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^3*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x*atan(a*x)^3*(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x\operatorname{atan}^3(ax)\,dx+\int 2a^2x^3\operatorname{atan}^3(ax)\,dx+\int a^4x^5\operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2*atan(a*x)**3,x)
```

```
[Out] c**2*(Integral(x*atan(a*x)**3, x) + Integral(2*a**2*x**3*atan(a*x)**3, x) +
 Integral(a**4*x**5*atan(a*x)**3, x))
```

3.374 $\int \left(c + a^2cx^2\right)^2 \tan^{-1}(ax)^3\, dx$

Optimal. Leaf size=289

$$-\frac{c^2\left(a^2x^2+1\right)}{20a}-\frac{c^2\log\left(a^2x^2+1\right)}{2a}+\frac{1}{5}c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^3+\frac{4}{15}c^2x\left(a^2x^2+1\right)\tan^{-1}(ax)^3-\frac{3c^2\left(a^2x^2+1\right)^2}{20a}$$

```
[Out] -1/20*c^2*(a^2*x^2+1)/a+c^2*x*arctan(a*x)+1/10*c^2*x*(a^2*x^2+1)*arctan(a*x
)-2/5*c^2*(a^2*x^2+1)*arctan(a*x)^2/a-3/20*c^2*(a^2*x^2+1)^2*arctan(a*x)^2/
a+8/15*I*c^2*arctan(a*x)^3/a+8/15*c^2*x*arctan(a*x)^3+4/15*c^2*x*(a^2*x^2+1
)*arctan(a*x)^3+1/5*c^2*x*(a^2*x^2+1)^2*arctan(a*x)^3+8/5*c^2*arctan(a*x)^2
*ln(2/(1+I*a*x))/a-1/2*c^2*ln(a^2*x^2+1)/a+8/5*I*c^2*arctan(a*x)*polylog(2,
1-2/(1+I*a*x))/a+4/5*c^2*polylog(3,1-2/(1+I*a*x))/a
```

Rubi [A] time = 0.25, antiderivative size = 289, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 9, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.474, Rules used = {4880, 4846, 4920, 4854, 4884, 4994, 6610, 260, 4878}

$$\frac{4c^2\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{5a}+\frac{8ic^2\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{5a}-\frac{c^2\left(a^2x^2+1\right)}{20a}-\frac{c^2\log\left(a^2x^2+1\right)}{2a}+\frac{1}{5}c^2x\left(a^2x\right.$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] -(c^2*(1 + a^2*x^2))/(20*a) + c^2*x*ArcTan[a*x] + (c^2*x*(1 + a^2*x^2)*ArcT
an[a*x])/10 - (2*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2)/(5*a) - (3*c^2*(1 + a^2*x
^2)^2*ArcTan[a*x]^2)/(20*a) + (((8*I)/15)*c^2*ArcTan[a*x]^3)/a + (8*c^2*x*A
rcTan[a*x]^3)/15 + (4*c^2*x*(1 + a^2*x^2)*ArcTan[a*x]^3)/15 + (c^2*x*(1 + a
^2*x^2)^2*ArcTan[a*x]^3)/5 + (8*c^2*ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/(5*a)
 - (c^2*Log[1 + a^2*x^2])/(2*a) + (((8*I)/5)*c^2*ArcTan[a*x]*PolyLog[2, 1 -
 2/(1 + I*a*x)])/a + (4*c^2*PolyLog[3, 1 - 2/(1 + I*a*x)])/(5*a)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3\,dx = -\frac{3c^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2}{20a} + \frac{1}{5}c^2x\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^3 + \frac{1}{10}(3c)\int \left(c+a^2cx\right.$$

$$= -\frac{c^2\left(1+a^2x^2\right)}{20a} + \frac{1}{10}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax) - \frac{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}{5a} - \frac{3c^2\left(\right.}{}$$

$$= -\frac{c^2\left(1+a^2x^2\right)}{20a} + c^2x\tan^{-1}(ax) + \frac{1}{10}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax) - \frac{2c^2\left(1+a^2x^2\right)\tan}{5a}$$

$$= -\frac{c^2\left(1+a^2x^2\right)}{20a} + c^2x\tan^{-1}(ax) + \frac{1}{10}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax) - \frac{2c^2\left(1+a^2x^2\right)\tan}{5a}$$

$$= -\frac{c^2\left(1+a^2x^2\right)}{20a} + c^2x\tan^{-1}(ax) + \frac{1}{10}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax) - \frac{2c^2\left(1+a^2x^2\right)\tan}{5a}$$

$$= -\frac{c^2\left(1+a^2x^2\right)}{20a} + c^2x\tan^{-1}(ax) + \frac{1}{10}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax) - \frac{2c^2\left(1+a^2x^2\right)\tan}{5a}$$

$$= -\frac{c^2\left(1+a^2x^2\right)}{20a} + c^2x\tan^{-1}(ax) + \frac{1}{10}c^2x\left(1+a^2x^2\right)\tan^{-1}(ax) - \frac{2c^2\left(1+a^2x^2\right)\tan}{5a}$$

Mathematica [A] time = 0.60, size = 195, normalized size = 0.67

$$\frac{c^2\left(12a^5x^5\tan^{-1}(ax)^3-9a^4x^4\tan^{-1}(ax)^2+40a^3x^3\tan^{-1}(ax)^3+6a^3x^3\tan^{-1}(ax)-3a^2x^2-30\log\left(a^2x^2+1\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
```

```
[Out] (c^2*(-3 - 3*a^2*x^2 + 66*a*x*ArcTan[a*x] + 6*a^3*x^3*ArcTan[a*x] - 33*ArcT
an[a*x]^2 - 42*a^2*x^2*ArcTan[a*x]^2 - 9*a^4*x^4*ArcTan[a*x]^2 - (32*I)*Arc
Tan[a*x]^3 + 60*a*x*ArcTan[a*x]^3 + 40*a^3*x^3*ArcTan[a*x]^3 + 12*a^5*x^5*A
rcTan[a*x]^3 + 96*ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] - 30*Log[1 +
 a^2*x^2] - (96*I)*ArcTan[a*x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + 48*Poly
Log[3, -E^((2*I)*ArcTan[a*x])]))/(60*a)
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 5.53, size = 2691, normalized size = 9.31

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^3,x)
```

```
[Out] 11/10*c^2*x*arctan(a*x)+c^2*x*arctan(a*x)^3-3/20*I*a*c^2*Pi*csgn(I*((1+I*a*
x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2*x^2+4/5*I/a*c^2*Pi*csgn(I*(1+I*a*x)^
2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2+2/5*I/a*
c^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I
*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2-1/20*a^2*c^2*Pi*csgn(I*((1+I*a*x)
^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2*x^
3+1/10*a^2*c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(
a^2*x^2+1)+1)^2)^2*arctan(a*x)^2*x^3+1/20*a^2*c^2*Pi*csgn(I*(1+I*a*x)^2/(a^
2*x^2+1)+I)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+
I)*arctan(a*x)^2*x^3-1/10*a^2*c^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn
(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*arctan(a*x)^2
*x^3-11/20/a*c^2*arctan(a*x)^2+1/a*c^2*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+4/5/a*
c^2*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-1/20*a^2*c^2*Pi*csgn(I*((1+I*a*x)^2
/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2*x^3+1/20*a^2*c^2*Pi*csgn(I*(1+I*a*x)^4/(
a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^3*arctan(a*x)^2*x^3+3/20*c^2*Pi
*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2
)*arctan(a*x)^2*x-3/10*c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((
1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2*x-3/20*c^2*Pi*csgn(I*(1+I*a*x)
^2/(a^2*x^2+1)+I)^2*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x
```

```
^2+1)+I)*arctan(a*x)^2*x+3/10*c^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn
(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*arctan(a*x)^2
*x+1/20*I/a*c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2-2/
5*I/a*c^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*arctan(a*x)^2-2/5*I/a*c^2*Pi
*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x
)^2+7/20*I/a*c^2*Pi*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x
^2+1)+I)^3*arctan(a*x)^2+3/20*I*a*c^2*Pi*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2
*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^3*arctan(a*x)^2*x^2-2/5*I/a*c^2*Pi*csgn(I*(1+
I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*arctan(a*x)^2+2
/5*I/a*c^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)
^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2-7/10*I/a*c^2*Pi*csgn
(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*csgn(I*(1+I*a
*x)^2/(a^2*x^2+1)+I)*arctan(a*x)^2+7/20*I/a*c^2*Pi*csgn(I*(1+I*a*x)^4/(a^2*
x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2
*arctan(a*x)^2+1/20*I/a*c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I
*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2-1/10*I/a*c^2*Pi*csgn(I*((1+I*
a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^
2+1/10*a^2*c^2*arctan(a*x)*x^3-3/20*a^3*c^2*arctan(a*x)^2*x^4-7/10*a*c^2*ar
ctan(a*x)^2*x^2+1/5*a^4*c^2*arctan(a*x)^3*x^5+2/3*a^2*c^2*arctan(a*x)^3*x^3
-4/5/a*c^2*arctan(a*x)^2*ln(a^2*x^2+1)+8/5/a*c^2*arctan(a*x)^2*ln((1+I*a*x)
/(a^2*x^2+1)^(1/2))+8/5/a*c^2*ln(2)*arctan(a*x)^2-8/15*I/a*c^2*arctan(a*x)^
3-I/a*c^2*arctan(a*x)-3/20*c^2*Pi*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I
*a*x)^2/(a^2*x^2+1)+I)^3*arctan(a*x)^2*x+3/20*c^2*Pi*csgn(I*((1+I*a*x)^2/(a
^2*x^2+1)+1)^2)^3*arctan(a*x)^2*x-8/5*I/a*c^2*arctan(a*x)*polylog(2,-(1+I*a
*x)^2/(a^2*x^2+1))-1/20/a*c^2-1/20*c^2*x^2*a-2/5*I/a*c^2*Pi*csgn(I*(1+I*a*x
)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2-3/20*I*a*c^2*Pi*csg
n(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*ar
ctan(a*x)^2*x^2+3/10*I*a*c^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*
((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2*x^2-3/10*I*a*c^2*Pi*csgn(I*(
1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*csgn(I*(1+I*a*x)^
2/(a^2*x^2+1)+I)*arctan(a*x)^2*x^2+3/20*I*a*c^2*Pi*csgn(I*(1+I*a*x)^4/(a^2*
x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2
*arctan(a*x)^2*x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$140\,a^6c^2\int \frac{x^6\arctan(ax)^3}{160\left(a^2x^2+1\right)}\,dx+15\,a^6c^2\int \frac{x^6\arctan(ax)\log\left(a^2x^2+1\right)^2}{160\left(a^2x^2+1\right)}\,dx+12\,a^6c^2\int \frac{x^6\arctan(ax)\log\left(a^2x^2+\right.}{160\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 140*a^6*c^2*integrate(1/160*x^6*arctan(a*x)^3/(a^2*x^2 + 1), x) + 15*a^6*c^
2*integrate(1/160*x^6*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 12
*a^6*c^2*integrate(1/160*x^6*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x)
 - 12*a^5*c^2*integrate(1/160*x^5*arctan(a*x)^2/(a^2*x^2 + 1), x) + 3*a^5*c
^2*integrate(1/160*x^5*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 420*a^4*c^2*i
ntegrate(1/160*x^4*arctan(a*x)^3/(a^2*x^2 + 1), x) + 45*a^4*c^2*integrate(1
/160*x^4*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 40*a^4*c^2*inte
grate(1/160*x^4*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) - 40*a^3*c^2
*integrate(1/160*x^3*arctan(a*x)^2/(a^2*x^2 + 1), x) + 10*a^3*c^2*integrate
(1/160*x^3*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 7/32*c^2*arctan(a*x)^4/a
+ 420*a^2*c^2*integrate(1/160*x^2*arctan(a*x)^3/(a^2*x^2 + 1), x) + 45*a^2*
c^2*integrate(1/160*x^2*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) +
60*a^2*c^2*integrate(1/160*x^2*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*x^2 + 1),
x) + 1/120*(3*a^4*c^2*x^5 + 10*a^2*c^2*x^3 + 15*c^2*x)*arctan(a*x)^3 - 60*a
*c^2*integrate(1/160*x*arctan(a*x)^2/(a^2*x^2 + 1), x) + 15*a*c^2*integrate
(1/160*x*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) - 1/160*(3*a^4*c^2*x^5 + 10*a
```

```
^2*c^2*x^3 + 15*c^2*x)*arctan(a*x)*log(a^2*x^2 + 1)^2 + 15*c^2*integrate(1/
160*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(atan(a*x)^3*(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int 2a^{2}x^{2}\operatorname{atan}^{3}{\left(ax\right)}\,dx + \int a^{4}x^{4}\operatorname{atan}^{3}{\left(ax\right)}\,dx + \int \operatorname{atan}^{3}{\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**3,x)
```

```
[Out] c**2*(Integral(2*a**2*x**2*atan(a*x)**3, x) + Integral(a**4*x**4*atan(a*x)*
*3, x) + Integral(atan(a*x)**3, x))
```

3.375 $\int \frac{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}{x}\,dx$

Optimal. Leaf size=370

$$\frac{1}{4}a^4c^2x^4\tan^{-1}(ax)^3-\frac{1}{4}a^3c^2x^3\tan^{-1}(ax)^2+a^2c^2x^2\tan^{-1}(ax)^3+\frac{1}{4}a^2c^2x^2\tan^{-1}(ax)-2ic^2\mathrm{Li}_2\left(1-\frac{2}{iax+1}\right)+\frac{3}{4}ic^2\mathrm{Li}_4\left(\right.$$

```
[Out] -1/4*a*c^2*x+1/4*c^2*arctan(a*x)+1/4*a^2*c^2*x^2*arctan(a*x)-3/4*I*c^2*poly
log(4,-1+2/(1+I*a*x))-9/4*a*c^2*x*arctan(a*x)^2-1/4*a^3*c^2*x^3*arctan(a*x)
^2+3/4*c^2*arctan(a*x)^3+a^2*c^2*x^2*arctan(a*x)^3+1/4*a^4*c^2*x^4*arctan(a
*x)^3-2*c^2*arctan(a*x)^3*arctanh(-1+2/(1+I*a*x))-4*c^2*arctan(a*x)*ln(2/(1
+I*a*x))-2*I*c^2*polylog(2,1-2/(1+I*a*x))-2*I*c^2*arctan(a*x)^2-3/2*I*c^2*a
rctan(a*x)^2*polylog(2,1-2/(1+I*a*x))-3/2*c^2*arctan(a*x)*polylog(3,1-2/(1+
I*a*x))+3/2*c^2*arctan(a*x)*polylog(3,-1+2/(1+I*a*x))+3/2*I*c^2*arctan(a*x)
^2*polylog(2,-1+2/(1+I*a*x))+3/4*I*c^2*polylog(4,1-2/(1+I*a*x))
```

Rubi [A] time = 0.97, antiderivative size = 370, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 16, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727, Rules used = {4948, 4850, 4988, 4884, 4994, 4998, 6610, 4852, 4916, 4846, 4920, 4854, 2402, 2315, 321, 203}

$$-2ic^2\mathrm{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{3}{4}ic^2\mathrm{PolyLog}\left(4,1-\frac{2}{1+iax}\right)-\frac{3}{4}ic^2\mathrm{PolyLog}\left(4,-1+\frac{2}{1+iax}\right)-\frac{3}{2}ic^2\tan^{-1}(ax)^2\mathrm{I}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x,x]
```

```
[Out] -(a*c^2*x)/4 + (c^2*ArcTan[a*x])/4 + (a^2*c^2*x^2*ArcTan[a*x])/4 - (2*I)*c^
2*ArcTan[a*x]^2 - (9*a*c^2*x*ArcTan[a*x]^2)/4 - (a^3*c^2*x^3*ArcTan[a*x]^2)
/4 + (3*c^2*ArcTan[a*x]^3)/4 + a^2*c^2*x^2*ArcTan[a*x]^3 + (a^4*c^2*x^4*Arc
Tan[a*x]^3)/4 + 2*c^2*ArcTan[a*x]^3*ArcTanh[1 - 2/(1 + I*a*x)] - 4*c^2*ArcT
an[a*x]*Log[2/(1 + I*a*x)] - (2*I)*c^2*PolyLog[2, 1 - 2/(1 + I*a*x)] - ((3*
I)/2)*c^2*ArcTan[a*x]^2*PolyLog[2, 1 - 2/(1 + I*a*x)] + ((3*I)/2)*c^2*ArcTa
n[a*x]^2*PolyLog[2, -1 + 2/(1 + I*a*x)] - (3*c^2*ArcTan[a*x]*PolyLog[3, 1 -
 2/(1 + I*a*x)])/2 + (3*c^2*ArcTan[a*x]*PolyLog[3, -1 + 2/(1 + I*a*x)])/2 +
 ((3*I)/4)*c^2*PolyLog[4, 1 - 2/(1 + I*a*x)] - ((3*I)/4)*c^2*PolyLog[4, -1
+ 2/(1 + I*a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^3}{x}\,dx = \int \left(\frac{c^2\tan^{-1}(ax)^3}{x} + 2a^2c^2x\tan^{-1}(ax)^3 + a^4c^2x^3\tan^{-1}(ax)^3\right)dx$$

$$= c^2\int \frac{\tan^{-1}(ax)^3}{x}\,dx + (2a^2c^2)\int x\tan^{-1}(ax)^3\,dx + (a^4c^2)\int x^3\tan^{-1}(ax)^3\,dx$$

$$= a^2c^2x^2\tan^{-1}(ax)^3 + \frac{1}{4}a^4c^2x^4\tan^{-1}(ax)^3 + 2c^2\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right.$$

$$= a^2c^2x^2\tan^{-1}(ax)^3 + \frac{1}{4}a^4c^2x^4\tan^{-1}(ax)^3 + 2c^2\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right.$$

$$= -3ac^2x\tan^{-1}(ax)^2 - \frac{1}{4}a^3c^2x^3\tan^{-1}(ax)^2 + c^2\tan^{-1}(ax)^3 + a^2c^2x^2\tan^{-1}(ax)^3$$

$$= -3ic^2\tan^{-1}(ax)^2 - \frac{9}{4}ac^2x\tan^{-1}(ax)^2 - \frac{1}{4}a^3c^2x^3\tan^{-1}(ax)^2 + \frac{3}{4}c^2\tan^{-1}(ax)^3$$

$$= \frac{1}{4}a^2c^2x^2\tan^{-1}(ax) - 2ic^2\tan^{-1}(ax)^2 - \frac{9}{4}ac^2x\tan^{-1}(ax)^2 - \frac{1}{4}a^3c^2x^3\tan^{-1}(ax)$$

$$= -\frac{1}{4}ac^2x + \frac{1}{4}a^2c^2x^2\tan^{-1}(ax) - 2ic^2\tan^{-1}(ax)^2 - \frac{9}{4}ac^2x\tan^{-1}(ax)^2 - \frac{1}{4}a^3c^2x^3$$

$$= -\frac{1}{4}ac^2x + \frac{1}{4}c^2\tan^{-1}(ax) + \frac{1}{4}a^2c^2x^2\tan^{-1}(ax) - 2ic^2\tan^{-1}(ax)^2 - \frac{9}{4}ac^2x\tan^{-}$$

$$= -\frac{1}{4}ac^2x + \frac{1}{4}c^2\tan^{-1}(ax) + \frac{1}{4}a^2c^2x^2\tan^{-1}(ax) - 2ic^2\tan^{-1}(ax)^2 - \frac{9}{4}ac^2x\tan^{-}$$

Mathematica [A] time = 0.58, size = 302, normalized size = 0.82

$$\frac{1}{64}c^2\left(16a^4x^4\tan^{-1}(ax)^3 - 16a^3x^3\tan^{-1}(ax)^2 + 64a^2x^2\tan^{-1}(ax)^3 + 16a^2x^2\tan^{-1}(ax) + 96i\tan^{-1}(ax)^2\mathrm{Li}_2\left(e^{-}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x,x]
```

```
[Out] (c^2*((-I)*Pi^4 - 16*a*x + 16*ArcTan[a*x] + 16*a^2*x^2*ArcTan[a*x] + (128*I
)*ArcTan[a*x]^2 - 144*a*x*ArcTan[a*x]^2 - 16*a^3*x^3*ArcTan[a*x]^2 + 48*Arc
Tan[a*x]^3 + 64*a^2*x^2*ArcTan[a*x]^3 + 16*a^4*x^4*ArcTan[a*x]^3 + (32*I)*A
rcTan[a*x]^4 + 64*ArcTan[a*x]^3*Log[1 - E^((-2*I)*ArcTan[a*x])] - 256*ArcTa
n[a*x]*Log[1 + E^((2*I)*ArcTan[a*x])] - 64*ArcTan[a*x]^3*Log[1 + E^((2*I)*A
rcTan[a*x])] + (96*I)*ArcTan[a*x]^2*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + (3
2*I)*(4 + 3*ArcTan[a*x]^2)*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + 96*ArcTan[a
*x]*PolyLog[3, E^((-2*I)*ArcTan[a*x])] - 96*ArcTan[a*x]*PolyLog[3, -E^((2*I
)*ArcTan[a*x])] - (48*I)*PolyLog[4, E^((-2*I)*ArcTan[a*x])] - (48*I)*PolyLo
g[4, -E^((2*I)*ArcTan[a*x])]))/64
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2)\arctan(ax)^3}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^3/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 11.19, size = 566, normalized size = 1.53

$$\frac{c^2\left(-3i\arctan(ax)^3+3\arctan(ax)^3ax-i\arctan(ax)^3a^2x^2+\arctan(ax)^3a^3x^3-8\arctan(ax)^2+i\arctan(ax)^2\right.}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^3/x,x)
```

```
[Out] 1/4*c^2*(-3*I*arctan(a*x)^3+3*arctan(a*x)^3*a*x-I*arctan(a*x)^3*a^2*x^2+arc
tan(a*x)^3*a^3*x^3-8*arctan(a*x)^2+I*arctan(a*x)^2*a*x-arctan(a*x)^2*x^2*a^
2-I*arctan(a*x)+arctan(a*x)*x*a-1)*(I+a*x)-3/4*I*c^2*polylog(4,-(1+I*a*x)^2
/(a^2*x^2+1))-4*c^2*arctan(a*x)*ln((1+I*a*x)^2/(a^2*x^2+1)+1)-3*I*c^2*arcta
n(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*c^2*polylog(2,-(1+I*a*
x)^2/(a^2*x^2+1))+4*I*c^2*arctan(a*x)^2+6*I*c^2*polylog(4,(1+I*a*x)/(a^2*x^
2+1)^(1/2))-c^2*arctan(a*x)^3*ln((1+I*a*x)^2/(a^2*x^2+1)+1)-3*I*c^2*arctan(
a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-3/2*c^2*arctan(a*x)*polylog(3
,-(1+I*a*x)^2/(a^2*x^2+1))+c^2*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/
2))+6*I*c^2*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*c^2*arctan(a*x)*polyl
og(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+c^2*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2
+1)^(1/2))+3/2*I*c^2*arctan(a*x)^2*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+6*c^
2*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{32}\left(a^4c^2x^4+4\,a^2c^2x^2\right)\arctan(ax)^3-\frac{3}{128}\left(a^4c^2x^4+4\,a^2c^2x^2\right)\arctan(ax)\log\left(a^2x^2+1\right)^2+\int\frac{112\left(a^6c^2x^6+3\,a^4c^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x,x, algorithm="maxima")
```

```
[Out] 1/32*(a^4*c^2*x^4 + 4*a^2*c^2*x^2)*arctan(a*x)^3 - 3/128*(a^4*c^2*x^4 + 4*a
^2*c^2*x^2)*arctan(a*x)*log(a^2*x^2 + 1)^2 + integrate(1/128*(112*(a^6*c^2*
x^6 + 3*a^4*c^2*x^4 + 3*a^2*c^2*x^2 + c^2)*arctan(a*x)^3 - 12*(a^5*c^2*x^5
+ 4*a^3*c^2*x^3)*arctan(a*x)^2 + 12*(a^6*c^2*x^6 + 4*a^4*c^2*x^4)*arctan(a*
x)*log(a^2*x^2 + 1) + 3*(a^5*c^2*x^5 + 4*a^3*c^2*x^3 + 4*(a^6*c^2*x^6 + 3*a
^4*c^2*x^4 + 3*a^2*c^2*x^2 + c^2)*arctan(a*x))*log(a^2*x^2 + 1)^2)/(a^2*x^3
 + x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^2}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int\frac{\operatorname{atan}^{3}\left(ax\right)}{x}\,dx+\int 2a^{2}x\operatorname{atan}^{3}\left(ax\right)dx+\int a^{4}x^{3}\operatorname{atan}^{3}\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**3/x,x)
```

```
[Out] c**2*(Integral(atan(a*x)**3/x, x) + Integral(2*a**2*x*atan(a*x)**3, x) + In
tegral(a**4*x**3*atan(a*x)**3, x))
```

3.376 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^3}{x^2} dx$

Optimal. Leaf size=284

$$\frac{1}{3}a^4c^2x^3\tan^{-1}(ax)^3-\frac{1}{2}a^3c^2x^2\tan^{-1}(ax)^2-\frac{1}{2}ac^2\log\left(a^2x^2+1\right)+2a^2c^2x\tan^{-1}(ax)^3+a^2c^2x\tan^{-1}(ax)+\frac{3}{2}ac^2\mathrm{Li}_3\left(\frac{\ }{1-}\right.$$

```
[Out] a^2*c^2*x*arctan(a*x)-1/2*a*c^2*arctan(a*x)^2-1/2*a^3*c^2*x^2*arctan(a*x)^2
+2/3*I*a*c^2*arctan(a*x)^3-c^2*arctan(a*x)^3/x+2*a^2*c^2*x*arctan(a*x)^3+1/
3*a^4*c^2*x^3*arctan(a*x)^3+5*a*c^2*arctan(a*x)^2*ln(2/(1+I*a*x))-1/2*a*c^2
*ln(a^2*x^2+1)+3*a*c^2*arctan(a*x)^2*ln(2-2/(1-I*a*x))-3*I*a*c^2*arctan(a*x
)*polylog(2,-1+2/(1-I*a*x))+5*I*a*c^2*arctan(a*x)*polylog(2,1-2/(1+I*a*x))+
3/2*a*c^2*polylog(3,-1+2/(1-I*a*x))+5/2*a*c^2*polylog(3,1-2/(1+I*a*x))
```

Rubi [A] time = 0.75, antiderivative size = 284, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 13, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.591, Rules used = {4948, 4846, 4920, 4854, 4884, 4994, 6610, 4852, 4924, 4868, 4992, 4916, 260}

$$\frac{3}{2}ac^2\mathrm{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)+\frac{5}{2}ac^2\mathrm{PolyLog}\left(3,1-\frac{2}{1+iax}\right)-3iac^2\tan^{-1}(ax)\mathrm{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+5iac$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] a^2*c^2*x*ArcTan[a*x] - (a*c^2*ArcTan[a*x]^2)/2 - (a^3*c^2*x^2*ArcTan[a*x]^
2)/2 + ((2*I)/3)*a*c^2*ArcTan[a*x]^3 - (c^2*ArcTan[a*x]^3)/x + 2*a^2*c^2*x*
ArcTan[a*x]^3 + (a^4*c^2*x^3*ArcTan[a*x]^3)/3 + 5*a*c^2*ArcTan[a*x]^2*Log[2
/(1 + I*a*x)] - (a*c^2*Log[1 + a^2*x^2])/2 + 3*a*c^2*ArcTan[a*x]^2*Log[2 -
2/(1 - I*a*x)] - (3*I)*a*c^2*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)] + (
5*I)*a*c^2*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)] + (3*a*c^2*PolyLog[3,
-1 + 2/(1 - I*a*x)])/2 + (5*a*c^2*PolyLog[3, 1 - 2/(1 + I*a*x)])/2
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3}{x^2}\,dx = \int \left(2a^2c^2\tan^{-1}(ax)^3 + \frac{c^2\tan^{-1}(ax)^3}{x^2} + a^4c^2x^2\tan^{-1}(ax)^3\right)dx$$

$$= c^2\int \frac{\tan^{-1}(ax)^3}{x^2}\,dx + \left(2a^2c^2\right)\int \tan^{-1}(ax)^3\,dx + \left(a^4c^2\right)\int x^2\tan^{-1}(ax)^3\,dx$$

$$= -\frac{c^2\tan^{-1}(ax)^3}{x} + 2a^2c^2x\tan^{-1}(ax)^3 + \frac{1}{3}a^4c^2x^3\tan^{-1}(ax)^3 + \left(3ac^2\right)\int \frac{\tan^{-1}(ax}{x\left(1+a^2\right.}$$

$$= iac^2\tan^{-1}(ax)^3 - \frac{c^2\tan^{-1}(ax)^3}{x} + 2a^2c^2x\tan^{-1}(ax)^3 + \frac{1}{3}a^4c^2x^3\tan^{-1}(ax)^3 + \left(3i\right.$$

$$= -\frac{1}{2}a^3c^2x^2\tan^{-1}(ax)^2 + \frac{2}{3}iac^2\tan^{-1}(ax)^3 - \frac{c^2\tan^{-1}(ax)^3}{x} + 2a^2c^2x\tan^{-1}(ax)^3 +$$

$$= -\frac{1}{2}a^3c^2x^2\tan^{-1}(ax)^2 + \frac{2}{3}iac^2\tan^{-1}(ax)^3 - \frac{c^2\tan^{-1}(ax)^3}{x} + 2a^2c^2x\tan^{-1}(ax)^3 +$$

$$= a^2c^2x\tan^{-1}(ax) - \frac{1}{2}ac^2\tan^{-1}(ax)^2 - \frac{1}{2}a^3c^2x^2\tan^{-1}(ax)^2 + \frac{2}{3}iac^2\tan^{-1}(ax)^3 -$$

$$= a^2c^2x\tan^{-1}(ax) - \frac{1}{2}ac^2\tan^{-1}(ax)^2 - \frac{1}{2}a^3c^2x^2\tan^{-1}(ax)^2 + \frac{2}{3}iac^2\tan^{-1}(ax)^3 -$$

Mathematica [A] time = 0.40, size = 246, normalized size = 0.87

$$\frac{c^2\left(8a^4x^4\tan^{-1}(ax)^3 - 12a^3x^3\tan^{-1}(ax)^2 - 12ax\log\left(a^2x^2+1\right) + 48a^2x^2\tan^{-1}(ax)^3 + 24a^2x^2\tan^{-1}(ax) + 72iax\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] (c^2*((-3*I)*a*Pi^3*x + 24*a^2*x^2*ArcTan[a*x] - 12*a*x*ArcTan[a*x]^2 - 12*
a^3*x^3*ArcTan[a*x]^2 - 24*ArcTan[a*x]^3 - (16*I)*a*x*ArcTan[a*x]^3 + 48*a^
2*x^2*ArcTan[a*x]^3 + 8*a^4*x^4*ArcTan[a*x]^3 + 72*a*x*ArcTan[a*x]^2*Log[1
- E^((-2*I)*ArcTan[a*x])] + 120*a*x*ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a
*x])] - 12*a*x*Log[1 + a^2*x^2] + (72*I)*a*x*ArcTan[a*x]*PolyLog[2, E^((-2*
I)*ArcTan[a*x])] - (120*I)*a*x*ArcTan[a*x]*PolyLog[2, -E^((2*I)*ArcTan[a*x]
)] + 36*a*x*PolyLog[3, E^((-2*I)*ArcTan[a*x])] + 60*a*x*PolyLog[3, -E^((2*I
)*ArcTan[a*x])]))/(24*x)
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\arctan\left(ax\right)^3}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^3/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^2,x, algorithm="giac")
[Out] Timed out
```

maple [C] time = 7.84, size = 5486, normalized size = 19.32

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^3/x^2,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3\,\left(c\,a^2\,x^2+c\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x^2,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int 2a^2\operatorname{atan}^3(ax)\,dx+\int \frac{\operatorname{atan}^3(ax)}{x^2}\,dx+\int a^4x^2\operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**3/x**2,x)
[Out] c**2*(Integral(2*a**2*atan(a*x)**3, x) + Integral(atan(a*x)**3/x**2, x) + I
ntegral(a**4*x**2*atan(a*x)**3, x))
```

3.377 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^3}{x^3} dx$

Optimal. Leaf size=399

$$\frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^3-\frac{3}{2}a^3c^2x\tan^{-1}(ax)^2-\frac{3}{2}ia^2c^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)-\frac{3}{2}ia^2c^2\text{Li}_2\left(1-\frac{2}{iax+1}\right)+\frac{3}{2}ia^2c^2\text{Li}_4\left(1-\frac{2}{iax+\right.$$

```
[Out] 3/2*I*a^2*c^2*polylog(4,1-2/(1+I*a*x))-3/2*a*c^2*arctan(a*x)^2/x-3/2*a^3*c^
2*x*arctan(a*x)^2-1/2*c^2*arctan(a*x)^3/x^2+1/2*a^4*c^2*x^2*arctan(a*x)^3-4
*a^2*c^2*arctan(a*x)^3*arctanh(-1+2/(1+I*a*x))-3*a^2*c^2*arctan(a*x)*ln(2/(
1+I*a*x))+3*a^2*c^2*arctan(a*x)*ln(2-2/(1-I*a*x))-3/2*I*a^2*c^2*polylog(2,1
-2/(1+I*a*x))-3/2*I*a^2*c^2*polylog(4,-1+2/(1+I*a*x))-3*I*a^2*c^2*arctan(a*
x)^2+3*I*a^2*c^2*arctan(a*x)^2*polylog(2,-1+2/(1+I*a*x))-3*a^2*c^2*arctan(a
*x)*polylog(3,1-2/(1+I*a*x))+3*a^2*c^2*arctan(a*x)*polylog(3,-1+2/(1+I*a*x)
)-3*I*a^2*c^2*arctan(a*x)^2*polylog(2,1-2/(1+I*a*x))-3/2*I*a^2*c^2*polylog(
2,-1+2/(1-I*a*x))
```

Rubi [A] time = 0.80, antiderivative size = 399, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 18, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.818, Rules used = {4948, 4852, 4918, 4924, 4868, 2447, 4884, 4850, 4988, 4994, 4998, 6610, 4916, 4846, 4920, 4854, 2402, 2315}

$$-\frac{3}{2}ia^2c^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{3}{2}ia^2c^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{3}{2}ia^2c^2\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)-\frac{3}{2}ia^2c^2\text{Po}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (-3*I)*a^2*c^2*ArcTan[a*x]^2 - (3*a*c^2*ArcTan[a*x]^2)/(2*x) - (3*a^3*c^2*x
*ArcTan[a*x]^2)/2 - (c^2*ArcTan[a*x]^3)/(2*x^2) + (a^4*c^2*x^2*ArcTan[a*x]^
3)/2 + 4*a^2*c^2*ArcTan[a*x]^3*ArcTanh[1 - 2/(1 + I*a*x)] - 3*a^2*c^2*ArcTa
n[a*x]*Log[2/(1 + I*a*x)] + 3*a^2*c^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)] -
((3*I)/2)*a^2*c^2*PolyLog[2, -1 + 2/(1 - I*a*x)] - ((3*I)/2)*a^2*c^2*PolyLo
g[2, 1 - 2/(1 + I*a*x)] - (3*I)*a^2*c^2*ArcTan[a*x]^2*PolyLog[2, 1 - 2/(1 +
 I*a*x)] + (3*I)*a^2*c^2*ArcTan[a*x]^2*PolyLog[2, -1 + 2/(1 + I*a*x)] - 3*a
^2*c^2*ArcTan[a*x]*PolyLog[3, 1 - 2/(1 + I*a*x)] + 3*a^2*c^2*ArcTan[a*x]*Po
lyLog[3, -1 + 2/(1 + I*a*x)] + ((3*I)/2)*a^2*c^2*PolyLog[4, 1 - 2/(1 + I*a*
x)] - ((3*I)/2)*a^2*c^2*PolyLog[4, -1 + 2/(1 + I*a*x)]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3}{x^3}\,dx = \int \left(\frac{c^2\tan^{-1}(ax)^3}{x^3} + \frac{2a^2c^2\tan^{-1}(ax)^3}{x} + a^4c^2x\tan^{-1}(ax)^3\right)dx$$

$$= c^2\int \frac{\tan^{-1}(ax)^3}{x^3}\,dx + \left(2a^2c^2\right)\int \frac{\tan^{-1}(ax)^3}{x}\,dx + \left(a^4c^2\right)\int x\tan^{-1}(ax)^3\,dx$$

$$= -\frac{c^2\tan^{-1}(ax)^3}{2x^2} + \frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^3 + 4a^2c^2\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right.$$

$$= -\frac{c^2\tan^{-1}(ax)^3}{2x^2} + \frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^3 + 4a^2c^2\tan^{-1}(ax)^3\tanh^{-1}\left(1-\frac{2}{1+iax}\right.$$

$$= -\frac{3ac^2\tan^{-1}(ax)^2}{2x} - \frac{3}{2}a^3c^2x\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^3}{2x^2} + \frac{1}{2}a^4c^2x^2\tan^{-1}(ax)^3$$

$$= -3ia^2c^2\tan^{-1}(ax)^2 - \frac{3ac^2\tan^{-1}(ax)^2}{2x} - \frac{3}{2}a^3c^2x\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^3}{2x^2} +$$

$$= -3ia^2c^2\tan^{-1}(ax)^2 - \frac{3ac^2\tan^{-1}(ax)^2}{2x} - \frac{3}{2}a^3c^2x\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^3}{2x^2} +$$

$$= -3ia^2c^2\tan^{-1}(ax)^2 - \frac{3ac^2\tan^{-1}(ax)^2}{2x} - \frac{3}{2}a^3c^2x\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^3}{2x^2} +$$

$$= -3ia^2c^2\tan^{-1}(ax)^2 - \frac{3ac^2\tan^{-1}(ax)^2}{2x} - \frac{3}{2}a^3c^2x\tan^{-1}(ax)^2 - \frac{c^2\tan^{-1}(ax)^3}{2x^2} +$$

Mathematica [A] time = 0.61, size = 302, normalized size = 0.76

$$\frac{1}{32}a^2c^2\left(16a^2x^2\tan^{-1}(ax)^3 - \frac{16\tan^{-1}(ax)^3}{a^2x^2} + 96i\tan^{-1}(ax)^2\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) + 96\tan^{-1}(ax)\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (a^2*c^2*((-I)*Pi^4 - (48*ArcTan[a*x]^2)/(a*x) - 48*a*x*ArcTan[a*x]^2 - (16
*ArcTan[a*x]^3)/(a^2*x^2) + 16*a^2*x^2*ArcTan[a*x]^3 + (32*I)*ArcTan[a*x]^4
 + 64*ArcTan[a*x]^3*Log[1 - E^((-2*I)*ArcTan[a*x])] + 96*ArcTan[a*x]*Log[1
- E^((2*I)*ArcTan[a*x])] - 96*ArcTan[a*x]*Log[1 + E^((2*I)*ArcTan[a*x])] -
64*ArcTan[a*x]^3*Log[1 + E^((2*I)*ArcTan[a*x])] + (96*I)*ArcTan[a*x]^2*Poly
Log[2, E^((-2*I)*ArcTan[a*x])] + (48*I)*(1 + 2*ArcTan[a*x]^2)*PolyLog[2, -E
^((2*I)*ArcTan[a*x])] - (48*I)*PolyLog[2, E^((2*I)*ArcTan[a*x])] + 96*ArcTa
n[a*x]*PolyLog[3, E^((-2*I)*ArcTan[a*x])] - 96*ArcTan[a*x]*PolyLog[3, -E^((
2*I)*ArcTan[a*x])] - (48*I)*PolyLog[4, E^((-2*I)*ArcTan[a*x])] - (48*I)*Pol
yLog[4, -E^((2*I)*ArcTan[a*x])]))/32
```

fricas [F] time = 0.84, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\arctan(ax)^3}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^3/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 10.27, size = 682, normalized size = 1.71

$$\frac{a^4c^2x^2\arctan(ax)^3}{2}-\frac{3a^3c^2x\arctan(ax)^2}{2}-\frac{3a\,c^2\arctan(ax)^2}{2x}-\frac{c^2\arctan(ax)^3}{2x^2}+2a^2c^2\arctan(ax)^3\ln\left(1-\frac{iax+}{\sqrt{a^2x^2}}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^3/x^3,x)
```

```
[Out] 1/2*a^4*c^2*x^2*arctan(a*x)^3-3/2*a^3*c^2*x*arctan(a*x)^2-3/2*a*c^2*arctan(
a*x)^2/x-1/2*c^2*arctan(a*x)^3/x^2+2*a^2*c^2*arctan(a*x)^3*ln(1-(1+I*a*x)/(
a^2*x^2+1)^(1/2))+12*I*a^2*c^2*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+12*a
^2*c^2*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+12*I*a^2*c^2*poly
log(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*a^2*c^2*arctan(a*x)*ln((1+I*a*x)^2/(a^
2*x^2+1)+1)-3*I*a^2*c^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*a^2*c^2*a
rctan(a*x)*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-6*I*a^2*c^2*arctan(a*x)^2*po
lylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2*c^2*arctan(a*x)*ln(1+(1+I*a*x)/
(a^2*x^2+1)^(1/2))+3*I*a^2*c^2*arctan(a*x)^2*polylog(2,-(1+I*a*x)^2/(a^2*x^
2+1))-2*a^2*c^2*arctan(a*x)^3*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+3/2*I*a^2*c^2*p
olylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+2*a^2*c^2*arctan(a*x)^3*ln(1+(1+I*a*x)/(
a^2*x^2+1)^(1/2))-3/2*I*a^2*c^2*polylog(4,-(1+I*a*x)^2/(a^2*x^2+1))+3*a^2*c
^2*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*a^2*c^2*arctan(a*x)^2*
polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+12*a^2*c^2*arctan(a*x)*polylog(3,-(1
+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*a^2*c^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2
))
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x^3,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int \frac{\operatorname{atan}^3(ax)}{x^3}\,dx+\int \frac{2a^2\operatorname{atan}^3(ax)}{x}\,dx+\int a^4x\operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**3/x**3,x)
```

```
[Out] c**2*(Integral(atan(a*x)**3/x**3, x) + Integral(2*a**2*atan(a*x)**3/x, x) +
 Integral(a**4*x*atan(a*x)**3, x))
```

3.378 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^3}{x^4} dx$

Optimal. Leaf size=311

$$a^4c^2x\tan^{-1}(ax)^3+\frac{5}{2}a^3c^2\text{Li}_3\left(\frac{2}{1-iax}-1\right)+\frac{3}{2}a^3c^2\text{Li}_3\left(1-\frac{2}{iax+1}\right)-5ia^3c^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)+3ia^3c^2\text{Li}_2\left(\right.$$

```
[Out] -a^2*c^2*arctan(a*x)/x-1/2*a^3*c^2*arctan(a*x)^2-1/2*a*c^2*arctan(a*x)^2/x^
2-2/3*I*a^3*c^2*arctan(a*x)^3-1/3*c^2*arctan(a*x)^3/x^3-2*a^2*c^2*arctan(a*
x)^3/x+a^4*c^2*x*arctan(a*x)^3+a^3*c^2*ln(x)+3*a^3*c^2*arctan(a*x)^2*ln(2/(
1+I*a*x))-1/2*a^3*c^2*ln(a^2*x^2+1)+5*a^3*c^2*arctan(a*x)^2*ln(2-2/(1-I*a*x
))-5*I*a^3*c^2*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))+3*I*a^3*c^2*arctan(a*x
)*polylog(2,1-2/(1+I*a*x))+5/2*a^3*c^2*polylog(3,-1+2/(1-I*a*x))+3/2*a^3*c^
2*polylog(3,1-2/(1+I*a*x))
```

Rubi [A] time = 0.79, antiderivative size = 311, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 16, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727, Rules used = {4948, 4846, 4920, 4854, 4884, 4994, 6610, 4852, 4918, 266, 36, 29, 31, 4924, 4868, 4992}

$$\frac{5}{2}a^3c^2\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)+\frac{3}{2}a^3c^2\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)-5ia^3c^2\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+3$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] -((a^2*c^2*ArcTan[a*x])/x) - (a^3*c^2*ArcTan[a*x]^2)/2 - (a*c^2*ArcTan[a*x]
^2)/(2*x^2) - ((2*I)/3)*a^3*c^2*ArcTan[a*x]^3 - (c^2*ArcTan[a*x]^3)/(3*x^3)
 - (2*a^2*c^2*ArcTan[a*x]^3)/x + a^4*c^2*x*ArcTan[a*x]^3 + a^3*c^2*Log[x] +
 3*a^3*c^2*ArcTan[a*x]^2*Log[2/(1 + I*a*x)] - (a^3*c^2*Log[1 + a^2*x^2])/2
+ 5*a^3*c^2*ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)] - (5*I)*a^3*c^2*ArcTan[a*x
]*PolyLog[2, -1 + 2/(1 - I*a*x)] + (3*I)*a^3*c^2*ArcTan[a*x]*PolyLog[2, 1 -
 2/(1 + I*a*x)] + (5*a^3*c^2*PolyLog[3, -1 + 2/(1 - I*a*x)])/2 + (3*a^3*c^2
*PolyLog[3, 1 - 2/(1 + I*a*x)])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
```

```
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}{x^4}\,dx = \int \left(a^4c^2\tan^{-1}(ax)^3+\frac{c^2\tan^{-1}(ax)^3}{x^4}+\frac{2a^2c^2\tan^{-1}(ax)^3}{x^2}\right)dx$$

$$= c^2\int \frac{\tan^{-1}(ax)^3}{x^4}\,dx+\left(2a^2c^2\right)\int \frac{\tan^{-1}(ax)^3}{x^2}\,dx+\left(a^4c^2\right)\int \tan^{-1}(ax)^3\,dx$$

$$= -\frac{c^2\tan^{-1}(ax)^3}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^3}{x}+a^4c^2x\tan^{-1}(ax)^3+\left(ac^2\right)\int \frac{\tan^{-1}(ax)^2}{x^3\left(1+a^2x^2\right)}$$

$$= -ia^3c^2\tan^{-1}(ax)^3-\frac{c^2\tan^{-1}(ax)^3}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^3}{x}+a^4c^2x\tan^{-1}(ax)^3+\left(ac^2\right.$$

$$= -\frac{ac^2\tan^{-1}(ax)^2}{2x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^3-\frac{c^2\tan^{-1}(ax)^3}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^3}{x}+a^4c^2$$

$$= -\frac{ac^2\tan^{-1}(ax)^2}{2x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^3-\frac{c^2\tan^{-1}(ax)^3}{3x^3}-\frac{2a^2c^2\tan^{-1}(ax)^3}{x}+a^4c^2$$

$$= -\frac{a^2c^2\tan^{-1}(ax)}{x}-\frac{1}{2}a^3c^2\tan^{-1}(ax)^2-\frac{ac^2\tan^{-1}(ax)^2}{2x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^3-$$

$$= -\frac{a^2c^2\tan^{-1}(ax)}{x}-\frac{1}{2}a^3c^2\tan^{-1}(ax)^2-\frac{ac^2\tan^{-1}(ax)^2}{2x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^3-$$

$$= -\frac{a^2c^2\tan^{-1}(ax)}{x}-\frac{1}{2}a^3c^2\tan^{-1}(ax)^2-\frac{ac^2\tan^{-1}(ax)^2}{2x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^3-$$

$$= -\frac{a^2c^2\tan^{-1}(ax)}{x}-\frac{1}{2}a^3c^2\tan^{-1}(ax)^2-\frac{ac^2\tan^{-1}(ax)^2}{2x^2}-\frac{2}{3}ia^3c^2\tan^{-1}(ax)^3-$$

Mathematica [A] time = 0.52, size = 289, normalized size = 0.93

$$\frac{c^2\left(24a^4x^4\tan^{-1}(ax)^3+120ia^3x^3\tan^{-1}(ax)\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)-72ia^3x^3\tan^{-1}(ax)\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)+60a^3x^3\text{Li}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] (c^2*((-5*I)*a^3*Pi^3*x^3 - 24*a^2*x^2*ArcTan[a*x] - 12*a*x*ArcTan[a*x]^2 -
 12*a^3*x^3*ArcTan[a*x]^2 - 8*ArcTan[a*x]^3 - 48*a^2*x^2*ArcTan[a*x]^3 + (1
6*I)*a^3*x^3*ArcTan[a*x]^3 + 24*a^4*x^4*ArcTan[a*x]^3 + 120*a^3*x^3*ArcTan[
a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + 72*a^3*x^3*ArcTan[a*x]^2*Log[1 + E
^((2*I)*ArcTan[a*x])] + 24*a^3*x^3*Log[(a*x)/Sqrt[1 + a^2*x^2]] + (120*I)*a
^3*x^3*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] - (72*I)*a^3*x^3*ArcT
an[a*x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + 60*a^3*x^3*PolyLog[3, E^((-2*I
)*ArcTan[a*x])] + 36*a^3*x^3*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/(24*x^3)
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^3/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 11.29, size = 5651, normalized size = 18.17

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^3/x^4,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^3/x^4,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^2}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x^4,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^2)/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int a^4\operatorname{atan}^3(ax)\,dx+\int\frac{\operatorname{atan}^3(ax)}{x^4}\,dx+\int\frac{2a^2\operatorname{atan}^3(ax)}{x^2}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**3/x**4,x)
```

```
[Out] c**2*(Integral(a**4*atan(a*x)**3, x) + Integral(atan(a*x)**3/x**4, x) + Int
egral(2*a**2*atan(a*x)**3/x**2, x))
```

3.379 $\int x^3 \left(c + a^2 c x^2\right)^3 \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=381

$$\frac{1}{10} a^6 c^3 x^{10} \tan^{-1}(ax)^3 - \frac{1}{30} a^5 c^3 x^9 \tan^{-1}(ax)^2 + \frac{26 i c^3 \mathrm{Li}_2\left(1 - \frac{2}{iax+1}\right)}{525 a^4} + \frac{3}{8} a^4 c^3 x^8 \tan^{-1}(ax)^3 + \frac{1}{120} a^4 c^3 x^8 \tan^{-1}(ax) -$$

```
[Out] 389/12600*c^3*x/a^3-17/9450*c^3*x^3/a-1/252*a*c^3*x^5-1/840*a^3*c^3*x^7-389
/12600*c^3*arctan(a*x)/a^4-107/4200*c^3*x^2*arctan(a*x)/a^2+53/2100*c^3*x^4
*arctan(a*x)+71/2520*a^2*c^3*x^6*arctan(a*x)+1/120*a^4*c^3*x^8*arctan(a*x)+
26/525*I*c^3*polylog(2,1-2/(1+I*a*x))/a^4+3/40*c^3*x*arctan(a*x)^2/a^3-1/40
*c^3*x^3*arctan(a*x)^2/a-27/200*a*c^3*x^5*arctan(a*x)^2-33/280*a^3*c^3*x^7*
arctan(a*x)^2-1/30*a^5*c^3*x^9*arctan(a*x)^2-1/40*c^3*arctan(a*x)^3/a^4+1/4
*c^3*x^4*arctan(a*x)^3+1/2*a^2*c^3*x^6*arctan(a*x)^3+3/8*a^4*c^3*x^8*arctan
(a*x)^3+1/10*a^6*c^3*x^10*arctan(a*x)^3+52/525*c^3*arctan(a*x)*ln(2/(1+I*a*
x))/a^4+26/525*I*c^3*arctan(a*x)^2/a^4
```

Rubi [A] time = 3.73, antiderivative size = 381, normalized size of antiderivative = 1.00, number of steps used = 184, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4948, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 4846, 4884, 302}

$$\frac{26 i c^3 \mathrm{PolyLog}\left(2, 1 - \frac{2}{1+iax}\right)}{525 a^4} - \frac{1}{840} a^3 c^3 x^7 + \frac{1}{10} a^6 c^3 x^{10} \tan^{-1}(ax)^3 - \frac{1}{30} a^5 c^3 x^9 \tan^{-1}(ax)^2 + \frac{3}{8} a^4 c^3 x^8 \tan^{-1}(ax)^3 + \frac{1}{1}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (389*c^3*x)/(12600*a^3) - (17*c^3*x^3)/(9450*a) - (a*c^3*x^5)/252 - (a^3*c^
3*x^7)/840 - (389*c^3*ArcTan[a*x])/(12600*a^4) - (107*c^3*x^2*ArcTan[a*x])/
(4200*a^2) + (53*c^3*x^4*ArcTan[a*x])/2100 + (71*a^2*c^3*x^6*ArcTan[a*x])/2
520 + (a^4*c^3*x^8*ArcTan[a*x])/120 + (((26*I)/525)*c^3*ArcTan[a*x]^2)/a^4
+ (3*c^3*x*ArcTan[a*x]^2)/(40*a^3) - (c^3*x^3*ArcTan[a*x]^2)/(40*a) - (27*a
*c^3*x^5*ArcTan[a*x]^2)/200 - (33*a^3*c^3*x^7*ArcTan[a*x]^2)/280 - (a^5*c^3
*x^9*ArcTan[a*x]^2)/30 - (c^3*ArcTan[a*x]^3)/(40*a^4) + (c^3*x^4*ArcTan[a*x
]^3)/4 + (a^2*c^3*x^6*ArcTan[a*x]^3)/2 + (3*a^4*c^3*x^8*ArcTan[a*x]^3)/8 +
(a^6*c^3*x^10*ArcTan[a*x]^3)/10 + (52*c^3*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(
525*a^4) + (((26*I)/525)*c^3*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^4
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
```

```
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rubi steps

$$\int x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3\,dx = \int\left(c^3x^3\tan^{-1}(ax)^3+3a^2c^3x^5\tan^{-1}(ax)^3+3a^4c^3x^7\tan^{-1}(ax)^3+a^6c^3x^9\tan\right.$$

$$= c^3\int x^3\tan^{-1}(ax)^3\,dx+\left(3a^2c^3\right)\int x^5\tan^{-1}(ax)^3\,dx+\left(3a^4c^3\right)\int x^7\tan^{-1}(\right.$$

$$= \frac{1}{4}c^3x^4\tan^{-1}(ax)^3+\frac{1}{2}a^2c^3x^6\tan^{-1}(ax)^3+\frac{3}{8}a^4c^3x^8\tan^{-1}(ax)^3+\frac{1}{10}a^6c^3x^{10}$$

$$= \frac{1}{4}c^3x^4\tan^{-1}(ax)^3+\frac{1}{2}a^2c^3x^6\tan^{-1}(ax)^3+\frac{3}{8}a^4c^3x^8\tan^{-1}(ax)^3+\frac{1}{10}a^6c^3x^{10}$$

$$= -\frac{c^3x^3\tan^{-1}(ax)^2}{4a}-\frac{3}{10}ac^3x^5\tan^{-1}(ax)^2-\frac{9}{56}a^3c^3x^7\tan^{-1}(ax)^2-\frac{1}{30}a^5c^3x^9$$

$$= \frac{3c^3x\tan^{-1}(ax)^2}{4a^3}+\frac{c^3x^3\tan^{-1}(ax)^2}{4a}-\frac{3}{40}ac^3x^5\tan^{-1}(ax)^2-\frac{33}{280}a^3c^3x^7\tan$$

$$= \frac{c^3x^2\tan^{-1}(ax)}{4a^2}+\frac{3}{20}c^3x^4\tan^{-1}(ax)+\frac{3}{56}a^2c^3x^6\tan^{-1}(ax)+\frac{1}{120}a^4c^3x^8\tan$$

$$= -\frac{c^3x}{4a^3}-\frac{11c^3x^2\tan^{-1}(ax)}{20a^2}-\frac{3}{70}c^3x^4\tan^{-1}(ax)+\frac{71a^2c^3x^6\tan^{-1}(ax)}{2520}+\frac{1}{120}$$

$$= \frac{55c^3x}{84a^3}-\frac{11c^3x^3}{315a}-\frac{19ac^3x^5}{2100}-\frac{1}{840}a^3c^3x^7+\frac{c^3\tan^{-1}(ax)}{4a^4}+\frac{59c^3x^2\tan^{-1}(ax}{280a^2}$$

$$= -\frac{689c^3x}{2520a^3}+\frac{79c^3x^3}{3780a}-\frac{1}{252}ac^3x^5-\frac{1}{840}a^3c^3x^7-\frac{55c^3\tan^{-1}(ax)}{84a^4}-\frac{107c^3x^2}{420}$$

$$= \frac{389c^3x}{12600a^3}-\frac{17c^3x^3}{9450a}-\frac{1}{252}ac^3x^5-\frac{1}{840}a^3c^3x^7+\frac{689c^3\tan^{-1}(ax)}{2520a^4}-\frac{107c^3x^2}{420}$$

$$= \frac{389c^3x}{12600a^3}-\frac{17c^3x^3}{9450a}-\frac{1}{252}ac^3x^5-\frac{1}{840}a^3c^3x^7-\frac{389c^3\tan^{-1}(ax)}{12600a^4}-\frac{107c^3x^2}{420}$$

$$= \frac{389c^3x}{12600a^3}-\frac{17c^3x^3}{9450a}-\frac{1}{252}ac^3x^5-\frac{1}{840}a^3c^3x^7-\frac{389c^3\tan^{-1}(ax)}{12600a^4}-\frac{107c^3x^2}{420}$$

Mathematica [A] time = 2.18, size = 191, normalized size = 0.50

$$c^3\left(945\left(4a^2x^2-1\right)\left(a^2x^2+1\right)^4\tan^{-1}(ax)^3-ax\left(45a^6x^6+150a^4x^4+68a^2x^2-1167\right)-9\left(140a^9x^9+495a^7x^7\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (c^3*(-(a*x*(-1167 + 68*a^2*x^2 + 150*a^4*x^4 + 45*a^6*x^6)) - 9*(208*I - 3
15*a*x + 105*a^3*x^3 + 567*a^5*x^5 + 495*a^7*x^7 + 140*a^9*x^9)*ArcTan[a*x]
^2 + 945*(1 + a^2*x^2)^4*(-1 + 4*a^2*x^2)*ArcTan[a*x]^3 + 3*ArcTan[a*x]*(-3
89 - 321*a^2*x^2 + 318*a^4*x^4 + 355*a^6*x^6 + 105*a^8*x^8 + 1248*Log[1 + E
^((2*I)*ArcTan[a*x])]) - (1872*I)*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))/(378
00*a^4)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^6c^3x^9 + 3\,a^4c^3x^7 + 3\,a^2c^3x^5 + c^3x^3\right)\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^9 + 3*a^4*c^3*x^7 + 3*a^2*c^3*x^5 + c^3*x^3)*arctan(a*x
)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.13, size = 471, normalized size = 1.24

$$\frac{13ic^3\operatorname{dilog}\left(-\frac{i(ax+i)}{2}\right)}{525a^4}-\frac{13ic^3\operatorname{dilog}\left(\frac{i(ax-i)}{2}\right)}{525a^4}-\frac{13ic^3\ln\left(ax+i\right)^2}{1050a^4}+\frac{13ic^3\ln\left(ax-i\right)^2}{1050a^4}-\frac{26c^3\arctan\left(ax\right)\ln\left(a^2x^2+1\right)}{525a^4}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^3,x)
```

```
[Out] -13/525*I/a^4*c^3*ln(a*x-I)*ln(a^2*x^2+1)-26/525/a^4*c^3*arctan(a*x)*ln(a^2
*x^2+1)-13/1050*I/a^4*c^3*ln(I+a*x)^2+13/1050*I/a^4*c^3*ln(a*x-I)^2+13/525*
I/a^4*c^3*dilog(-1/2*I*(I+a*x))-13/525*I/a^4*c^3*dilog(1/2*I*(a*x-I))+389/1
2600*c^3*x/a^3-17/9450*c^3*x^3/a-1/252*a*c^3*x^5-1/840*a^3*c^3*x^7-389/1260
0*c^3*arctan(a*x)/a^4+53/2100*c^3*x^4*arctan(a*x)-1/40*c^3*arctan(a*x)^3/a^
4+1/4*c^3*x^4*arctan(a*x)^3+71/2520*a^2*c^3*x^6*arctan(a*x)+1/120*a^4*c^3*x
^8*arctan(a*x)-107/4200*c^3*x^2*arctan(a*x)/a^2+3/40*c^3*x*arctan(a*x)^2/a^
3-1/40*c^3*x^3*arctan(a*x)^2/a-27/200*a*c^3*x^5*arctan(a*x)^2-33/280*a^3*c^
3*x^7*arctan(a*x)^2-1/30*a^5*c^3*x^9*arctan(a*x)^2+1/2*a^2*c^3*x^6*arctan(a
*x)^3+3/8*a^4*c^3*x^8*arctan(a*x)^3+1/10*a^6*c^3*x^10*arctan(a*x)^3-13/525*
I/a^4*c^3*ln(I+a*x)*ln(1/2*I*(a*x-I))+13/525*I/a^4*c^3*ln(a*x-I)*ln(-1/2*I*
(I+a*x))+13/525*I/a^4*c^3*ln(I+a*x)*ln(a^2*x^2+1)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int x^3\operatorname{atan}^3(ax)\,dx+\int 3a^2x^5\operatorname{atan}^3(ax)\,dx+\int 3a^4x^7\operatorname{atan}^3(ax)\,dx+\int a^6x^9\operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**3*atan(a*x)**3,x)
```

```
[Out] c**3*(Integral(x**3*atan(a*x)**3, x) + Integral(3*a**2*x**5*atan(a*x)**3, x
) + Integral(3*a**4*x**7*atan(a*x)**3, x) + Integral(a**6*x**9*atan(a*x)**3
, x))
```

3.380 $\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=389

$$\frac{1}{9}a^6c^3x^9\tan^{-1}(ax)^3-\frac{1}{24}a^5c^3x^8\tan^{-1}(ax)^2+\frac{3}{7}a^4c^3x^7\tan^{-1}(ax)^3+\frac{1}{84}a^4c^3x^7\tan^{-1}(ax)-\frac{8c^3\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{105a^3}-\frac{16ic^3\text{Li}$$

```
[Out] -107/7560*c^3*x^2/a-11/1260*a*c^3*x^4-1/504*a^3*c^3*x^6-47/1260*c^3*x*arcta
n(a*x)/a^2+239/3780*c^3*x^3*arctan(a*x)+59/1260*a^2*c^3*x^5*arctan(a*x)+1/8
4*a^4*c^3*x^7*arctan(a*x)+47/2520*c^3*arctan(a*x)^2/a^3-8/105*c^3*x^2*arcta
n(a*x)^2/a-89/420*a*c^3*x^4*arctan(a*x)^2-10/63*a^3*c^3*x^6*arctan(a*x)^2-1
/24*a^5*c^3*x^8*arctan(a*x)^2-16/315*I*c^3*arctan(a*x)^3/a^3+1/3*c^3*x^3*ar
ctan(a*x)^3+3/5*a^2*c^3*x^5*arctan(a*x)^3+3/7*a^4*c^3*x^7*arctan(a*x)^3+1/9
*a^6*c^3*x^9*arctan(a*x)^3-16/105*c^3*arctan(a*x)^2*ln(2/(1+I*a*x))/a^3+31/
945*c^3*ln(a^2*x^2+1)/a^3-16/105*I*c^3*arctan(a*x)*polylog(2,1-2/(1+I*a*x))
/a^3-8/105*c^3*polylog(3,1-2/(1+I*a*x))/a^3
```

Rubi [A] time = 3.04, antiderivative size = 389, normalized size of antiderivative = 1.00, number of steps used = 132, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4948, 4852, 4916, 4846, 260, 4884, 4920, 4854, 4994, 6610, 266, 43}

$$-\frac{8c^3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{105a^3}-\frac{16ic^3\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{105a^3}-\frac{1}{504}a^3c^3x^6+\frac{31c^3\log\left(a^2x^2+1\right)}{945a^3}+\frac{1}{9}a^6c^3x^9\ \text{ta}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (-107*c^3*x^2)/(7560*a) - (11*a*c^3*x^4)/1260 - (a^3*c^3*x^6)/504 - (47*c^3
*x*ArcTan[a*x])/(1260*a^2) + (239*c^3*x^3*ArcTan[a*x])/3780 + (59*a^2*c^3*x
^5*ArcTan[a*x])/1260 + (a^4*c^3*x^7*ArcTan[a*x])/84 + (47*c^3*ArcTan[a*x]^2
)/(2520*a^3) - (8*c^3*x^2*ArcTan[a*x]^2)/(105*a) - (89*a*c^3*x^4*ArcTan[a*x
]^2)/420 - (10*a^3*c^3*x^6*ArcTan[a*x]^2)/63 - (a^5*c^3*x^8*ArcTan[a*x]^2)/
24 - (((16*I)/315)*c^3*ArcTan[a*x]^3)/a^3 + (c^3*x^3*ArcTan[a*x]^3)/3 + (3*
a^2*c^3*x^5*ArcTan[a*x]^3)/5 + (3*a^4*c^3*x^7*ArcTan[a*x]^3)/7 + (a^6*c^3*x
^9*ArcTan[a*x]^3)/9 - (16*c^3*ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/(105*a^3) +
 (31*c^3*Log[1 + a^2*x^2])/(945*a^3) - (((16*I)/105)*c^3*ArcTan[a*x]*PolyLo
g[2, 1 - 2/(1 + I*a*x)])/a^3 - (8*c^3*PolyLog[3, 1 - 2/(1 + I*a*x)])/(105*a
^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int x^2 \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3\,dx = \int \left(c^3x^2\tan^{-1}(ax)^3 + 3a^2c^3x^4\tan^{-1}(ax)^3 + 3a^4c^3x^6\tan^{-1}(ax)^3 + a^6c^3x^8\tan^{-1}\right.$$

$$= c^3\int x^2\tan^{-1}(ax)^3\,dx + \left(3a^2c^3\right)\int x^4\tan^{-1}(ax)^3\,dx + \left(3a^4c^3\right)\int x^6\tan^{-1}(ax)$$

$$= \frac{1}{3}c^3x^3\tan^{-1}(ax)^3 + \frac{3}{5}a^2c^3x^5\tan^{-1}(ax)^3 + \frac{3}{7}a^4c^3x^7\tan^{-1}(ax)^3 + \frac{1}{9}a^6c^3x^9\tan^{-}$$

$$= \frac{1}{3}c^3x^3\tan^{-1}(ax)^3 + \frac{3}{5}a^2c^3x^5\tan^{-1}(ax)^3 + \frac{3}{7}a^4c^3x^7\tan^{-1}(ax)^3 + \frac{1}{9}a^6c^3x^9\tan^{-}$$

$$= -\frac{c^3x^2\tan^{-1}(ax)^2}{2a} - \frac{9}{20}ac^3x^4\tan^{-1}(ax)^2 - \frac{3}{14}a^3c^3x^6\tan^{-1}(ax)^2 - \frac{1}{24}a^5c^3x^8\tan$$

$$= \frac{2c^3x^2\tan^{-1}(ax)^2}{5a} - \frac{9}{70}ac^3x^4\tan^{-1}(ax)^2 - \frac{10}{63}a^3c^3x^6\tan^{-1}(ax)^2 - \frac{1}{24}a^5c^3x^8\tan$$

$$= \frac{c^3x\tan^{-1}(ax)}{a^2} + \frac{3}{10}c^3x^3\tan^{-1}(ax) + \frac{3}{35}a^2c^3x^5\tan^{-1}(ax) + \frac{1}{84}a^4c^3x^7\tan^{-1}(ax$$

$$= -\frac{17c^3x\tan^{-1}(ax)}{10a^2} - \frac{2}{35}c^3x^3\tan^{-1}(ax) + \frac{59a^2c^3x^5\tan^{-1}(ax)}{1260} + \frac{1}{84}a^4c^3x^7\tan^{-}$$

$$= \frac{23c^3x\tan^{-1}(ax)}{35a^2} + \frac{239c^3x^3\tan^{-1}(ax)}{3780} + \frac{59a^2c^3x^5\tan^{-1}(ax)}{1260} + \frac{1}{84}a^4c^3x^7\tan^{-}$$

$$= -\frac{19c^3x^2}{168a} - \frac{31ac^3x^4}{1680} - \frac{1}{504}a^3c^3x^6 - \frac{47c^3x\tan^{-1}(ax)}{1260a^2} + \frac{239c^3x^3\tan^{-1}(ax)}{3780} + \frac{59}{}$$

$$= \frac{29c^3x^2}{630a} - \frac{11ac^3x^4}{1260} - \frac{1}{504}a^3c^3x^6 - \frac{47c^3x\tan^{-1}(ax)}{1260a^2} + \frac{239c^3x^3\tan^{-1}(ax)}{3780} + \frac{59}{}$$

$$= -\frac{107c^3x^2}{7560a} - \frac{11ac^3x^4}{1260} - \frac{1}{504}a^3c^3x^6 - \frac{47c^3x\tan^{-1}(ax)}{1260a^2} + \frac{239c^3x^3\tan^{-1}(ax)}{3780} + $$

Mathematica [A] time = 2.02, size = 281, normalized size = 0.72

$$\frac{c^3\left(840a^9x^9\tan^{-1}(ax)^3 - 315a^8x^8\tan^{-1}(ax)^2 + 3240a^7x^7\tan^{-1}(ax)^3 + 90a^7x^7\tan^{-1}(ax) - 15a^6x^6 - 1200a^6x^6\tan\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (c^3*(-56 - 107*a^2*x^2 - 66*a^4*x^4 - 15*a^6*x^6 - 282*a*x*ArcTan[a*x] + 4
78*a^3*x^3*ArcTan[a*x] + 354*a^5*x^5*ArcTan[a*x] + 90*a^7*x^7*ArcTan[a*x] +
 141*ArcTan[a*x]^2 - 576*a^2*x^2*ArcTan[a*x]^2 - 1602*a^4*x^4*ArcTan[a*x]^2
 - 1200*a^6*x^6*ArcTan[a*x]^2 - 315*a^8*x^8*ArcTan[a*x]^2 + (384*I)*ArcTan[
a*x]^3 + 2520*a^3*x^3*ArcTan[a*x]^3 + 4536*a^5*x^5*ArcTan[a*x]^3 + 3240*a^7
*x^7*ArcTan[a*x]^3 + 840*a^9*x^9*ArcTan[a*x]^3 - 1152*ArcTan[a*x]^2*Log[1 +
 E^((2*I)*ArcTan[a*x])] + 248*Log[1 + a^2*x^2] + (1152*I)*ArcTan[a*x]*PolyL
og[2, -E^((2*I)*ArcTan[a*x])] - 576*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/(7
560*a^3)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^6c^3x^8 + 3\,a^4c^3x^6 + 3\,a^2c^3x^4 + c^3x^2\right)\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4 + c^3*x^2)*arctan(a*x
)^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 24.35, size = 1181, normalized size = 3.04

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^3,x)
```

```
[Out] -4/105*I/a^3*c^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2
*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2-107/7560*c^3*x^2/a-1
1/1260*a*c^3*x^4-1/504*a^3*c^3*x^6+239/3780*c^3*x^3*arctan(a*x)+1/3*c^3*x^3
*arctan(a*x)^3+47/2520*c^3*arctan(a*x)^2/a^3-47/1260*c^3*x*arctan(a*x)/a^2-
8/105*c^3*x^2*arctan(a*x)^2/a-89/420*a*c^3*x^4*arctan(a*x)^2-10/63*a^3*c^3*
x^6*arctan(a*x)^2-1/24*a^5*c^3*x^8*arctan(a*x)^2+3/5*a^2*c^3*x^5*arctan(a*x
)^3+3/7*a^4*c^3*x^7*arctan(a*x)^3+1/9*a^6*c^3*x^9*arctan(a*x)^3+4/105*I/a^3
*c^3*Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x
)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)-1/135/a^3*c^3+4/105*I/a^3*c^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*arct
an(a*x)^2+4/105*I/a^3*c^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a
^2*x^2+1)+1)^2)^3*arctan(a*x)^2-4/105*I/a^3*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2
*x^2+1)+1)^2)^3*arctan(a*x)^2+16/105*I/a^3*c^3*arctan(a*x)*polylog(2,-(1+I*
a*x)^2/(a^2*x^2+1))-4/105*I/a^3*c^3*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2
)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*
x)^2+8/105*I/a^3*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*
x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2-8/105*I/a^3*c^3*Pi*csgn(I*(1+I*a*x)/
(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*arctan(a*x)^2+4/105*I/
a^3*c^3*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^
2+1))*arctan(a*x)^2-4/105*I/a^3*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^
2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2-16/105/a^3*c^3*arctan
(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+8/105/a^3*c^3*arctan(a*x)^2*ln(a^2*
x^2+1)-16/105/a^3*c^3*arctan(a*x)^2*ln(2)+16/315*I/a^3*c^3*arctan(a*x)^3+62
/945*I/a^3*c^3*arctan(a*x)-8/105/a^3*c^3*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1)
)-62/945/a^3*c^3*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+59/1260*a^2*c^3*x^5*arctan(a
*x)+1/84*a^4*c^3*x^7*arctan(a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2520}\left(35\,a^6c^3x^9 + 135\,a^4c^3x^7 + 189\,a^2c^3x^5 + 105\,c^3x^3\right)\arctan\left(ax\right)^3 - \frac{1}{3360}\left(35\,a^6c^3x^9 + 135\,a^4c^3x^7 + 189\,a^2c^3\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2520*(35*a^6*c^3*x^9 + 135*a^4*c^3*x^7 + 189*a^2*c^3*x^5 + 105*c^3*x^3)*a
rctan(a*x)^3 - 1/3360*(35*a^6*c^3*x^9 + 135*a^4*c^3*x^7 + 189*a^2*c^3*x^5 +
 105*c^3*x^3)*arctan(a*x)*log(a^2*x^2 + 1)^2 + integrate(1/3360*(2940*(a^8*
c^3*x^10 + 4*a^6*c^3*x^8 + 6*a^4*c^3*x^6 + 4*a^2*c^3*x^4 + c^3*x^2)*arctan(
a*x)^3 - 4*(35*a^7*c^3*x^9 + 135*a^5*c^3*x^7 + 189*a^3*c^3*x^5 + 105*a*c^3*
x^3)*arctan(a*x)^2 + 4*(35*a^8*c^3*x^10 + 135*a^6*c^3*x^8 + 189*a^4*c^3*x^6
 + 105*a^2*c^3*x^4)*arctan(a*x)*log(a^2*x^2 + 1) + (35*a^7*c^3*x^9 + 135*a^
5*c^3*x^7 + 189*a^3*c^3*x^5 + 105*a*c^3*x^3 + 315*(a^8*c^3*x^10 + 4*a^6*c^3
*x^8 + 6*a^4*c^3*x^6 + 4*a^2*c^3*x^4 + c^3*x^2)*arctan(a*x))*log(a^2*x^2 +
1)^2)/(a^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int x^{2} \operatorname{atan}^{3}{\left(a x \right)}\, dx + \int 3 a^{2} x^{4} \operatorname{atan}^{3}{\left(a x \right)}\, dx + \int 3 a^{4} x^{6} \operatorname{atan}^{3}{\left(a x \right)}\, dx + \int a^{6} x^{8} \operatorname{atan}^{3}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**3*atan(a*x)**3,x)
```

```
[Out] c**3*(Integral(x**2*atan(a*x)**3, x) + Integral(3*a**2*x**4*atan(a*x)**3, x
) + Integral(3*a**4*x**6*atan(a*x)**3, x) + Integral(a**6*x**8*atan(a*x)**3
, x))
```

3.381 $\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=308

$$-\frac{1}{280}a^3c^3x^5-\frac{6ic^3\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{35a^2}-\frac{3c^3x\left(a^2x^2+1\right)^3\tan^{-1}(ax)^2}{56a}-\frac{9c^3x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}{140a}-\frac{3c^3x\left(a^2x^2+1\right)\text{t}}{35a}$$

```
[Out] -19/140*c^3*x/a-19/840*a*c^3*x^3-1/280*a^3*c^3*x^5+3/35*c^3*(a^2*x^2+1)*arc
tan(a*x)/a^2+9/280*c^3*(a^2*x^2+1)^2*arctan(a*x)/a^2+1/56*c^3*(a^2*x^2+1)^3
*arctan(a*x)/a^2-6/35*I*c^3*arctan(a*x)^2/a^2-6/35*c^3*x*arctan(a*x)^2/a-3/
35*c^3*x*(a^2*x^2+1)*arctan(a*x)^2/a-9/140*c^3*x*(a^2*x^2+1)^2*arctan(a*x)^
2/a-3/56*c^3*x*(a^2*x^2+1)^3*arctan(a*x)^2/a+1/8*c^3*(a^2*x^2+1)^4*arctan(a
*x)^3/a^2-12/35*c^3*arctan(a*x)*ln(2/(1+I*a*x))/a^2-6/35*I*c^3*polylog(2,1-
2/(1+I*a*x))/a^2
```

Rubi [A] time = 0.25, antiderivative size = 308, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {4930, 4880, 4846, 4920, 4854, 2402, 2315, 8, 194}

$$-\frac{6ic^3\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{35a^2}-\frac{1}{280}a^3c^3x^5-\frac{3c^3x\left(a^2x^2+1\right)^3\tan^{-1}(ax)^2}{56a}-\frac{9c^3x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}{140a}-\frac{3c^3x\left(a^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (-19*c^3*x)/(140*a) - (19*a*c^3*x^3)/840 - (a^3*c^3*x^5)/280 + (3*c^3*(1 +
a^2*x^2)*ArcTan[a*x])/(35*a^2) + (9*c^3*(1 + a^2*x^2)^2*ArcTan[a*x])/(280*a
^2) + (c^3*(1 + a^2*x^2)^3*ArcTan[a*x])/(56*a^2) - (((6*I)/35)*c^3*ArcTan[a
*x]^2)/a^2 - (6*c^3*x*ArcTan[a*x]^2)/(35*a) - (3*c^3*x*(1 + a^2*x^2)*ArcTan
[a*x]^2)/(35*a) - (9*c^3*x*(1 + a^2*x^2)^2*ArcTan[a*x]^2)/(140*a) - (3*c^3*
x*(1 + a^2*x^2)^3*ArcTan[a*x]^2)/(56*a) + (c^3*(1 + a^2*x^2)^4*ArcTan[a*x]^
3)/(8*a^2) - (12*c^3*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(35*a^2) - (((6*I)/35)
*c^3*PolyLog[2, 1 - 2/(1 + I*a*x)])/a^2
```

Rule 8

```
Int[a_, x_Symbol] :> Simp[a*x, x] /; FreeQ[a, x]
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3\,dx=\frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)^3}{8a^2}-\frac{3\int\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2\,dx}{8a}$$
$$=\frac{c^3\left(1+a^2x^2\right)^3\tan^{-1}(ax)}{56a^2}-\frac{3c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)^2}{56a}+\frac{c^3\left(1+a^2x^2\right)^4\tan}{8a^2}$$
$$=\frac{9c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}{280a^2}+\frac{c^3\left(1+a^2x^2\right)^3\tan^{-1}(ax)}{56a^2}-\frac{9c^3x\left(1+a^2x^2\right)^2\tan}{140a}$$
$$=-\frac{c^3x}{20a}-\frac{19}{840}ac^3x^3-\frac{1}{280}a^3c^3x^5+\frac{3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a^2}+\frac{9c^3\left(1+a^2x^2\right)}{280a}$$
$$=-\frac{19c^3x}{140a}-\frac{19}{840}ac^3x^3-\frac{1}{280}a^3c^3x^5+\frac{3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a^2}+\frac{9c^3\left(1+a^2x\right.}{28}$$
$$=-\frac{19c^3x}{140a}-\frac{19}{840}ac^3x^3-\frac{1}{280}a^3c^3x^5+\frac{3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a^2}+\frac{9c^3\left(1+a^2x\right.}{28}$$
$$=-\frac{19c^3x}{140a}-\frac{19}{840}ac^3x^3-\frac{1}{280}a^3c^3x^5+\frac{3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a^2}+\frac{9c^3\left(1+a^2x\right.}{28}$$
$$=-\frac{19c^3x}{140a}-\frac{19}{840}ac^3x^3-\frac{1}{280}a^3c^3x^5+\frac{3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a^2}+\frac{9c^3\left(1+a^2x\right.}{28}$$
$$=-\frac{19c^3x}{140a}-\frac{19}{840}ac^3x^3-\frac{1}{280}a^3c^3x^5+\frac{3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}{35a^2}+\frac{9c^3\left(1+a^2x\right.}{28}$$

Mathematica [A] time = 1.44, size = 157, normalized size = 0.51

$$\frac{c^3\left(105\left(a^2x^2+1\right)^4\tan^{-1}(ax)^3-ax\left(3a^4x^4+19a^2x^2+114\right)-9\left(5a^7x^7+21a^5x^5+35a^3x^3+35ax-16i\right)\tan^{-1}\right.}{840a^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (c^3*(-(a*x*(114 + 19*a^2*x^2 + 3*a^4*x^4)) - 9*(-16*I + 35*a*x + 35*a^3*x^
3 + 21*a^5*x^5 + 5*a^7*x^7)*ArcTan[a*x]^2 + 105*(1 + a^2*x^2)^4*ArcTan[a*x]
^3 + 3*ArcTan[a*x]*(38 + 57*a^2*x^2 + 24*a^4*x^4 + 5*a^6*x^6 - 96*Log[1 + E
^((2*I)*ArcTan[a*x])]) + (144*I)*PolyLog[2, -E^((2*I)*ArcTan[a*x])]))/(840*
a^2)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x\right)\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x)*arctan(a*x)^
3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.12, size = 428, normalized size = 1.39

$$\frac{3ic^3 \operatorname{dilog}\left(\frac{i(ax-i)}{2}\right)}{35a^2}-\frac{3ic^3 \operatorname{dilog}\left(-\frac{i(ax+i)}{2}\right)}{35a^2}+\frac{3ic^3 \ln(ax+i)^2}{70a^2}-\frac{3ic^3 \ln(ax-i)^2}{70a^2}-\frac{9a^3c^3 \arctan(ax)^2 x^5}{40}-\frac{3a\,c^3 \arctan}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^3,x)
```

```
[Out] -9/40*a^3*c^3*arctan(a*x)^2*x^5-3/8*a*c^3*arctan(a*x)^2*x^3+1/56*a^4*c^3*ar
ctan(a*x)*x^6+3/35*a^2*c^3*arctan(a*x)*x^4+6/35/a^2*c^3*arctan(a*x)*ln(a^2*
x^2+1)+3/4*a^2*c^3*arctan(a*x)^3*x^4+3/35*I/a^2*c^3*dilog(1/2*I*(a*x-I))+3/
70*I/a^2*c^3*ln(I+a*x)^2-3/35*I/a^2*c^3*dilog(-1/2*I*(I+a*x))-3/70*I/a^2*c^
3*ln(a*x-I)^2+1/8*a^6*c^3*arctan(a*x)^3*x^8+1/2*a^4*c^3*arctan(a*x)^3*x^6-3
/56*a^5*c^3*arctan(a*x)^2*x^7-1/280*a^3*c^3*x^5-19/140*c^3*x/a-19/840*a*c^3
*x^3-3/8*c^3*x*arctan(a*x)^2/a+3/35*I/a^2*c^3*ln(I+a*x)*ln(1/2*I*(a*x-I))-3
/35*I/a^2*c^3*ln(I+a*x)*ln(a^2*x^2+1)-3/35*I/a^2*c^3*ln(a*x-I)*ln(-1/2*I*(I
+a*x))+3/35*I/a^2*c^3*ln(a*x-I)*ln(a^2*x^2+1)+57/280*c^3*arctan(a*x)*x^2+1/
2*c^3*arctan(a*x)^3*x^2+1/8/a^2*c^3*arctan(a*x)^3+19/140/a^2*c^3*arctan(a*x
)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^3*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x*atan(a*x)^3*(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int x \operatorname{atan}^3(ax)\,dx+\int 3a^2x^3 \operatorname{atan}^3(ax)\,dx+\int 3a^4x^5 \operatorname{atan}^3(ax)\,dx+\int a^6x^7 \operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3*atan(a*x)**3,x)
```

```
[Out] c**3*(Integral(x*atan(a*x)**3, x) + Integral(3*a**2*x**3*atan(a*x)**3, x) +
 Integral(3*a**4*x**5*atan(a*x)**3, x) + Integral(a**6*x**7*atan(a*x)**3, x
))
```

3.382 $\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=388

$$-\frac{c^3\left(a^2x^2+1\right)^2}{140a}-\frac{13c^3\left(a^2x^2+1\right)}{210a}-\frac{7c^3\log\left(a^2x^2+1\right)}{15a}+\frac{1}{7}c^3x\left(a^2x^2+1\right)^3\tan^{-1}(ax)^3+\frac{6}{35}c^3x\left(a^2x^2+1\right)^2\tan^{-1}(a$$

```
[Out] -13/210*c^3*(a^2*x^2+1)/a-1/140*c^3*(a^2*x^2+1)^2/a+14/15*c^3*x*arctan(a*x)
+13/105*c^3*x*(a^2*x^2+1)*arctan(a*x)+1/35*c^3*x*(a^2*x^2+1)^2*arctan(a*x)-
12/35*c^3*(a^2*x^2+1)*arctan(a*x)^2/a-9/70*c^3*(a^2*x^2+1)^2*arctan(a*x)^2/
a-1/14*c^3*(a^2*x^2+1)^3*arctan(a*x)^2/a+48/35*I*c^3*arctan(a*x)*polylog(2,
1-2/(1+I*a*x))/a+16/35*c^3*x*arctan(a*x)^3+8/35*c^3*x*(a^2*x^2+1)*arctan(a*
x)^3+6/35*c^3*x*(a^2*x^2+1)^2*arctan(a*x)^3+1/7*c^3*x*(a^2*x^2+1)^3*arctan(
a*x)^3+48/35*c^3*arctan(a*x)^2*ln(2/(1+I*a*x))/a-7/15*c^3*ln(a^2*x^2+1)/a+1
6/35*I*c^3*arctan(a*x)^3/a+24/35*c^3*polylog(3,1-2/(1+I*a*x))/a
```

Rubi [A] time = 0.34, antiderivative size = 388, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.474, Rules used = {4880, 4846, 4920, 4854, 4884, 4994, 6610, 260, 4878}

$$\frac{24c^3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{35a}+\frac{48ic^3\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{35a}-\frac{c^3\left(a^2x^2+1\right)^2}{140a}-\frac{13c^3\left(a^2x^2+1\right)}{210a}-\frac{7c^3\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (-13*c^3*(1 + a^2*x^2))/(210*a) - (c^3*(1 + a^2*x^2)^2)/(140*a) + (14*c^3*x
*ArcTan[a*x])/15 + (13*c^3*x*(1 + a^2*x^2)*ArcTan[a*x])/105 + (c^3*x*(1 + a
^2*x^2)^2*ArcTan[a*x])/35 - (12*c^3*(1 + a^2*x^2)*ArcTan[a*x]^2)/(35*a) - (
9*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2)/(70*a) - (c^3*(1 + a^2*x^2)^3*ArcTan[a
*x]^2)/(14*a) + (((16*I)/35)*c^3*ArcTan[a*x]^3)/a + (16*c^3*x*ArcTan[a*x]^3
)/35 + (8*c^3*x*(1 + a^2*x^2)*ArcTan[a*x]^3)/35 + (6*c^3*x*(1 + a^2*x^2)^2*
ArcTan[a*x]^3)/35 + (c^3*x*(1 + a^2*x^2)^3*ArcTan[a*x]^3)/7 + (48*c^3*ArcTa
n[a*x]^2*Log[2/(1 + I*a*x)])/(35*a) - (7*c^3*Log[1 + a^2*x^2])/(15*a) + (((
48*I)/35)*c^3*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)])/a + (24*c^3*PolyLo
g[3, 1 - 2/(1 + I*a*x)])/(35*a)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
```

```
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3\,dx = -\frac{c^3\left(1+a^2x^2\right)^3\tan^{-1}(ax)^2}{14a} + \frac{1}{7}c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)^3 + \frac{1}{7}c\int \left(c+a^2cx^2\right)$$

$$= -\frac{c^3\left(1+a^2x^2\right)^2}{140a} + \frac{1}{35}c^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax) - \frac{9c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}{70a}$$

$$= -\frac{13c^3\left(1+a^2x^2\right)}{210a} - \frac{c^3\left(1+a^2x^2\right)^2}{140a} + \frac{13}{105}c^3x\left(1+a^2x^2\right)\tan^{-1}(ax) + \frac{1}{35}c^3x\left(1\right.$$

$$= -\frac{13c^3\left(1+a^2x^2\right)}{210a} - \frac{c^3\left(1+a^2x^2\right)^2}{140a} + \frac{14}{15}c^3x\tan^{-1}(ax) + \frac{13}{105}c^3x\left(1+a^2x^2\right)\tan$$

$$= -\frac{13c^3\left(1+a^2x^2\right)}{210a} - \frac{c^3\left(1+a^2x^2\right)^2}{140a} + \frac{14}{15}c^3x\tan^{-1}(ax) + \frac{13}{105}c^3x\left(1+a^2x^2\right)\tan$$

$$= -\frac{13c^3\left(1+a^2x^2\right)}{210a} - \frac{c^3\left(1+a^2x^2\right)^2}{140a} + \frac{14}{15}c^3x\tan^{-1}(ax) + \frac{13}{105}c^3x\left(1+a^2x^2\right)\tan$$

$$= -\frac{13c^3\left(1+a^2x^2\right)}{210a} - \frac{c^3\left(1+a^2x^2\right)^2}{140a} + \frac{14}{15}c^3x\tan^{-1}(ax) + \frac{13}{105}c^3x\left(1+a^2x^2\right)\tan$$

$$= -\frac{13c^3\left(1+a^2x^2\right)}{210a} - \frac{c^3\left(1+a^2x^2\right)^2}{140a} + \frac{14}{15}c^3x\tan^{-1}(ax) + \frac{13}{105}c^3x\left(1+a^2x^2\right)\tan$$

Mathematica [A] time = 1.22, size = 243, normalized size = 0.63

$$\frac{c^3\left(60a^7x^7\tan^{-1}(ax)^3 - 30a^6x^6\tan^{-1}(ax)^2 + 252a^5x^5\tan^{-1}(ax)^3 + 12a^5x^5\tan^{-1}(ax) - 3a^4x^4 - 144a^4x^4\tan^{-1}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^3*ArcTan[a*x]^3,x]
```

```
[Out] (c^3*(-29 - 32*a^2*x^2 - 3*a^4*x^4 + 456*a*x*ArcTan[a*x] + 76*a^3*x^3*ArcTa
n[a*x] + 12*a^5*x^5*ArcTan[a*x] - 228*ArcTan[a*x]^2 - 342*a^2*x^2*ArcTan[a*
x]^2 - 144*a^4*x^4*ArcTan[a*x]^2 - 30*a^6*x^6*ArcTan[a*x]^2 - (192*I)*ArcTa
n[a*x]^3 + 420*a*x*ArcTan[a*x]^3 + 420*a^3*x^3*ArcTan[a*x]^3 + 252*a^5*x^5*
ArcTan[a*x]^3 + 60*a^7*x^7*ArcTan[a*x]^3 + 576*ArcTan[a*x]^2*Log[1 + E^((2*
I)*ArcTan[a*x])] - 196*Log[1 + a^2*x^2] - (576*I)*ArcTan[a*x]*PolyLog[2, -E
^((2*I)*ArcTan[a*x])] + 288*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/(420*a)
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^3,
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [C]   time = 9.66, size = 1134, normalized size = 2.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^3,x)
```

```
[Out] 38/35*c^3*x*arctan(a*x)+c^3*x*arctan(a*x)^3+24/35*I/a*c^3*Pi*csgn(I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*arctan(a*x)^2-12/35
*I/a*c^3*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x
^2+1))*arctan(a*x)^2+12/35*I/a*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2
*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2+12/35*I/a*c^3*Pi*csgn(
I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2
*x^2+1)+1)^2)^2*arctan(a*x)^2+12/35*I/a*c^3*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2
+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*a
rctan(a*x)^2-24/35*I/a*c^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((
1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a*x)^2-48/35*I/a*c^3*arctan(a*x)*poly
log(2,-(1+I*a*x)^2/(a^2*x^2+1))-12/35*a^3*c^3*arctan(a*x)^2*x^4-57/70*a*c^3
*arctan(a*x)^2*x^2+19/105*a^2*c^3*arctan(a*x)*x^3+1/35*a^4*c^3*arctan(a*x)*
x^5+1/7*a^6*c^3*arctan(a*x)^3*x^7+3/5*a^4*c^3*arctan(a*x)^3*x^5-8/105*a*c^3
*x^2-1/140*a^3*x^4*c^3-19/35/a*c^3*arctan(a*x)^2+14/15/a*c^3*ln((1+I*a*x)^2
/(a^2*x^2+1)+1)+24/35/a*c^3*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-29/420/a*c^
3+a^2*c^3*arctan(a*x)^3*x^3-1/14*a^5*c^3*arctan(a*x)^2*x^6+48/35/a*c^3*arct
an(a*x)^2*ln(2)+48/35/a*c^3*arctan(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-2
4/35/a*c^3*arctan(a*x)^2*ln(a^2*x^2+1)-14/15*I/a*c^3*arctan(a*x)-16/35*I/a*
c^3*arctan(a*x)^3-12/35*I/a*c^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x
)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2+12/35*I/a*c^3*Pi*csgn(I*((1+I*a*x)^2/
(a^2*x^2+1)+1)^2)^3*arctan(a*x)^2-12/35*I/a*c^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*
x^2+1))^3*arctan(a*x)^2-12/35*I/a*c^3*Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/
(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x
^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)
```

maxima [F]   time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 980*a^8*c^3*integrate(1/1120*x^8*arctan(a*x)^3/(a^2*x^2 + 1), x) + 105*a^8*
c^3*integrate(1/1120*x^8*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) +
 60*a^8*c^3*integrate(1/1120*x^8*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*x^2 + 1)
, x) - 60*a^7*c^3*integrate(1/1120*x^7*arctan(a*x)^2/(a^2*x^2 + 1), x) + 15
*a^7*c^3*integrate(1/1120*x^7*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 3920*a
^6*c^3*integrate(1/1120*x^6*arctan(a*x)^3/(a^2*x^2 + 1), x) + 420*a^6*c^3*i
ntegrate(1/1120*x^6*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 252*
a^6*c^3*integrate(1/1120*x^6*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x)
 - 252*a^5*c^3*integrate(1/1120*x^5*arctan(a*x)^2/(a^2*x^2 + 1), x) + 63*a^
5*c^3*integrate(1/1120*x^5*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 5880*a^4*
c^3*integrate(1/1120*x^4*arctan(a*x)^3/(a^2*x^2 + 1), x) + 630*a^4*c^3*inte
grate(1/1120*x^4*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 420*a^4
*c^3*integrate(1/1120*x^4*arctan(a*x)*log(a^2*x^2 + 1)/(a^2*x^2 + 1), x) -
420*a^3*c^3*integrate(1/1120*x^3*arctan(a*x)^2/(a^2*x^2 + 1), x) + 105*a^3*
c^3*integrate(1/1120*x^3*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1), x) + 7/32*c^3*ar
ctan(a*x)^4/a + 3920*a^2*c^3*integrate(1/1120*x^2*arctan(a*x)^3/(a^2*x^2 +
1), x) + 420*a^2*c^3*integrate(1/1120*x^2*arctan(a*x)*log(a^2*x^2 + 1)^2/(a
^2*x^2 + 1), x) + 420*a^2*c^3*integrate(1/1120*x^2*arctan(a*x)*log(a^2*x^2
+ 1)/(a^2*x^2 + 1), x) - 420*a*c^3*integrate(1/1120*x*arctan(a*x)^2/(a^2*x^
```

```
2 + 1), x) + 105*a*c^3*integrate(1/1120*x*log(a^2*x^2 + 1)^2/(a^2*x^2 + 1),
 x) + 1/280*(5*a^6*c^3*x^7 + 21*a^4*c^3*x^5 + 35*a^2*c^3*x^3 + 35*c^3*x)*ar
ctan(a*x)^3 + 105*c^3*integrate(1/1120*arctan(a*x)*log(a^2*x^2 + 1)^2/(a^2*
x^2 + 1), x) - 3/1120*(5*a^6*c^3*x^7 + 21*a^4*c^3*x^5 + 35*a^2*c^3*x^3 + 35
*c^3*x)*arctan(a*x)*log(a^2*x^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^3*(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int 3 a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)}\, dx + \int 3 a^{4} x^{4} \operatorname{atan}^{3}{\left(a x \right)}\, dx + \int a^{6} x^{6} \operatorname{atan}^{3}{\left(a x \right)}\, dx + \int \operatorname{atan}^{3}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**3,x)
```

```
[Out] c**3*(Integral(3*a**2*x**2*atan(a*x)**3, x) + Integral(3*a**4*x**4*atan(a*x
)**3, x) + Integral(a**6*x**6*atan(a*x)**3, x) + Integral(atan(a*x)**3, x))
```

3.383 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^3}{x} dx$

Optimal. Leaf size=447

$$\frac{1}{6}a^6c^3x^6\tan^{-1}(ax)^3-\frac{1}{10}a^5c^3x^5\tan^{-1}(ax)^2+\frac{3}{4}a^4c^3x^4\tan^{-1}(ax)^3+\frac{1}{20}a^4c^3x^4\tan^{-1}(ax)-\frac{1}{60}a^3c^3x^3-\frac{7}{12}a^3c^3x^3\tan^{-1}($$

```
[Out] -13/30*a*c^3*x-1/60*a^3*c^3*x^3+13/30*c^3*arctan(a*x)+29/60*a^2*c^3*x^2*arc
tan(a*x)+1/20*a^4*c^3*x^4*arctan(a*x)-3/2*I*c^3*arctan(a*x)^2*polylog(2,1-2
/(1+I*a*x))-11/4*a*c^3*x*arctan(a*x)^2-7/12*a^3*c^3*x^3*arctan(a*x)^2-1/10*
a^5*c^3*x^5*arctan(a*x)^2+11/12*c^3*arctan(a*x)^3+3/2*a^2*c^3*x^2*arctan(a*
x)^3+3/4*a^4*c^3*x^4*arctan(a*x)^3+1/6*a^6*c^3*x^6*arctan(a*x)^3-2*c^3*arct
an(a*x)^3*arctanh(-1+2/(1+I*a*x))-68/15*c^3*arctan(a*x)*ln(2/(1+I*a*x))+3/4
*I*c^3*polylog(4,1-2/(1+I*a*x))-34/15*I*c^3*polylog(2,1-2/(1+I*a*x))+3/2*I*
c^3*arctan(a*x)^2*polylog(2,-1+2/(1+I*a*x))-3/2*c^3*arctan(a*x)*polylog(3,1
-2/(1+I*a*x))+3/2*c^3*arctan(a*x)*polylog(3,-1+2/(1+I*a*x))-34/15*I*c^3*arc
tan(a*x)^2-3/4*I*c^3*polylog(4,-1+2/(1+I*a*x))
```

Rubi [A] time = 1.66, antiderivative size = 447, normalized size of antiderivative = 1.00, number of steps used = 69, number of rules used = 17, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.773, Rules used = {4948, 4850, 4988, 4884, 4994, 4998, 6610, 4852, 4916, 4846, 4920, 4854, 2402, 2315, 321, 203, 302}

$$-\frac{34}{15}ic^3\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{3}{4}ic^3\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)-\frac{3}{4}ic^3\text{PolyLog}\left(4,-1+\frac{2}{1+iax}\right)-\frac{3}{2}ic^3\tan^{-1}(ax)$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x,x]
```

```
[Out] (-13*a*c^3*x)/30 - (a^3*c^3*x^3)/60 + (13*c^3*ArcTan[a*x])/30 + (29*a^2*c^3
*x^2*ArcTan[a*x])/60 + (a^4*c^3*x^4*ArcTan[a*x])/20 - ((34*I)/15)*c^3*ArcTa
n[a*x]^2 - (11*a*c^3*x*ArcTan[a*x]^2)/4 - (7*a^3*c^3*x^3*ArcTan[a*x]^2)/12
- (a^5*c^3*x^5*ArcTan[a*x]^2)/10 + (11*c^3*ArcTan[a*x]^3)/12 + (3*a^2*c^3*x
^2*ArcTan[a*x]^3)/2 + (3*a^4*c^3*x^4*ArcTan[a*x]^3)/4 + (a^6*c^3*x^6*ArcTan
[a*x]^3)/6 + 2*c^3*ArcTan[a*x]^3*ArcTanh[1 - 2/(1 + I*a*x)] - (68*c^3*ArcTa
n[a*x]*Log[2/(1 + I*a*x)])/15 - ((34*I)/15)*c^3*PolyLog[2, 1 - 2/(1 + I*a*x
)] - ((3*I)/2)*c^3*ArcTan[a*x]^2*PolyLog[2, 1 - 2/(1 + I*a*x)] + ((3*I)/2)*
c^3*ArcTan[a*x]^2*PolyLog[2, -1 + 2/(1 + I*a*x)] - (3*c^3*ArcTan[a*x]*PolyL
og[3, 1 - 2/(1 + I*a*x)])/2 + (3*c^3*ArcTan[a*x]*PolyLog[3, -1 + 2/(1 + I*a
*x)])/2 + ((3*I)/4)*c^3*PolyLog[4, 1 - 2/(1 + I*a*x)] - ((3*I)/4)*c^3*PolyL
og[4, -1 + 2/(1 + I*a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
```

```
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}{x}\,dx = \int \left(\frac{c^3\tan^{-1}(ax)^3}{x} + 3a^2c^3x\tan^{-1}(ax)^3 + 3a^4c^3x^3\tan^{-1}(ax)^3 + a^6c^3x^5\tan^{-1}(a\right.$$

$$= c^3\int \frac{\tan^{-1}(ax)^3}{x}\,dx + \left(3a^2c^3\right)\int x\tan^{-1}(ax)^3\,dx + \left(3a^4c^3\right)\int x^3\tan^{-1}(ax)^3\,d$$

$$= \frac{3}{2}a^2c^3x^2\tan^{-1}(ax)^3 + \frac{3}{4}a^4c^3x^4\tan^{-1}(ax)^3 + \frac{1}{6}a^6c^3x^6\tan^{-1}(ax)^3 + 2c^3\tan^{-1}($$

$$= \frac{3}{2}a^2c^3x^2\tan^{-1}(ax)^3 + \frac{3}{4}a^4c^3x^4\tan^{-1}(ax)^3 + \frac{1}{6}a^6c^3x^6\tan^{-1}(ax)^3 + 2c^3\tan^{-1}($$

$$= -\frac{9}{2}ac^3x\tan^{-1}(ax)^2 - \frac{3}{4}a^3c^3x^3\tan^{-1}(ax)^2 - \frac{1}{10}a^5c^3x^5\tan^{-1}(ax)^2 + \frac{3}{2}c^3\tan^{-1}($$

$$= -\frac{9}{2}ic^3\tan^{-1}(ax)^2 - \frac{9}{4}ac^3x\tan^{-1}(ax)^2 - \frac{7}{12}a^3c^3x^3\tan^{-1}(ax)^2 - \frac{1}{10}a^5c^3x^5\tan$$

$$= \frac{3}{4}a^2c^3x^2\tan^{-1}(ax) + \frac{1}{20}a^4c^3x^4\tan^{-1}(ax) - \frac{3}{2}ic^3\tan^{-1}(ax)^2 - \frac{11}{4}ac^3x\tan^{-1}(a$$

$$= -\frac{3}{4}ac^3x + \frac{29}{60}a^2c^3x^2\tan^{-1}(ax) + \frac{1}{20}a^4c^3x^4\tan^{-1}(ax) - \frac{34}{15}ic^3\tan^{-1}(ax)^2 - \frac{11}{4}$$

$$= -\frac{13}{30}ac^3x - \frac{1}{60}a^3c^3x^3 + \frac{3}{4}c^3\tan^{-1}(ax) + \frac{29}{60}a^2c^3x^2\tan^{-1}(ax) + \frac{1}{20}a^4c^3x^4\tan$$

$$= -\frac{13}{30}ac^3x - \frac{1}{60}a^3c^3x^3 + \frac{13}{30}c^3\tan^{-1}(ax) + \frac{29}{60}a^2c^3x^2\tan^{-1}(ax) + \frac{1}{20}a^4c^3x^4\tan$$

$$= -\frac{13}{30}ac^3x - \frac{1}{60}a^3c^3x^3 + \frac{13}{30}c^3\tan^{-1}(ax) + \frac{29}{60}a^2c^3x^2\tan^{-1}(ax) + \frac{1}{20}a^4c^3x^4\tan$$

Mathematica [A] time = 1.07, size = 350, normalized size = 0.78

$$\frac{1}{960}c^3\left(160a^6x^6\tan^{-1}(ax)^3 - 96a^5x^5\tan^{-1}(ax)^2 + 720a^4x^4\tan^{-1}(ax)^3 + 48a^4x^4\tan^{-1}(ax) - 16a^3x^3 - 560a^3x^3\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x,x]
```

```
[Out] (c^3*((-15*I)*Pi^4 - 416*a*x - 16*a^3*x^3 + 416*ArcTan[a*x] + 464*a^2*x^2*A
rcTan[a*x] + 48*a^4*x^4*ArcTan[a*x] + (2176*I)*ArcTan[a*x]^2 - 2640*a*x*Arc
Tan[a*x]^2 - 560*a^3*x^3*ArcTan[a*x]^2 - 96*a^5*x^5*ArcTan[a*x]^2 + 880*Arc
Tan[a*x]^3 + 1440*a^2*x^2*ArcTan[a*x]^3 + 720*a^4*x^4*ArcTan[a*x]^3 + 160*a
^6*x^6*ArcTan[a*x]^3 + (480*I)*ArcTan[a*x]^4 + 960*ArcTan[a*x]^3*Log[1 - E^
((-2*I)*ArcTan[a*x])] - 4352*ArcTan[a*x]*Log[1 + E^((2*I)*ArcTan[a*x])] - 9
60*ArcTan[a*x]^3*Log[1 + E^((2*I)*ArcTan[a*x])] + (1440*I)*ArcTan[a*x]^2*Po
lyLog[2, E^((-2*I)*ArcTan[a*x])] + (32*I)*(68 + 45*ArcTan[a*x]^2)*PolyLog[2
, -E^((2*I)*ArcTan[a*x])] + 1440*ArcTan[a*x]*PolyLog[3, E^((-2*I)*ArcTan[a*
x])] - 1440*ArcTan[a*x]*PolyLog[3, -E^((2*I)*ArcTan[a*x])] - (720*I)*PolyLo
g[4, E^((-2*I)*ArcTan[a*x])] - (720*I)*PolyLog[4, -E^((2*I)*ArcTan[a*x])]))
/960
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)\arctan\left(ax\right)^3}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^3/
x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 17.05, size = 664, normalized size = 1.49

$$\frac{c^3 \left(iax + 55 \arctan(ax)^3 ax - 3i \arctan(ax) a^2x^2 + 35 \arctan(ax)^3 a^3x^3 - 35i \arctan(ax)^3 a^2x^2 + 10 \arctan(ax)^3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^3/x,x)
```

```
[Out] 1/60*c^3*(I*a*x+55*arctan(a*x)^3*a*x-3*I*arctan(a*x)*a^2*x^2+35*arctan(a*x)
^3*a^3*x^3-35*I*arctan(a*x)^3*a^2*x^2+10*arctan(a*x)^3*a^5*x^5-136*arctan(a
*x)^2-10*I*arctan(a*x)^3*a^4*x^4-29*arctan(a*x)^2*x^2*a^2+6*I*arctan(a*x)^2
*a^3*x^3-6*arctan(a*x)^2*x^4*a^4+29*I*arctan(a*x)^2*a*x+26*arctan(a*x)*x*a-
26*I*arctan(a*x)+3*arctan(a*x)*x^3*a^3-25-55*I*arctan(a*x)^3-a^2*x^2)*(I+a*
x)+68/15*I*c^3*arctan(a*x)^2-68/15*c^3*arctan(a*x)*ln((1+I*a*x)^2/(a^2*x^2+
1)+1)-3/4*I*c^3*polylog(4,-(1+I*a*x)^2/(a^2*x^2+1))-c^3*arctan(a*x)^3*ln((1
+I*a*x)^2/(a^2*x^2+1)+1)+3/2*I*c^3*arctan(a*x)^2*polylog(2,-(1+I*a*x)^2/(a^
2*x^2+1))-3/2*c^3*arctan(a*x)*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))+6*I*c^3*p
olylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))+c^3*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2
*x^2+1)^(1/2))-3*I*c^3*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))
+6*c^3*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+34/15*I*c^3*polyl
og(2,-(1+I*a*x)^2/(a^2*x^2+1))+c^3*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)
^(1/2))+6*I*c^3*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*c^3*arctan(a*x)*p
olylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*c^3*arctan(a*x)^2*polylog(2,-(1+
I*a*x)/(a^2*x^2+1)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{96} \left(2 a^6c^3x^6 + 9 a^4c^3x^4 + 18 a^2c^3x^2\right) \arctan(ax)^3 - \frac{1}{128} \left(2 a^6c^3x^6 + 9 a^4c^3x^4 + 18 a^2c^3x^2\right) \arctan(ax) \log\left(a^2x^2 + \right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x,x, algorithm="maxima")
```

```
[Out] 1/96*(2*a^6*c^3*x^6 + 9*a^4*c^3*x^4 + 18*a^2*c^3*x^2)*arctan(a*x)^3 - 1/128
*(2*a^6*c^3*x^6 + 9*a^4*c^3*x^4 + 18*a^2*c^3*x^2)*arctan(a*x)*log(a^2*x^2 +
 1)^2 + integrate(1/128*(112*(a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 +
 4*a^2*c^3*x^2 + c^3)*arctan(a*x)^3 - 4*(2*a^7*c^3*x^7 + 9*a^5*c^3*x^5 + 18
*a^3*c^3*x^3)*arctan(a*x)^2 + 4*(2*a^8*c^3*x^8 + 9*a^6*c^3*x^6 + 18*a^4*c^3
*x^4)*arctan(a*x)*log(a^2*x^2 + 1) + (2*a^7*c^3*x^7 + 9*a^5*c^3*x^5 + 18*a^
3*c^3*x^3 + 12*(a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2
 + c^3)*arctan(a*x))*log(a^2*x^2 + 1)^2)/(a^2*x^3 + x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{\operatorname{atan}^{3}\left(ax\right)}{x}\,dx + \int 3a^{2}x\operatorname{atan}^{3}\left(ax\right)dx + \int 3a^{4}x^{3}\operatorname{atan}^{3}\left(ax\right)dx + \int a^{6}x^{5}\operatorname{atan}^{3}\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**3/x,x)
```

```
[Out] c**3*(Integral(atan(a*x)**3/x, x) + Integral(3*a**2*x*atan(a*x)**3, x) + In
tegral(3*a**4*x**3*atan(a*x)**3, x) + Integral(a**6*x**5*atan(a*x)**3, x))
```

3.384 $\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}{x^2}\,dx$

Optimal. Leaf size=354

$$\frac{1}{5}a^6c^3x^5\tan^{-1}(ax)^3-\frac{3}{20}a^5c^3x^4\tan^{-1}(ax)^2+a^4c^3x^3\tan^{-1}(ax)^3+\frac{1}{10}a^4c^3x^3\tan^{-1}(ax)-\frac{1}{20}a^3c^3x^2-\frac{6}{5}a^3c^3x^2\tan^{-1}(ax)$$

```
[Out] -1/20*a^3*c^3*x^2+21/10*a^2*c^3*x*arctan(a*x)+1/10*a^4*c^3*x^3*arctan(a*x)-
21/20*a*c^3*arctan(a*x)^2-6/5*a^3*c^3*x^2*arctan(a*x)^2-3/20*a^5*c^3*x^4*ar
ctan(a*x)^2+33/5*I*a*c^3*arctan(a*x)*polylog(2,1-2/(1+I*a*x))-c^3*arctan(a*
x)^3/x+3*a^2*c^3*x*arctan(a*x)^3+a^4*c^3*x^3*arctan(a*x)^3+1/5*a^6*c^3*x^5*
arctan(a*x)^3+33/5*a*c^3*arctan(a*x)^2*ln(2/(1+I*a*x))-a*c^3*ln(a^2*x^2+1)+
3*a*c^3*arctan(a*x)^2*ln(2-2/(1-I*a*x))-3*I*a*c^3*arctan(a*x)*polylog(2,-1+
2/(1-I*a*x))+6/5*I*a*c^3*arctan(a*x)^3+3/2*a*c^3*polylog(3,-1+2/(1-I*a*x))+
33/10*a*c^3*polylog(3,1-2/(1+I*a*x))
```

Rubi [A] time = 1.28, antiderivative size = 354, normalized size of antiderivative = 1.00, number of steps used = 45, number of rules used = 15, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.682, Rules used = {4948, 4846, 4920, 4854, 4884, 4994, 6610, 4852, 4924, 4868, 4992, 4916, 260, 266, 43}

$$\frac{3}{2}ac^3\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)+\frac{33}{10}ac^3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)-3iac^3\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)+\frac{33}{5}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] -(a^3*c^3*x^2)/20 + (21*a^2*c^3*x*ArcTan[a*x])/10 + (a^4*c^3*x^3*ArcTan[a*x
])/10 - (21*a*c^3*ArcTan[a*x]^2)/20 - (6*a^3*c^3*x^2*ArcTan[a*x]^2)/5 - (3*
a^5*c^3*x^4*ArcTan[a*x]^2)/20 + ((6*I)/5)*a*c^3*ArcTan[a*x]^3 - (c^3*ArcTan
[a*x]^3)/x + 3*a^2*c^3*x*ArcTan[a*x]^3 + a^4*c^3*x^3*ArcTan[a*x]^3 + (a^6*c
^3*x^5*ArcTan[a*x]^3)/5 + (33*a*c^3*ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/5 - a
*c^3*Log[1 + a^2*x^2] + 3*a*c^3*ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)] - (3*I
)*a*c^3*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)] + ((33*I)/5)*a*c^3*ArcTa
n[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)] + (3*a*c^3*PolyLog[3, -1 + 2/(1 - I*a*
x)])/2 + (33*a*c^3*PolyLog[3, 1 - 2/(1 + I*a*x)])/10
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}{x^2}\,dx = \int \left(3a^2c^3\tan^{-1}(ax)^3 + \frac{c^3\tan^{-1}(ax)^3}{x^2} + 3a^4c^3x^2\tan^{-1}(ax)^3 + a^6c^3x^4\tan^{-1}(ax)^3\right)$$

$$= c^3\int \frac{\tan^{-1}(ax)^3}{x^2}\,dx + \left(3a^2c^3\right)\int \tan^{-1}(ax)^3\,dx + \left(3a^4c^3\right)\int x^2\tan^{-1}(ax)^3\,dx + ($$

$$= -\frac{c^3\tan^{-1}(ax)^3}{x} + 3a^2c^3x\tan^{-1}(ax)^3 + a^4c^3x^3\tan^{-1}(ax)^3 + \frac{1}{5}a^6c^3x^5\tan^{-1}(ax)^3 +$$

$$= 2iac^3\tan^{-1}(ax)^3 - \frac{c^3\tan^{-1}(ax)^3}{x} + 3a^2c^3x\tan^{-1}(ax)^3 + a^4c^3x^3\tan^{-1}(ax)^3 + \frac{1}{5}a^6$$

$$= -\frac{3}{2}a^3c^3x^2\tan^{-1}(ax)^2 - \frac{3}{20}a^5c^3x^4\tan^{-1}(ax)^2 + iac^3\tan^{-1}(ax)^3 - \frac{c^3\tan^{-1}(ax)^3}{x} +$$

$$= -\frac{6}{5}a^3c^3x^2\tan^{-1}(ax)^2 - \frac{3}{20}a^5c^3x^4\tan^{-1}(ax)^2 + \frac{6}{5}iac^3\tan^{-1}(ax)^3 - \frac{c^3\tan^{-1}(ax)^3}{x}$$

$$= 3a^2c^3x\tan^{-1}(ax) + \frac{1}{10}a^4c^3x^3\tan^{-1}(ax) - \frac{3}{2}ac^3\tan^{-1}(ax)^2 - \frac{6}{5}a^3c^3x^2\tan^{-1}(ax)^2$$

$$= \frac{21}{10}a^2c^3x\tan^{-1}(ax) + \frac{1}{10}a^4c^3x^3\tan^{-1}(ax) - \frac{21}{20}ac^3\tan^{-1}(ax)^2 - \frac{6}{5}a^3c^3x^2\tan^{-1}(a$$

$$= \frac{21}{10}a^2c^3x\tan^{-1}(ax) + \frac{1}{10}a^4c^3x^3\tan^{-1}(ax) - \frac{21}{20}ac^3\tan^{-1}(ax)^2 - \frac{6}{5}a^3c^3x^2\tan^{-1}(a$$

$$= -\frac{1}{20}a^3c^3x^2 + \frac{21}{10}a^2c^3x\tan^{-1}(ax) + \frac{1}{10}a^4c^3x^3\tan^{-1}(ax) - \frac{21}{20}ac^3\tan^{-1}(ax)^2 - \frac{6}{5}a$$

Mathematica [A] time = 0.77, size = 298, normalized size = 0.84

$$c^3\left(8a^6x^6\tan^{-1}(ax)^3 - 6a^5x^5\tan^{-1}(ax)^2 + 40a^4x^4\tan^{-1}(ax)^3 + 4a^4x^4\tan^{-1}(ax) - 2a^3x^3 - 48a^3x^3\tan^{-1}(ax)^2 - 4$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] (c^3*(-2*a*x - (5*I)*a*Pi^3*x - 2*a^3*x^3 + 84*a^2*x^2*ArcTan[a*x] + 4*a^4*
x^4*ArcTan[a*x] - 42*a*x*ArcTan[a*x]^2 - 48*a^3*x^3*ArcTan[a*x]^2 - 6*a^5*x
^5*ArcTan[a*x]^2 - 40*ArcTan[a*x]^3 - (48*I)*a*x*ArcTan[a*x]^3 + 120*a^2*x^
2*ArcTan[a*x]^3 + 40*a^4*x^4*ArcTan[a*x]^3 + 8*a^6*x^6*ArcTan[a*x]^3 + 120*
a*x*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + 264*a*x*ArcTan[a*x]^2*L
og[1 + E^((2*I)*ArcTan[a*x])] - 40*a*x*Log[1 + a^2*x^2] + (120*I)*a*x*ArcTa
n[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] - (264*I)*a*x*ArcTan[a*x]*PolyLog
[2, -E^((2*I)*ArcTan[a*x])] + 60*a*x*PolyLog[3, E^((-2*I)*ArcTan[a*x])] + 1
32*a*x*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/(40*x)
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^{6} c^{3} x^{6} + 3 \, a^{4} c^{3} x^{4} + 3 \, a^{2} c^{3} x^{2} + c^{3}\right) \arctan\left(a x\right)^{3}}{x^{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^3/
x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 13.82, size = 10139, normalized size = 28.64

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^3/x^2,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x^2,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int 3a^{2}\operatorname{atan}^{3}(ax)\,dx+\int\frac{\operatorname{atan}^{3}(ax)}{x^{2}}\,dx+\int 3a^{4}x^{2}\operatorname{atan}^{3}(ax)\,dx+\int a^{6}x^{4}\operatorname{atan}^{3}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**3/x**2,x)
```

```
[Out] c**3*(Integral(3*a**2*atan(a*x)**3, x) + Integral(atan(a*x)**3/x**2, x) + I
ntegral(3*a**4*x**2*atan(a*x)**3, x) + Integral(a**6*x**4*atan(a*x)**3, x))
```

3.385 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^3}{x^3} dx$

Optimal. Leaf size=503

$$\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)^3-\frac{1}{4}a^5c^3x^3\tan^{-1}(ax)^2+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)^3+\frac{1}{4}a^4c^3x^2\tan^{-1}(ax)-\frac{1}{4}a^3c^3x-\frac{15}{4}a^3c^3x\tan^{-1}(ax)$$

```
[Out] -1/4*a^3*c^3*x+1/4*a^2*c^3*arctan(a*x)+1/4*a^4*c^3*x^2*arctan(a*x)-3/2*I*a^
2*c^3*polylog(2,-1+2/(1-I*a*x))-3/2*a*c^3*arctan(a*x)^2/x-15/4*a^3*c^3*x*ar
ctan(a*x)^2-1/4*a^5*c^3*x^3*arctan(a*x)^2+3/4*a^2*c^3*arctan(a*x)^3-1/2*c^3
*arctan(a*x)^3/x^2+3/2*a^4*c^3*x^2*arctan(a*x)^3+1/4*a^6*c^3*x^4*arctan(a*x
)^3-6*a^2*c^3*arctan(a*x)^3*arctanh(-1+2/(1+I*a*x))-7*a^2*c^3*arctan(a*x)*l
n(2/(1+I*a*x))+3*a^2*c^3*arctan(a*x)*ln(2-2/(1-I*a*x))-7/2*I*a^2*c^3*polylo
g(2,1-2/(1+I*a*x))-5*I*a^2*c^3*arctan(a*x)^2-9/2*I*a^2*c^3*arctan(a*x)^2*po
lylog(2,1-2/(1+I*a*x))+9/4*I*a^2*c^3*polylog(4,1-2/(1+I*a*x))-9/2*a^2*c^3*a
rctan(a*x)*polylog(3,1-2/(1+I*a*x))+9/2*a^2*c^3*arctan(a*x)*polylog(3,-1+2/
(1+I*a*x))-9/4*I*a^2*c^3*polylog(4,-1+2/(1+I*a*x))+9/2*I*a^2*c^3*arctan(a*x
)^2*polylog(2,-1+2/(1+I*a*x))
```

Rubi [A] time = 1.19, antiderivative size = 503, normalized size of antiderivative = 1.00, number of steps used = 43, number of rules used = 20, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.909, Rules used = {4948, 4852, 4918, 4924, 4868, 2447, 4884, 4850, 4988, 4994, 4998, 6610, 4916, 4846, 4920, 4854, 2402, 2315, 321, 203}

$$-\frac{3}{2}ia^2c^3\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-\frac{7}{2}ia^2c^3\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)+\frac{9}{4}ia^2c^3\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)-\frac{9}{4}ia^2c^3$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] -(a^3*c^3*x)/4 + (a^2*c^3*ArcTan[a*x])/4 + (a^4*c^3*x^2*ArcTan[a*x])/4 - (5
*I)*a^2*c^3*ArcTan[a*x]^2 - (3*a*c^3*ArcTan[a*x]^2)/(2*x) - (15*a^3*c^3*x*A
rcTan[a*x]^2)/4 - (a^5*c^3*x^3*ArcTan[a*x]^2)/4 + (3*a^2*c^3*ArcTan[a*x]^3)
/4 - (c^3*ArcTan[a*x]^3)/(2*x^2) + (3*a^4*c^3*x^2*ArcTan[a*x]^3)/2 + (a^6*c
^3*x^4*ArcTan[a*x]^3)/4 + 6*a^2*c^3*ArcTan[a*x]^3*ArcTanh[1 - 2/(1 + I*a*x)
] - 7*a^2*c^3*ArcTan[a*x]*Log[2/(1 + I*a*x)] + 3*a^2*c^3*ArcTan[a*x]*Log[2
- 2/(1 - I*a*x)] - ((3*I)/2)*a^2*c^3*PolyLog[2, -1 + 2/(1 - I*a*x)] - ((7*I
)/2)*a^2*c^3*PolyLog[2, 1 - 2/(1 + I*a*x)] - ((9*I)/2)*a^2*c^3*ArcTan[a*x]^
2*PolyLog[2, 1 - 2/(1 + I*a*x)] + ((9*I)/2)*a^2*c^3*ArcTan[a*x]^2*PolyLog[2
, -1 + 2/(1 + I*a*x)] - (9*a^2*c^3*ArcTan[a*x]*PolyLog[3, 1 - 2/(1 + I*a*x)
])/2 + (9*a^2*c^3*ArcTan[a*x]*PolyLog[3, -1 + 2/(1 + I*a*x)])/2 + ((9*I)/4)
*a^2*c^3*PolyLog[4, 1 - 2/(1 + I*a*x)] - ((9*I)/4)*a^2*c^3*PolyLog[4, -1 +
2/(1 + I*a*x)]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}{x^3}\,dx = \int \left(\frac{c^3\tan^{-1}(ax)^3}{x^3}+\frac{3a^2c^3\tan^{-1}(ax)^3}{x}+3a^4c^3x\tan^{-1}(ax)^3+a^6c^3x^3\tan^{-1}(ax)^3\right)$$

$$= c^3\int \frac{\tan^{-1}(ax)^3}{x^3}\,dx+\left(3a^2c^3\right)\int \frac{\tan^{-1}(ax)^3}{x}\,dx+\left(3a^4c^3\right)\int x\tan^{-1}(ax)^3\,dx+($$

$$= -\frac{c^3\tan^{-1}(ax)^3}{2x^2}+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)^3+\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)^3+6a^2c^3\tan^{-1}(ax)^3\,\mathrm{t}$$

$$= -\frac{c^3\tan^{-1}(ax)^3}{2x^2}+\frac{3}{2}a^4c^3x^2\tan^{-1}(ax)^3+\frac{1}{4}a^6c^3x^4\tan^{-1}(ax)^3+6a^2c^3\tan^{-1}(ax)^3\,\mathrm{t}$$

$$= -\frac{3ac^3\tan^{-1}(ax)^2}{2x}-\frac{9}{2}a^3c^3x\tan^{-1}(ax)^2-\frac{1}{4}a^5c^3x^3\tan^{-1}(ax)^2+a^2c^3\tan^{-1}(ax)^3-$$

$$= -6ia^2c^3\tan^{-1}(ax)^2-\frac{3ac^3\tan^{-1}(ax)^2}{2x}-\frac{15}{4}a^3c^3x\tan^{-1}(ax)^2-\frac{1}{4}a^5c^3x^3\tan^{-1}(ax$$

$$= \frac{1}{4}a^4c^3x^2\tan^{-1}(ax)-5ia^2c^3\tan^{-1}(ax)^2-\frac{3ac^3\tan^{-1}(ax)^2}{2x}-\frac{15}{4}a^3c^3x\tan^{-1}(ax)^2-$$

$$= -\frac{1}{4}a^3c^3x+\frac{1}{4}a^4c^3x^2\tan^{-1}(ax)-5ia^2c^3\tan^{-1}(ax)^2-\frac{3ac^3\tan^{-1}(ax)^2}{2x}-\frac{15}{4}a^3c^3x$$

$$= -\frac{1}{4}a^3c^3x+\frac{1}{4}a^2c^3\tan^{-1}(ax)+\frac{1}{4}a^4c^3x^2\tan^{-1}(ax)-5ia^2c^3\tan^{-1}(ax)^2-\frac{3ac^3\tan}{2x}$$

$$= -\frac{1}{4}a^3c^3x+\frac{1}{4}a^2c^3\tan^{-1}(ax)+\frac{1}{4}a^4c^3x^2\tan^{-1}(ax)-5ia^2c^3\tan^{-1}(ax)^2-\frac{3ac^3\tan}{2x}$$

Mathematica [A] time = 0.78, size = 464, normalized size = 0.92

$$\frac{c^3\left(16a^6x^6\tan^{-1}(ax)^3-16a^5x^5\tan^{-1}(ax)^2+96a^4x^4\tan^{-1}(ax)^3+16a^4x^4\tan^{-1}(ax)-16a^3x^3-240a^3x^3\tan^{-1}(ax\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (c^3*((-3*I)*a^2*Pi^4*x^2 - 16*a^3*x^3 + 16*a^2*x^2*ArcTan[a*x] + 16*a^4*x^
4*ArcTan[a*x] - 96*a*x*ArcTan[a*x]^2 + (128*I)*a^2*x^2*ArcTan[a*x]^2 - 240*
a^3*x^3*ArcTan[a*x]^2 - 16*a^5*x^5*ArcTan[a*x]^2 - 32*ArcTan[a*x]^3 + 48*a^
2*x^2*ArcTan[a*x]^3 + 96*a^4*x^4*ArcTan[a*x]^3 + 16*a^6*x^6*ArcTan[a*x]^3 +
 (96*I)*a^2*x^2*ArcTan[a*x]^4 + 192*a^2*x^2*ArcTan[a*x]^3*Log[1 - E^((-2*I)
*ArcTan[a*x])] + 192*a^2*x^2*ArcTan[a*x]*Log[1 - E^((2*I)*ArcTan[a*x])] - 4
48*a^2*x^2*ArcTan[a*x]*Log[1 + E^((2*I)*ArcTan[a*x])] - 192*a^2*x^2*ArcTan[
a*x]^3*Log[1 + E^((2*I)*ArcTan[a*x])] + (288*I)*a^2*x^2*ArcTan[a*x]^2*PolyL
og[2, E^((-2*I)*ArcTan[a*x])] + (32*I)*a^2*x^2*(7 + 9*ArcTan[a*x]^2)*PolyLo
g[2, -E^((2*I)*ArcTan[a*x])] - (96*I)*a^2*x^2*PolyLog[2, E^((2*I)*ArcTan[a*
x])] + 288*a^2*x^2*ArcTan[a*x]*PolyLog[3, E^((-2*I)*ArcTan[a*x])] - 288*a^2
```

```
*x^2*ArcTan[a*x]*PolyLog[3, -E^((2*I)*ArcTan[a*x])] - (144*I)*a^2*x^2*PolyL
og[4, E^((-2*I)*ArcTan[a*x])] - (144*I)*a^2*x^2*PolyLog[4, -E^((2*I)*ArcTan
[a*x])]))/(64*x^2)
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3\right)\arctan\left(ax\right)^3}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^3/
x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 21.30, size = 790, normalized size = 1.57

$$\frac{9ia^2c^3\arctan\left(ax\right)^2\operatorname{polylog}\left(2, -\frac{(iax+1)^2}{a^2x^2+1}\right)}{2} - 9ia^2c^3\arctan\left(ax\right)^2\operatorname{polylog}\left(2, -\frac{iax+1}{\sqrt{a^2x^2+1}}\right) - 9ia^2c^3\arctan\left(ax\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^3/x^3,x)
```

```
[Out] -1/4*a^3*c^3*x+1/4*a^2*c^3*arctan(a*x)+9/2*I*a^2*c^3*arctan(a*x)^2*polylog(
2,-(1+I*a*x)^2/(a^2*x^2+1))+3/4*a^2*c^3*arctan(a*x)^3-1/2*c^3*arctan(a*x)^3
/x^2-9*I*a^2*c^3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-9*I*
a^2*c^3*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-3/2*a*c^3*arct
an(a*x)^2/x-15/4*a^3*c^3*x*arctan(a*x)^2-1/4*a^5*c^3*x^3*arctan(a*x)^2+3/2*
a^4*c^3*x^2*arctan(a*x)^3+1/4*a^6*c^3*x^4*arctan(a*x)^3+1/4*a^4*c^3*x^2*arc
tan(a*x)+3*a^2*c^3*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*a^2*c^3*
arctan(a*x)^3*ln((1+I*a*x)^2/(a^2*x^2+1)+1)+3*a^2*c^3*arctan(a*x)^3*ln(1+(1
+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2*c^3*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)
^(1/2))+18*a^2*c^3*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+18*I
*a^2*c^3*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-9/4*I*a^2*c^3*polylog(4,-(
1+I*a*x)^2/(a^2*x^2+1))+2*I*a^2*c^3*arctan(a*x)^2+18*I*a^2*c^3*polylog(4,(1
+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*a^2*c^3*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2
))-3*I*a^2*c^3*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+7/2*I*a^2*c^3*polylo
g(2,-(1+I*a*x)^2/(a^2*x^2+1))+3*a^2*c^3*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x
^2+1)^(1/2))+18*a^2*c^3*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-
7*a^2*c^3*arctan(a*x)*ln((1+I*a*x)^2/(a^2*x^2+1)+1)-9/2*a^2*c^3*arctan(a*x)
*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-1/4*I*a^2*c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{4\left(a^6c^3x^6 + 6\,a^4c^3x^4 - 2\,c^3\right)\arctan\left(ax\right)^3 - 3\left(a^6c^3x^6 + 6\,a^4c^3x^4 - 2\,c^3\right)\arctan\left(ax\right)\log\left(a^2x^2+1\right)^2 + x^2\int \frac{112(}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^3,x, algorithm="maxima")
```

```
[Out] 1/128*(4*(a^6*c^3*x^6 + 6*a^4*c^3*x^4 - 2*c^3)*arctan(a*x)^3 - 3*(a^6*c^3*x
^6 + 6*a^4*c^3*x^4 - 2*c^3)*arctan(a*x)*log(a^2*x^2 + 1)^2 + 128*x^2*integr
ate(1/128*(112*(a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2
 + c^3)*arctan(a*x)^3 - 12*(a^7*c^3*x^7 + 6*a^5*c^3*x^5 - 2*a*c^3*x)*arctan
(a*x)^2 + 12*(a^8*c^3*x^8 + 6*a^6*c^3*x^6 - 2*a^2*c^3*x^2)*arctan(a*x)*log(
a^2*x^2 + 1) + 3*(a^7*c^3*x^7 + 6*a^5*c^3*x^5 - 2*a*c^3*x + 4*(a^8*c^3*x^8
+ 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2 + c^3)*arctan(a*x))*log(a^2
*x^2 + 1)^2)/(a^2*x^5 + x^3), x))/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3}{x^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x^3,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{\operatorname{atan}^{3}{\left(ax \right)}}{x^{3}}\, dx + \int \frac{3a^{2}\operatorname{atan}^{3}{\left(ax \right)}}{x}\, dx + \int 3a^{4}x\operatorname{atan}^{3}{\left(ax \right)}\, dx + \int a^{6}x^{3}\operatorname{atan}^{3}{\left(ax \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**3/x**3,x)
```

```
[Out] c**3*(Integral(atan(a*x)**3/x**3, x) + Integral(3*a**2*atan(a*x)**3/x, x) +
 Integral(3*a**4*x*atan(a*x)**3, x) + Integral(a**6*x**3*atan(a*x)**3, x))
```

3.386 $\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}{x^4}\,dx$

Optimal. Leaf size=336

$$\frac{1}{3}a^6c^3x^3\tan^{-1}(ax)^3-\frac{1}{2}a^5c^3x^2\tan^{-1}(ax)^2+3a^4c^3x\tan^{-1}(ax)^3+a^4c^3x\tan^{-1}(ax)+4a^3c^3\text{Li}_3\left(\frac{2}{1-iax}-1\right)+4a^3c^3\text{L}$$

```
[Out] -a^2*c^3*arctan(a*x)/x+a^4*c^3*x*arctan(a*x)-a^3*c^3*arctan(a*x)^2-1/2*a*c^
3*arctan(a*x)^2/x^2-1/2*a^5*c^3*x^2*arctan(a*x)^2-1/3*c^3*arctan(a*x)^3/x^3
-3*a^2*c^3*arctan(a*x)^3/x+3*a^4*c^3*x*arctan(a*x)^3+1/3*a^6*c^3*x^3*arctan
(a*x)^3+a^3*c^3*ln(x)+8*a^3*c^3*arctan(a*x)^2*ln(2/(1+I*a*x))-a^3*c^3*ln(a^
2*x^2+1)+8*a^3*c^3*arctan(a*x)^2*ln(2-2/(1-I*a*x))+8*I*a^3*c^3*arctan(a*x)*
polylog(2,1-2/(1+I*a*x))-8*I*a^3*c^3*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))+
4*a^3*c^3*polylog(3,-1+2/(1-I*a*x))+4*a^3*c^3*polylog(3,1-2/(1+I*a*x))
```

Rubi [A] time = 1.11, antiderivative size = 336, normalized size of antiderivative = 1.00, number of steps used = 37, number of rules used = 18, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.818, Rules used = {4948, 4846, 4920, 4854, 4884, 4994, 6610, 4852, 4918, 266, 36, 29, 31, 4924, 4868, 4992, 4916, 260}

$$4a^3c^3\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)+4a^3c^3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)-8ia^3c^3\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)-$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] -((a^2*c^3*ArcTan[a*x])/x) + a^4*c^3*x*ArcTan[a*x] - a^3*c^3*ArcTan[a*x]^2
- (a*c^3*ArcTan[a*x]^2)/(2*x^2) - (a^5*c^3*x^2*ArcTan[a*x]^2)/2 - (c^3*ArcT
an[a*x]^3)/(3*x^3) - (3*a^2*c^3*ArcTan[a*x]^3)/x + 3*a^4*c^3*x*ArcTan[a*x]^
3 + (a^6*c^3*x^3*ArcTan[a*x]^3)/3 + a^3*c^3*Log[x] + 8*a^3*c^3*ArcTan[a*x]^
2*Log[2/(1 + I*a*x)] - a^3*c^3*Log[1 + a^2*x^2] + 8*a^3*c^3*ArcTan[a*x]^2*L
og[2 - 2/(1 - I*a*x)] - (8*I)*a^3*c^3*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*
a*x)] + (8*I)*a^3*c^3*ArcTan[a*x]*PolyLog[2, 1 - 2/(1 + I*a*x)] + 4*a^3*c^3
*PolyLog[3, -1 + 2/(1 - I*a*x)] + 4*a^3*c^3*PolyLog[3, 1 - 2/(1 + I*a*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4948

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*(a +
 b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*
d] && IGtQ[p, 0] && IGtQ[q, 1] && (EqQ[p, 1] || IntegerQ[m])
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^3}{x^4} dx = \int \left(3a^4c^3 \tan^{-1}(ax)^3 + \frac{c^3 \tan^{-1}(ax)^3}{x^4} + \frac{3a^2c^3 \tan^{-1}(ax)^3}{x^2} + a^6c^3x^2 \tan^{-1}(ax)^3\right) c$$

$$= c^3 \int \frac{\tan^{-1}(ax)^3}{x^4} dx + (3a^2c^3) \int \frac{\tan^{-1}(ax)^3}{x^2} dx + (3a^4c^3) \int \tan^{-1}(ax)^3 dx + (a^6$$

$$= -\frac{c^3 \tan^{-1}(ax)^3}{3x^3} - \frac{3a^2c^3 \tan^{-1}(ax)^3}{x} + 3a^4c^3x \tan^{-1}(ax)^3 + \frac{1}{3}a^6c^3x^3 \tan^{-1}(ax)^3 +$$

$$= -\frac{c^3 \tan^{-1}(ax)^3}{3x^3} - \frac{3a^2c^3 \tan^{-1}(ax)^3}{x} + 3a^4c^3x \tan^{-1}(ax)^3 + \frac{1}{3}a^6c^3x^3 \tan^{-1}(ax)^3 +$$

$$= -\frac{ac^3 \tan^{-1}(ax)^2}{2x^2} - \frac{1}{2}a^5c^3x^2 \tan^{-1}(ax)^2 - \frac{c^3 \tan^{-1}(ax)^3}{3x^3} - \frac{3a^2c^3 \tan^{-1}(ax)^3}{x} + 3a^4$$

$$= -\frac{ac^3 \tan^{-1}(ax)^2}{2x^2} - \frac{1}{2}a^5c^3x^2 \tan^{-1}(ax)^2 - \frac{c^3 \tan^{-1}(ax)^3}{3x^3} - \frac{3a^2c^3 \tan^{-1}(ax)^3}{x} + 3a^4$$

$$= -\frac{a^2c^3 \tan^{-1}(ax)}{x} + a^4c^3x \tan^{-1}(ax) - a^3c^3 \tan^{-1}(ax)^2 - \frac{ac^3 \tan^{-1}(ax)^2}{2x^2} - \frac{1}{2}a^5c^3x$$

$$= -\frac{a^2c^3 \tan^{-1}(ax)}{x} + a^4c^3x \tan^{-1}(ax) - a^3c^3 \tan^{-1}(ax)^2 - \frac{ac^3 \tan^{-1}(ax)^2}{2x^2} - \frac{1}{2}a^5c^3x$$

$$= -\frac{a^2c^3 \tan^{-1}(ax)}{x} + a^4c^3x \tan^{-1}(ax) - a^3c^3 \tan^{-1}(ax)^2 - \frac{ac^3 \tan^{-1}(ax)^2}{2x^2} - \frac{1}{2}a^5c^3x$$

$$= -\frac{a^2c^3 \tan^{-1}(ax)}{x} + a^4c^3x \tan^{-1}(ax) - a^3c^3 \tan^{-1}(ax)^2 - \frac{ac^3 \tan^{-1}(ax)^2}{2x^2} - \frac{1}{2}a^5c^3x$$

Mathematica [A] time = 0.74, size = 331, normalized size = 0.99

$$\frac{c^3 \left(2a^6x^6 \tan^{-1}(ax)^3 - 3a^5x^5 \tan^{-1}(ax)^2 + 18a^4x^4 \tan^{-1}(ax)^3 + 6a^4x^4 \tan^{-1}(ax) + 48ia^3x^3 \tan^{-1}(ax) \text{Li}_2\left(e^{-2i \tan^{-1}}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] (c^3*((-2*I)*a^3*Pi^3*x^3 - 6*a^2*x^2*ArcTan[a*x] + 6*a^4*x^4*ArcTan[a*x] -
 3*a*x*ArcTan[a*x]^2 - 6*a^3*x^3*ArcTan[a*x]^2 - 3*a^5*x^5*ArcTan[a*x]^2 -
2*ArcTan[a*x]^3 - 18*a^2*x^2*ArcTan[a*x]^3 + 18*a^4*x^4*ArcTan[a*x]^3 + 2*a
^6*x^6*ArcTan[a*x]^3 + 48*a^3*x^3*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*
x])] + 48*a^3*x^3*ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] + 6*a^3*x^3*
Log[(a*x)/Sqrt[1 + a^2*x^2]] - 3*a^3*x^3*Log[1 + a^2*x^2] + (48*I)*a^3*x^3*
ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] - (48*I)*a^3*x^3*ArcTan[a*x]
*PolyLog[2, -E^((2*I)*ArcTan[a*x])] + 24*a^3*x^3*PolyLog[3, E^((-2*I)*ArcTa
n[a*x])] + 24*a^3*x^3*PolyLog[3, -E^((2*I)*ArcTan[a*x])]))/(6*x^3)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3) \arctan(ax)^3}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^3/
x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^4,x, algorithm="giac")
[Out] Timed out
```

maple [C] time = 11.11, size = 7948, normalized size = 23.65

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^3/x^4,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^3/x^4,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x^4,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^3)/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int 3 a^{4} \operatorname{atan}^{3}{\left(a x \right)}\, dx + \int \frac{\operatorname{atan}^{3}{\left(a x \right)}}{x^{4}}\, dx + \int \frac{3 a^{2} \operatorname{atan}^{3}{\left(a x \right)}}{x^{2}}\, dx + \int a^{6} x^{2} \operatorname{atan}^{3}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**3/x**4,x)
[Out] c**3*(Integral(3*a**4*atan(a*x)**3, x) + Integral(atan(a*x)**3/x**4, x) + I
ntegral(3*a**2*atan(a*x)**3/x**2, x) + Integral(a**6*x**2*atan(a*x)**3, x))
```

3.387 $\int \frac{x^4 \tan^{-1}(ax)^3}{c+a^2cx^2}\,dx$

Optimal. Leaf size=217

$$-\frac{2\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{a^5c}-\frac{4i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{a^5c}+\frac{\tan^{-1}(ax)^4}{4a^5c}-\frac{4i\tan^{-1}(ax)^3}{3a^5c}-\frac{\tan^{-1}(ax)^2}{2a^5c}-\frac{4\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^2}{a^5c}$$

```
[Out] x*arctan(a*x)/a^4/c-1/2*arctan(a*x)^2/a^5/c-1/2*x^2*arctan(a*x)^2/a^3/c-4/3
*I*arctan(a*x)^3/a^5/c-x*arctan(a*x)^3/a^4/c+1/3*x^3*arctan(a*x)^3/a^2/c+1/
4*arctan(a*x)^4/a^5/c-4*arctan(a*x)^2*ln(2/(1+I*a*x))/a^5/c-1/2*ln(a^2*x^2+
1)/a^5/c-4*I*arctan(a*x)*polylog(2,1-2/(1+I*a*x))/a^5/c-2*polylog(3,1-2/(1+
I*a*x))/a^5/c
```

Rubi [A] time = 0.63, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.409$, Rules used = {4916, 4852, 4846, 260, 4884, 4920, 4854, 4994, 6610}

$$-\frac{2\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{a^5c}-\frac{4i\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^5c}-\frac{\log\left(a^2x^2+1\right)}{2a^5c}+\frac{x^3\tan^{-1}(ax)^3}{3a^2c}-\frac{x^2\tan^{-1}(ax)^2}{2a^3c}+$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] (x*ArcTan[a*x])/(a^4*c) - ArcTan[a*x]^2/(2*a^5*c) - (x^2*ArcTan[a*x]^2)/(2*
a^3*c) - (((4*I)/3)*ArcTan[a*x]^3)/(a^5*c) - (x*ArcTan[a*x]^3)/(a^4*c) + (x
^3*ArcTan[a*x]^3)/(3*a^2*c) + ArcTan[a*x]^4/(4*a^5*c) - (4*ArcTan[a*x]^2*Lo
g[2/(1 + I*a*x)])/(a^5*c) - Log[1 + a^2*x^2]/(2*a^5*c) - ((4*I)*ArcTan[a*x]
*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^5*c) - (2*PolyLog[3, 1 - 2/(1 + I*a*x)])
/(a^5*c)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^3}{c+a^2cx^2}\,dx = -\frac{\int \frac{x^2\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx}{a^2}+\frac{\int x^2\tan^{-1}(ax)^3\,dx}{a^2c}$$

$$= \frac{x^3\tan^{-1}(ax)^3}{3a^2c}+\frac{\int \frac{\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx}{a^4}-\frac{\int \tan^{-1}(ax)^3\,dx}{a^4c}-\frac{\int \frac{x^3\tan^{-1}(ax)^2}{1+a^2x^2}\,dx}{ac}$$

$$= -\frac{x\tan^{-1}(ax)^3}{a^4c}+\frac{x^3\tan^{-1}(ax)^3}{3a^2c}+\frac{\tan^{-1}(ax)^4}{4a^5c}-\frac{\int x\tan^{-1}(ax)^2\,dx}{a^3c}+\frac{\int \frac{x\tan^{-1}(ax)^2}{1+a^2x^2}\,dx}{a^3c}+$$

$$= -\frac{x^2\tan^{-1}(ax)^2}{2a^3c}-\frac{4i\tan^{-1}(ax)^3}{3a^5c}-\frac{x\tan^{-1}(ax)^3}{a^4c}+\frac{x^3\tan^{-1}(ax)^3}{3a^2c}+\frac{\tan^{-1}(ax)^4}{4a^5c}-$$

$$= -\frac{x^2\tan^{-1}(ax)^2}{2a^3c}-\frac{4i\tan^{-1}(ax)^3}{3a^5c}-\frac{x\tan^{-1}(ax)^3}{a^4c}+\frac{x^3\tan^{-1}(ax)^3}{3a^2c}+\frac{\tan^{-1}(ax)^4}{4a^5c}-$$

$$= \frac{x\tan^{-1}(ax)}{a^4c}-\frac{\tan^{-1}(ax)^2}{2a^5c}-\frac{x^2\tan^{-1}(ax)^2}{2a^3c}-\frac{4i\tan^{-1}(ax)^3}{3a^5c}-\frac{x\tan^{-1}(ax)^3}{a^4c}+\frac{x^3\tan^{-1}(}{3a^2c}$$

$$= \frac{x\tan^{-1}(ax)}{a^4c}-\frac{\tan^{-1}(ax)^2}{2a^5c}-\frac{x^2\tan^{-1}(ax)^2}{2a^3c}-\frac{4i\tan^{-1}(ax)^3}{3a^5c}-\frac{x\tan^{-1}(ax)^3}{a^4c}+\frac{x^3\tan^{-1}(}{3a^2c}$$

Mathematica [A] time = 0.26, size = 154, normalized size = 0.71

$$4a^3x^3\tan^{-1}(ax)^3-6\log\left(a^2x^2+1\right)-6a^2x^2\tan^{-1}(ax)^2+48i\tan^{-1}(ax)\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right)-24\text{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] (12*a*x*ArcTan[a*x] - 6*ArcTan[a*x]^2 - 6*a^2*x^2*ArcTan[a*x]^2 + (16*I)*Ar
cTan[a*x]^3 - 12*a*x*ArcTan[a*x]^3 + 4*a^3*x^3*ArcTan[a*x]^3 + 3*ArcTan[a*x
]^4 - 48*ArcTan[a*x]^2*Log[1 + E^((2*I)*ArcTan[a*x])] - 6*Log[1 + a^2*x^2]
+ (48*I)*ArcTan[a*x]*PolyLog[2, -E^((2*I)*ArcTan[a*x])] - 24*PolyLog[3, -E^
((2*I)*ArcTan[a*x])])/(12*a^5*c)
```

fricas [F] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^4\arctan(ax)^3}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x^4*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 3.07, size = 1740, normalized size = 8.02

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^3/(a^2*c*x^2+c),x)
```

```
[Out] -1/2*arctan(a*x)^2/a^5/c+1/4*arctan(a*x)^4/a^5/c-1/2*x^2*arctan(a*x)^2/a^3/
c-x*arctan(a*x)^3/a^4/c+1/3*x^3*arctan(a*x)^3/a^2/c+I/a^5/c*csgn(I*(1+I*a*x
)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*arctan(a*x)^2*Pi+1/a
^5/c*ln((1+I*a*x)^2/(a^2*x^2+1)+1)-2/a^5/c*polylog(3,-(1+I*a*x)^2/(a^2*x^2+
1))-1/a^4/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)
^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*arctan(a*x)^2*Pi*x-I/a^5/c*arctan(a*x)
+4/3*I/a^5/c*arctan(a*x)^3-4/a^5/c*ln(2)*arctan(a*x)^2+2/a^5/c*arctan(a*x)^
2*ln(a^2*x^2+1)-4/a^5/c*arctan(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+1/a^4
/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+
1))*arctan(a*x)^2*Pi*x-1/2/a^4/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2*Pi*x+I/a^5/c*csgn(I*((1+I*a
*x)^2/(a^2*x^2+1)+1)^2)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2
*Pi+I/a^5/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)
^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)*arctan(a*x)^2*Pi+4*I/a^5/c*arctan(a*x)
*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+1/2/a^4/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+
1)^2+2*I*(1+I*a*x)^2/(a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*arc
tan(a*x)^2*Pi*x-2*I/a^5/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*Pi-I/a^5/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1
))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(a
*x)^2*Pi-I/a^5/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2*Pi-1/2*I/a^5/c*cs
gn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*a
rctan(a*x)^2*Pi-1/2*I/a^5/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^
2/(a^2*x^2+1)+I)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)+I)^2*arctan(a*x)^2*Pi+x*arc
```

```
tan(a*x)/a^4/c+1/2/a^4/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*a*x)^2/(
a^2*x^2+1)+I)^3*arctan(a*x)^2*Pi*x-1/2/a^4/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1
)+1)^2)^3*arctan(a*x)^2*Pi*x+I/a^5/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*arct
an(a*x)^2*Pi+I/a^5/c*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1
)+1)^2)^3*arctan(a*x)^2*Pi-1/2*I/a^5/c*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2
)^3*arctan(a*x)^2*Pi-1/2*I/a^5/c*csgn(I*(1+I*a*x)^4/(a^2*x^2+1)^2+2*I*(1+I*
a*x)^2/(a^2*x^2+1)+I)^3*arctan(a*x)^2*Pi+I/a^5/c*csgn(I*(1+I*a*x)^2/(a^2*x^
2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I/
((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^2*Pi
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\mathrm{atan}\left(a\,x\right)^3}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^3)/(c + a^2*c*x^2),x)
```

```
[Out] int((x^4*atan(a*x)^3)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4\,\mathrm{atan}^3\,(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**3/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**4*atan(a*x)**3/(a**2*x**2 + 1), x)/c
```

3.388 $\int \frac{x^3 \tan^{-1}(ax)^3}{c+a^2cx^2} dx$

Optimal. Leaf size=260

$$-\frac{3i\text{Li}_2\left(1-\frac{2}{iax+1}\right)}{2a^4c}-\frac{3i\text{Li}_4\left(1-\frac{2}{iax+1}\right)}{4a^4c}+\frac{3i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)^2}{2a^4c}+\frac{3\text{Li}_3\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{2a^4c}+\frac{i\tan^{-1}(ax)^4}{4a^4c}+\text{ta}$$

```
[Out] -3/2*I*arctan(a*x)^2/a^4/c-3/2*x*arctan(a*x)^2/a^3/c+1/2*arctan(a*x)^3/a^4/
c+1/2*x^2*arctan(a*x)^3/a^2/c+1/4*I*arctan(a*x)^4/a^4/c-3*arctan(a*x)*ln(2/
(1+I*a*x))/a^4/c+arctan(a*x)^3*ln(2/(1+I*a*x))/a^4/c-3/2*I*polylog(2,1-2/(1
+I*a*x))/a^4/c+3/2*I*arctan(a*x)^2*polylog(2,1-2/(1+I*a*x))/a^4/c+3/2*arcta
n(a*x)*polylog(3,1-2/(1+I*a*x))/a^4/c-3/4*I*polylog(4,1-2/(1+I*a*x))/a^4/c
```

Rubi [A] time = 0.45, antiderivative size = 260, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4916, 4852, 4846, 4920, 4854, 2402, 2315, 4884, 4994, 4998, 6610}

$$-\frac{3i\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^4c}-\frac{3i\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)}{4a^4c}+\frac{3i\tan^{-1}(ax)^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^4c}+\frac{3\tan^{-1}(ax)\text{PolyLog}}{2a^4c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] (((-3*I)/2)*ArcTan[a*x]^2)/(a^4*c) - (3*x*ArcTan[a*x]^2)/(2*a^3*c) + ArcTan
[a*x]^3/(2*a^4*c) + (x^2*ArcTan[a*x]^3)/(2*a^2*c) + ((I/4)*ArcTan[a*x]^4)/(
a^4*c) - (3*ArcTan[a*x]*Log[2/(1 + I*a*x)])/(a^4*c) + (ArcTan[a*x]^3*Log[2/
(1 + I*a*x)])/(a^4*c) - (((3*I)/2)*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^4*c) +
 (((3*I)/2)*ArcTan[a*x]^2*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^4*c) + (3*ArcTa
n[a*x]*PolyLog[3, 1 - 2/(1 + I*a*x)])/(2*a^4*c) - (((3*I)/4)*PolyLog[4, 1 -
 2/(1 + I*a*x)])/(a^4*c)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^3}{c+a^2cx^2} dx = -\frac{\int \frac{x \tan^{-1}(ax)^3}{c+a^2cx^2} dx}{a^2} + \frac{\int x \tan^{-1}(ax)^3 dx}{a^2c}$$
$$= \frac{x^2 \tan^{-1}(ax)^3}{2a^2c} + \frac{i \tan^{-1}(ax)^4}{4a^4c} + \frac{\int \frac{\tan^{-1}(ax)^3}{i-ax} dx}{a^3c} - \frac{3\int \frac{x^2 \tan^{-1}(ax)^2}{1+a^2x^2} dx}{2ac}$$
$$= \frac{x^2 \tan^{-1}(ax)^3}{2a^2c} + \frac{i \tan^{-1}(ax)^4}{4a^4c} + \frac{\tan^{-1}(ax)^3 \log\left(\frac{2}{1+iax}\right)}{a^4c} - \frac{3\int \tan^{-1}(ax)^2 dx}{2a^3c} + \frac{3\int \frac{\tan^{-1}(ax)^2}{1+a^2x^2}}{2a^3c}$$
$$= -\frac{3x \tan^{-1}(ax)^2}{2a^3c} + \frac{\tan^{-1}(ax)^3}{2a^4c} + \frac{x^2 \tan^{-1}(ax)^3}{2a^2c} + \frac{i \tan^{-1}(ax)^4}{4a^4c} + \frac{\tan^{-1}(ax)^3 \log\left(\frac{2}{1+iax}\right)}{a^4c} +$$
$$= -\frac{3i \tan^{-1}(ax)^2}{2a^4c} - \frac{3x \tan^{-1}(ax)^2}{2a^3c} + \frac{\tan^{-1}(ax)^3}{2a^4c} + \frac{x^2 \tan^{-1}(ax)^3}{2a^2c} + \frac{i \tan^{-1}(ax)^4}{4a^4c} + \frac{\tan^{-1}(ax)}{}$$
$$= -\frac{3i \tan^{-1}(ax)^2}{2a^4c} - \frac{3x \tan^{-1}(ax)^2}{2a^3c} + \frac{\tan^{-1}(ax)^3}{2a^4c} + \frac{x^2 \tan^{-1}(ax)^3}{2a^2c} + \frac{i \tan^{-1}(ax)^4}{4a^4c} - \frac{3\tan^{-1}(a}{}$$
$$= -\frac{3i \tan^{-1}(ax)^2}{2a^4c} - \frac{3x \tan^{-1}(ax)^2}{2a^3c} + \frac{\tan^{-1}(ax)^3}{2a^4c} + \frac{x^2 \tan^{-1}(ax)^3}{2a^2c} + \frac{i \tan^{-1}(ax)^4}{4a^4c} - \frac{3\tan^{-1}(a}{}$$
$$= -\frac{3i \tan^{-1}(ax)^2}{2a^4c} - \frac{3x \tan^{-1}(ax)^2}{2a^3c} + \frac{\tan^{-1}(ax)^3}{2a^4c} + \frac{x^2 \tan^{-1}(ax)^3}{2a^2c} + \frac{i \tan^{-1}(ax)^4}{4a^4c} - \frac{3\tan^{-1}(a}{}$$

Mathematica [A] time = 0.29, size = 162, normalized size = 0.62

$$\frac{2\left(a^2x^2+1\right)\tan^{-1}(ax)^3 + 6\tan^{-1}(ax)\text{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right) - 6i\left(\tan^{-1}(ax)^2-1\right)\text{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) + 3i\text{Li}_4\left(-e^{2i\tan^{-1}(}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] ((6*I)*ArcTan[a*x]^2 - 6*a*x*ArcTan[a*x]^2 + 2*(1 + a^2*x^2)*ArcTan[a*x]^3
- I*ArcTan[a*x]^4 - 12*ArcTan[a*x]*Log[1 + E^((2*I)*ArcTan[a*x])] + 4*ArcTa
n[a*x]^3*Log[1 + E^((2*I)*ArcTan[a*x])] - (6*I)*(-1 + ArcTan[a*x]^2)*PolyLo
g[2, -E^((2*I)*ArcTan[a*x])] + 6*ArcTan[a*x]*PolyLog[3, -E^((2*I)*ArcTan[a*
x])] + (3*I)*PolyLog[4, -E^((2*I)*ArcTan[a*x])])/(4*a^4*c)
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^3 \arctan(ax)^3}{a^2cx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x^3*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 8.53, size = 292, normalized size = 1.12

$$-\frac{i\arctan(ax)^4}{4a^4c}+\frac{x^2\arctan(ax)^3}{2a^2c}+\frac{\arctan(ax)^3}{2a^4c}-\frac{3x\arctan(ax)^2}{2a^3c}+\frac{3i\arctan(ax)^2}{2a^4c}+\frac{\arctan(ax)^3\ln\left(\frac{(iax+1)^2}{a^2x^2+1}+\right.}{a^4c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^3/(a^2*c*x^2+c),x)
```

```
[Out] -1/4*I/a^4/c*arctan(a*x)^4+1/2*x^2*arctan(a*x)^3/a^2/c+1/2*arctan(a*x)^3/a^
4/c-3/2*x*arctan(a*x)^2/a^3/c+3/2*I/a^4/c*arctan(a*x)^2+1/a^4/c*arctan(a*x)
^3*ln((1+I*a*x)^2/(a^2*x^2+1)+1)-3/2*I/a^4/c*arctan(a*x)^2*polylog(2,-(1+I*
a*x)^2/(a^2*x^2+1))+3/2/a^4/c*arctan(a*x)*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1
))+3/4*I/a^4/c*polylog(4,-(1+I*a*x)^2/(a^2*x^2+1))-3/a^4/c*arctan(a*x)*ln((
1+I*a*x)^2/(a^2*x^2+1)+1)+3/2*I/a^4/c*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\arctan(ax)^3}{a^2cx^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\mathrm{atan}(a\,x)^3}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2),x)
```

```
[Out] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3\,\mathrm{atan}^3(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**3/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**3*atan(a*x)**3/(a**2*x**2 + 1), x)/c
```

3.389 $\int \frac{x^2 \tan^{-1}(ax)^3}{c+a^2cx^2} \, dx$

Optimal. Leaf size=130

$$\frac{3\text{Li}_3\left(1-\frac{2}{iax+1}\right)}{2a^3c}+\frac{3i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{a^3c}-\frac{\tan^{-1}(ax)^4}{4a^3c}+\frac{i\tan^{-1}(ax)^3}{a^3c}+\frac{3\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^2}{a^3c}+\frac{x\tan^{-1}(ax)^3}{a^2c}$$

```
[Out] I*arctan(a*x)^3/a^3/c+x*arctan(a*x)^3/a^2/c-1/4*arctan(a*x)^4/a^3/c+3*arcta
n(a*x)^2*ln(2/(1+I*a*x))/a^3/c+3*I*arctan(a*x)*polylog(2,1-2/(1+I*a*x))/a^3
/c+3/2*polylog(3,1-2/(1+I*a*x))/a^3/c
```

Rubi [A] time = 0.25, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4916, 4846, 4920, 4854, 4884, 4994, 6610}

$$\frac{3\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^3c}+\frac{3i\tan^{-1}(ax)\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{a^3c}-\frac{\tan^{-1}(ax)^4}{4a^3c}+\frac{x\tan^{-1}(ax)^3}{a^2c}+\frac{i\tan^{-1}(ax)^3}{a^3c}+\frac{3\log\left(\frac{}{1+}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] (I*ArcTan[a*x]^3)/(a^3*c) + (x*ArcTan[a*x]^3)/(a^2*c) - ArcTan[a*x]^4/(4*a^
3*c) + (3*ArcTan[a*x]^2*Log[2/(1 + I*a*x)])/(a^3*c) + ((3*I)*ArcTan[a*x]*Po
lyLog[2, 1 - 2/(1 + I*a*x)])/(a^3*c) + (3*PolyLog[3, 1 - 2/(1 + I*a*x)])/(2
*a^3*c)
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^2\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx = -\frac{\int \frac{\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx}{a^2} + \frac{\int \tan^{-1}(ax)^3\,dx}{a^2c}$$
$$= \frac{x\tan^{-1}(ax)^3}{a^2c} - \frac{\tan^{-1}(ax)^4}{4a^3c} - \frac{3\int \frac{x\tan^{-1}(ax)^2}{1+a^2x^2}\,dx}{ac}$$
$$= \frac{i\tan^{-1}(ax)^3}{a^3c} + \frac{x\tan^{-1}(ax)^3}{a^2c} - \frac{\tan^{-1}(ax)^4}{4a^3c} + \frac{3\int \frac{\tan^{-1}(ax)^2}{i-ax}\,dx}{a^2c}$$
$$= \frac{i\tan^{-1}(ax)^3}{a^3c} + \frac{x\tan^{-1}(ax)^3}{a^2c} - \frac{\tan^{-1}(ax)^4}{4a^3c} + \frac{3\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^3c} - \frac{6\int \frac{\tan^{-1}(ax)\log(}{1+a^2x^2}}{a^2c}$$
$$= \frac{i\tan^{-1}(ax)^3}{a^3c} + \frac{x\tan^{-1}(ax)^3}{a^2c} - \frac{\tan^{-1}(ax)^4}{4a^3c} + \frac{3\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^3c} + \frac{3i\tan^{-1}(ax)\mathrm{Li}_2}{a^3c}$$
$$= \frac{i\tan^{-1}(ax)^3}{a^3c} + \frac{x\tan^{-1}(ax)^3}{a^2c} - \frac{\tan^{-1}(ax)^4}{4a^3c} + \frac{3\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{a^3c} + \frac{3i\tan^{-1}(ax)\mathrm{Li}_2}{a^3c}$$

Mathematica [A] time = 0.22, size = 93, normalized size = 0.72

$$\frac{-3i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) + \frac{3}{2}\mathrm{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right) - \frac{1}{4}\tan^{-1}(ax)^2\left(\tan^{-1}(ax)^2 + (-4ax+4i)\tan^{-1}(ax) - 12\right.}{a^3c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] (-1/4*(ArcTan[a*x]^2*((4*I - 4*a*x)*ArcTan[a*x] + ArcTan[a*x]^2 - 12*Log[1
+ E^((2*I)*ArcTan[a*x])])) - (3*I)*ArcTan[a*x]*PolyLog[2, -E^((2*I)*ArcTan[
a*x])] + (3*PolyLog[3, -E^((2*I)*ArcTan[a*x])])/2)/(a^3*c)
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^2\arctan(ax)^3}{a^2cx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x^2*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.54, size = 925, normalized size = 7.12

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^3/(a^2*c*x^2+c),x)
```

```
[Out] x*arctan(a*x)^3/a^2/c-1/4*arctan(a*x)^4/a^3/c-3/2/a^3/c*arctan(a*x)^2*ln(a^
2*x^2+1)+3/a^3/c*arctan(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-3/4*I/a^3/c*
arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)
^3*Pi+3/4*I/a^3/c*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(
I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*Pi+3/2*I/a^3/c*arctan(a*x)^2*csgn(I*(1+I*a
*x)^2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*Pi+3/4*I/a^3/c*arc
tan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/(
(1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*Pi-I/a^3/c*arctan(a*x)^3+3/4*I/a^3/c*arctan
(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*Pi-3/4*I/a^3/c*arctan(a*x)^
2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*Pi+3/4*I/a^3/c*arctan(a*x)^2*csgn(I/((1
+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^
2*x^2+1)+1)^2)^2*Pi-3/2*I/a^3/c*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+
1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*Pi-3*I/a^3/c*arctan(a*x)*pol
ylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+3/a^3/c*ln(2)*arctan(a*x)^2-3/4*I/a^3/c*ar
ctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x
^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*Pi+3/2
/a^3/c*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-3/4*I/a^3/c*arctan(a*x)^2*csgn(I
*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*Pi
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^3}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2),x)
```

```
[Out] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2} \operatorname{atan}^{3}{\left(a x \right)}}{a^{2} x^{2} + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**3/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**2*atan(a*x)**3/(a**2*x**2 + 1), x)/c
```

3.390 $\int \frac{x\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx$

Optimal. Leaf size=138

$$\frac{3i\text{Li}_4\left(1-\frac{2}{iax+1}\right)}{4a^2c}-\frac{3i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)^2}{2a^2c}-\frac{3\text{Li}_3\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{2a^2c}-\frac{i\tan^{-1}(ax)^4}{4a^2c}-\frac{\log\left(\frac{2}{1+iax}\right)\tan^{-1}(ax)^3}{a^2c}$$

```
[Out] -1/4*I*arctan(a*x)^4/a^2/c-arctan(a*x)^3*ln(2/(1+I*a*x))/a^2/c-3/2*I*arctan
(a*x)^2*polylog(2,1-2/(1+I*a*x))/a^2/c-3/2*arctan(a*x)*polylog(3,1-2/(1+I*a
*x))/a^2/c+3/4*I*polylog(4,1-2/(1+I*a*x))/a^2/c
```

Rubi [A] time = 0.22, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4920, 4854, 4884, 4994, 4998, 6610}

$$\frac{3i\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)}{4a^2c}-\frac{3i\tan^{-1}(ax)^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^2c}-\frac{3\tan^{-1}(ax)\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^2c}-\frac{i\tan^{-1}(ax)^4}{4a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] ((-I/4)*ArcTan[a*x]^4)/(a^2*c) - (ArcTan[a*x]^3*Log[2/(1 + I*a*x)])/(a^2*c)
 - (((3*I)/2)*ArcTan[a*x]^2*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^2*c) - (3*Arc
Tan[a*x]*PolyLog[3, 1 - 2/(1 + I*a*x)])/(2*a^2*c) + (((3*I)/4)*PolyLog[4, 1
 - 2/(1 + I*a*x)])/(a^2*c)
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
```

```
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx = -\frac{i\tan^{-1}(ax)^4}{4a^2c} - \frac{\int \frac{\tan^{-1}(ax)^3}{i-ax}\,dx}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^4}{4a^2c} - \frac{\tan^{-1}(ax)^3\log\left(\frac{2}{1+iax}\right)}{a^2c} + \frac{3\int \frac{\tan^{-1}(ax)^2\log\left(\frac{2}{1+iax}\right)}{1+a^2x^2}\,dx}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^4}{4a^2c} - \frac{\tan^{-1}(ax)^3\log\left(\frac{2}{1+iax}\right)}{a^2c} - \frac{3i\tan^{-1}(ax)^2\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{2a^2c} + \frac{(3i)\int \frac{\tan^{-1}(ax)\mathrm{Li}}{1+a}}{ac}$$
$$= -\frac{i\tan^{-1}(ax)^4}{4a^2c} - \frac{\tan^{-1}(ax)^3\log\left(\frac{2}{1+iax}\right)}{a^2c} - \frac{3i\tan^{-1}(ax)^2\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{2a^2c} - \frac{3\tan^{-1}(ax)\mathrm{Li}_3}{2a^2c}$$
$$= -\frac{i\tan^{-1}(ax)^4}{4a^2c} - \frac{\tan^{-1}(ax)^3\log\left(\frac{2}{1+iax}\right)}{a^2c} - \frac{3i\tan^{-1}(ax)^2\mathrm{Li}_2\left(1-\frac{2}{1+iax}\right)}{2a^2c} - \frac{3\tan^{-1}(ax)\mathrm{Li}_3}{2a^2c}$$

Mathematica [A] time = 0.01, size = 149, normalized size = 1.08

$$\frac{3i\mathrm{Li}_4\left(\frac{ax+i}{ax-i}\right)}{4a^2c} - \frac{3i\mathrm{Li}_2\left(\frac{ax+i}{ax-i}\right)\tan^{-1}(ax)^2}{2a^2c} - \frac{3\mathrm{Li}_3\left(\frac{ax+i}{ax-i}\right)\tan^{-1}(ax)}{2a^2c} - \frac{i\tan^{-1}(ax)^4}{4a^2c} - \frac{\log\left(\frac{2i}{-ax+i}\right)\tan^{-1}(ax)^3}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
```

```
[Out] ((-1/4*I)*ArcTan[a*x]^4)/(a^2*c) - (ArcTan[a*x]^3*Log[(2*I)/(I - a*x)])/(a^
2*c) - (((3*I)/2)*ArcTan[a*x]^2*PolyLog[2, (I + a*x)/(-I + a*x)])/(a^2*c) -
 (3*ArcTan[a*x]*PolyLog[3, (I + a*x)/(-I + a*x)])/(2*a^2*c) + (((3*I)/4)*Po
lyLog[4, (I + a*x)/(-I + a*x)])/(a^2*c)
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x\arctan(ax)^3}{a^2cx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.73, size = 936, normalized size = 6.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^3/(a^2*c*x^2+c),x)
```

```
[Out] 1/2/a^2/c*ln(a^2*x^2+1)*arctan(a*x)^3-1/a^2/c*arctan(a*x)^3*ln((1+I*a*x)/(a
^2*x^2+1)^(1/2))+1/2*I/a^2/c*arctan(a*x)^3*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+
1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*Pi-1/4*I/a^2/c*arctan(a*x)^3*cs
gn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*P
i+1/4*I/a^2/c*arctan(a*x)^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^
2*x^2+1)+1)^2)^3*Pi+1/4*I/a^2/c*arctan(a*x)^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1
))^3*Pi-3/4*I/a^2/c*polylog(4,-(1+I*a*x)^2/(a^2*x^2+1))-1/4*I/a^2/c*arctan(
a*x)^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I
*a*x)^2/(a^2*x^2+1)+1)^2)^2*Pi+1/4*I/a^2/c*arctan(a*x)^3*csgn(I/((1+I*a*x)^
2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2
*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*Pi+1/4*I/a^2/c*arctan(a*x)^3*csgn(I*
(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*Pi+3/2*I/a^2
/c*arctan(a*x)^2*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))-1/2*I/a^2/c*arctan(a*x
)^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*P
i-1/a^2/c*ln(2)*arctan(a*x)^3+1/4*I/a^2/c*arctan(a*x)^4-3/2/a^2/c*arctan(a*
x)*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-1/4*I/a^2/c*arctan(a*x)^3*csgn(I/((1
+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^
2*x^2+1)+1)^2)^2*Pi-1/4*I/a^2/c*arctan(a*x)^3*csgn(I*((1+I*a*x)^2/(a^2*x^2+
1)+1)^2)^3*Pi
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \arctan (ax)^3}{a^2cx^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(x*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x \operatorname{atan}(a\,x)^3}{c\,a^2\,x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^3)/(c + a^2*c*x^2),x)
```

```
[Out] int((x*atan(a*x)^3)/(c + a^2*c*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^3(ax)}{a^2x^2+1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**3/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x*atan(a*x)**3/(a**2*x**2 + 1), x)/c
```

3.391 $\int \frac{\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx$

Optimal. Leaf size=16

$$\frac{\tan^{-1}(ax)^4}{4ac}$$

```
[Out] 1/4*arctan(a*x)^4/a/c
```

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4884}

$$\frac{\tan^{-1}(ax)^4}{4ac}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(c + a^2*c*x^2),x]
```

```
[Out] ArcTan[a*x]^4/(4*a*c)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx = \frac{\tan^{-1}(ax)^4}{4ac}$$

Mathematica [A] time = 0.00, size = 16, normalized size = 1.00

$$\frac{\tan^{-1}(ax)^4}{4ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^3/(c + a^2*c*x^2),x]
```

```
[Out] ArcTan[a*x]^4/(4*a*c)
```

fricas [A] time = 0.61, size = 14, normalized size = 0.88

$$\frac{\arctan(ax)^4}{4\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] 1/4*arctan(a*x)^4/(a*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.03, size = 15, normalized size = 0.94

$$\frac{\arctan(ax)^4}{4ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/(a^2*c*x^2+c),x)
[Out] 1/4*arctan(a*x)^4/a/c
```

maxima [A] time = 0.61, size = 14, normalized size = 0.88

$$\frac{\arctan(ax)^4}{4\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] 1/4*arctan(a*x)^4/(a*c)
```

mupad [B] time = 0.13, size = 14, normalized size = 0.88

$$\frac{\mathrm{atan}(a\,x)^4}{4\,a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(c + a^2*c*x^2),x)
[Out] atan(a*x)^4/(4*a*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\mathrm{atan}^3(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/(a**2*c*x**2+c),x)
[Out] Integral(atan(a*x)**3/(a**2*x**2 + 1), x)/c
```

3.392 $\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)}\,dx$

Optimal. Leaf size=124

$$\frac{3i\text{Li}_4\left(\frac{2}{1-iax}-1\right)}{4c}-\frac{3i\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)^2}{2c}+\frac{3\text{Li}_3\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{2c}-\frac{i\tan^{-1}(ax)^4}{4c}+\frac{\log\left(2-\frac{2}{1-iax}\right)\tan^{-1}}{c}$$

```
[Out] -1/4*I*arctan(a*x)^4/c+arctan(a*x)^3*ln(2-2/(1-I*a*x))/c-3/2*I*arctan(a*x)^
2*polylog(2,-1+2/(1-I*a*x))/c+3/2*arctan(a*x)*polylog(3,-1+2/(1-I*a*x))/c+3
/4*I*polylog(4,-1+2/(1-I*a*x))/c
```

Rubi [A] time = 0.23, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4924, 4868, 4884, 4992, 4996, 6610}

$$\frac{3i\text{PolyLog}\left(4,-1+\frac{2}{1-iax}\right)}{4c}-\frac{3i\tan^{-1}(ax)^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c}+\frac{3\tan^{-1}(ax)\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c}-\frac{i\tan}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)),x]
```

```
[Out] ((-I/4)*ArcTan[a*x]^4)/c + (ArcTan[a*x]^3*Log[2 - 2/(1 - I*a*x)])/c - (((3*
I)/2)*ArcTan[a*x]^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c + (3*ArcTan[a*x]*Poly
Log[3, -1 + 2/(1 - I*a*x)])/(2*c) + (((3*I)/4)*PolyLog[4, -1 + 2/(1 - I*a*x
)])/c
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4996

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)}\,dx = -\frac{i\tan^{-1}(ax)^4}{4c}+\frac{i\int\frac{\tan^{-1}(ax)^3}{x(i+ax)}\,dx}{c}$$

$$= -\frac{i\tan^{-1}(ax)^4}{4c}+\frac{\tan^{-1}(ax)^3\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{(3a)\int\frac{\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{1+a^2x^2}\,dx}{c}$$

$$= -\frac{i\tan^{-1}(ax)^4}{4c}+\frac{\tan^{-1}(ax)^3\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{3i\tan^{-1}(ax)^2\text{Li}_2\left(-1+\frac{2}{1-iax}\right)}{2c}+\frac{(3ia)\int\frac{\tan^{-1}(}{}}{}$$

$$= -\frac{i\tan^{-1}(ax)^4}{4c}+\frac{\tan^{-1}(ax)^3\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{3i\tan^{-1}(ax)^2\text{Li}_2\left(-1+\frac{2}{1-iax}\right)}{2c}+\frac{3\tan^{-1}(ax)\text{L}}{}$$

$$= -\frac{i\tan^{-1}(ax)^4}{4c}+\frac{\tan^{-1}(ax)^3\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{3i\tan^{-1}(ax)^2\text{Li}_2\left(-1+\frac{2}{1-iax}\right)}{2c}+\frac{3\tan^{-1}(ax)\text{L}}{}$$

Mathematica [B] time = 0.06, size = 354, normalized size = 2.85

$$-\frac{3i\text{Li}_4\left(\frac{-ax-i}{ax-i}\right)}{4c}-\frac{3i\text{Li}_4\left(-\frac{ax+i}{i-ax}\right)}{4c}+\frac{3i\text{Li}_4\left(\frac{ax+i}{ax-i}\right)}{4c}+\frac{3i\text{Li}_2\left(\frac{-ax-i}{ax-i}\right)\tan^{-1}(ax)^2}{2c}+\frac{3i\text{Li}_2\left(-\frac{ax+i}{i-ax}\right)\tan^{-1}(ax)^2}{2c}-\frac{3i\text{Li}_2\left(\frac{ax+i}{ax-i}\right)\tan}{2c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)),x]
```

```
[Out] ((I/4)*ArcTan[a*x]^4)/c + (2*ArcTan[a*x]^3*ArcTanh[1 - (2*I)/(I - a*x)])/c
+ (ArcTan[a*x]^3*Log[(2*I)/(I - a*x)])/c + (((3*I)/2)*ArcTan[a*x]^2*PolyLog
[2, (-I - a*x)/(-I + a*x)])/c + (((3*I)/2)*ArcTan[a*x]^2*PolyLog[2, -((I +
a*x)/(I - a*x))])/c - (((3*I)/2)*ArcTan[a*x]^2*PolyLog[2, (I + a*x)/(-I + a
*x)])/c + (3*ArcTan[a*x]*PolyLog[3, (-I - a*x)/(-I + a*x)])/(2*c) + (3*ArcT
an[a*x]*PolyLog[3, -((I + a*x)/(I - a*x))])/(2*c) - (3*ArcTan[a*x]*PolyLog[
3, (I + a*x)/(-I + a*x)])/(2*c) - (((3*I)/4)*PolyLog[4, (-I - a*x)/(-I + a*
x)])/c - (((3*I)/4)*PolyLog[4, -((I + a*x)/(I - a*x))])/c + (((3*I)/4)*Poly
Log[4, (I + a*x)/(-I + a*x)])/c
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^3}{a^2cx^3+cx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^2*c*x^3 + c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.54, size = 1834, normalized size = 14.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x/(a^2*c*x^2+c),x)
```

```
[Out] -1/4*I*arctan(a*x)^4/c-1/4*I/c*arctan(a*x)^3*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^
2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/(
(1+I*a*x)^2/(a^2*x^2+1)+1)^2)+1/c*arctan(a*x)^3*ln(a*x)+1/2*I/c*arctan(a*x)
^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1
))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+1/2*I/c*
arctan(a*x)^3*Pi-3*I/c*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)-3*I/c*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/4*I/c*arctan
(a*x)^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3-1/c*arctan(a*x)^3*ln((1+I*a*x)
^2/(a^2*x^2+1)-1)+1/4*I/c*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+
1)^2)^3+1/2*I/c*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a
*x)^2/(a^2*x^2+1)+1))^3+1/2*I/c*arctan(a*x)^3*Pi*csgn(((1+I*a*x)^2/(a^2*x^2
+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3-1/2*I/c*arctan(a*x)^3*Pi*csgn(((1+I*a
*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-1/4*I/c*arctan(a*x)^3*P
i*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+6*I/c*pol
ylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I/c*polylog(4,(1+I*a*x)/(a^2*x^2+1)^
(1/2))+6/c*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c*arctan(a*
x)^3*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*
x^2+1)^(1/2))+6/c*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/2/c
*ln(a^2*x^2+1)*arctan(a*x)^3+1/c*arctan(a*x)^3*ln(2)+1/c*arctan(a*x)^3*ln(1
-(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/2*I/c*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/
(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1
)/((1+I*a*x)^2/(a^2*x^2+1)+1))-1/2*I/c*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2
/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+1/4*I/c*arctan(a*x
)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1
)+1)^2)+1/2*I/c*arctan(a*x)^3*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(I
*(1+I*a*x)^2/(a^2*x^2+1))^2-1/2*I/c*arctan(a*x)^3*Pi*csgn(I/((1+I*a*x)^2/(a
^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1
))^2+1/4*I/c*arctan(a*x)^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a
*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-1/2*I/c*arctan(a*x)^3*Pi
*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1
+I*a*x)^2/(a^2*x^2+1)+1))^2-1/2*I/c*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a
^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/
((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/4*I/c*arctan(a*x)^3*Pi*csgn(I/((1+I*a*x)^2
/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+
1)^2)^2-1/4*I/c*arctan(a*x)^3*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn
(I*(1+I*a*x)^2/(a^2*x^2+1))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^3}{\left(a^2cx^2+c\right)x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}(a\,x)^3}{x\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^3/(x*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(ax \right)}}{a^{2}x^{3}+x}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**3/(a**2*x**3 + x), x)/c
```

3.393 $\int \frac{\tan^{-1}(ax)^3}{x^2(c+a^2cx^2)}\,dx$

Optimal. Leaf size=122

$$\frac{3a\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c}-\frac{3ia\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c}-\frac{a\tan^{-1}(ax)^4}{4c}-\frac{ia\tan^{-1}(ax)^3}{c}-\frac{\tan^{-1}(ax)^3}{cx}+\frac{3a\log\left(2-\frac{2}{1-iax}\right)\text{t}}{c}$$

```
[Out] -I*a*arctan(a*x)^3/c-arctan(a*x)^3/c/x-1/4*a*arctan(a*x)^4/c+3*a*arctan(a*x
)^2*ln(2-2/(1-I*a*x))/c-3*I*a*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))/c+3/2*a
*polylog(3,-1+2/(1-I*a*x))/c
```

Rubi [A] time = 0.29, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4918, 4852, 4924, 4868, 4884, 4992, 6610}

$$\frac{3a\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c}-\frac{3ia\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c}-\frac{a\tan^{-1}(ax)^4}{4c}-\frac{ia\tan^{-1}(ax)^3}{c}-\frac{\tan^{-1}(ax)^3}{cx}+$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] ((-I)*a*ArcTan[a*x]^3)/c - ArcTan[a*x]^3/(c*x) - (a*ArcTan[a*x]^4)/(4*c) +
(3*a*ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c - ((3*I)*a*ArcTan[a*x]*PolyLog
[2, -1 + 2/(1 - I*a*x)])/c + (3*a*PolyLog[3, -1 + 2/(1 - I*a*x)])/(2*c)
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
```

```
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{c+a^2cx^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x^2}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^3}{cx}-\frac{a\tan^{-1}(ax)^4}{4c}+\frac{(3a)\int \frac{\tan^{-1}(ax)^2}{x\left(1+a^2x^2\right)}\,dx}{c}$$

$$= -\frac{ia\tan^{-1}(ax)^3}{c}-\frac{\tan^{-1}(ax)^3}{cx}-\frac{a\tan^{-1}(ax)^4}{4c}+\frac{(3ia)\int \frac{\tan^{-1}(ax)^2}{x(i+ax)}\,dx}{c}$$

$$= -\frac{ia\tan^{-1}(ax)^3}{c}-\frac{\tan^{-1}(ax)^3}{cx}-\frac{a\tan^{-1}(ax)^4}{4c}+\frac{3a\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{\left(6a^2\right)\int \frac{\tan}{}}{}$$

$$= -\frac{ia\tan^{-1}(ax)^3}{c}-\frac{\tan^{-1}(ax)^3}{cx}-\frac{a\tan^{-1}(ax)^4}{4c}+\frac{3a\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{3ia\tan^{-1}(}{}$$

$$= -\frac{ia\tan^{-1}(ax)^3}{c}-\frac{\tan^{-1}(ax)^3}{cx}-\frac{a\tan^{-1}(ax)^4}{4c}+\frac{3a\tan^{-1}(ax)^2\log\left(2-\frac{2}{1-iax}\right)}{c}-\frac{3ia\tan^{-1}(}{}$$

Mathematica [A] time = 0.18, size = 108, normalized size = 0.89

$$\frac{a\left(3i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)+\frac{3}{2}\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)-\frac{1}{4}\tan^{-1}(ax)^4-\frac{\tan^{-1}(ax)^3}{ax}+i\tan^{-1}(ax)^3+3\tan^{-1}(ax)^2\log}{c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] (a*((-1/8*I)*Pi^3 + I*ArcTan[a*x]^3 - ArcTan[a*x]^3/(a*x) - ArcTan[a*x]^4/4
 + 3*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + (3*I)*ArcTan[a*x]*Poly
Log[2, E^((-2*I)*ArcTan[a*x])] + (3*PolyLog[3, E^((-2*I)*ArcTan[a*x])])/2))
/c
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan\left(ax\right)^3}{a^2cx^4+cx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^2*c*x^4 + c*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.34, size = 1829, normalized size = 14.99

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^2/(a^2*c*x^2+c),x)
```

```
[Out] 3/2*I*a/c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^
3*arctan(a*x)^2+3/2*I*a/c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^
2/(a^2*x^2+1)+1))^3*arctan(a*x)^2+3/4*I*a/c*arctan(a*x)^2*Pi*csgn(I*((1+I*a
*x)^2/(a^2*x^2+1)+1)^2)^3-3/4*I*a/c*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^
2*x^2+1))^3-3/4*I*a/c*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I
*a*x)^2/(a^2*x^2+1)+1)^2)^3-3/2*I*a/c*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/(
(1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2+3*a/c*arctan(a*x)^2*ln(1-(1+I*a
*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)^3/c/x-1/4*a*arctan(a*x)^4/c+3*a/c*arctan
(a*x)^2*ln(2)-3/2*a/c*arctan(a*x)^2*ln(a^2*x^2+1)+3*a/c*arctan(a*x)^2*ln(a*
x)-3*a/c*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+3*a/c*arctan(a*x)^2*ln
((1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a/c*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1
)^(1/2))+3/2*I*a/c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*
x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*ar
ctan(a*x)^2+3/2*I*a/c*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*
csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2-3/2*I*a/c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2
+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*
a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^2-3/4*I*a/c*arctan(a*x)^2*Pi*csgn(I*(1
+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))+3/4*I*a/c*arct
an(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*
x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+3/4*I*a/c*arctan(a*x)^2*Pi*csgn(I*(
(1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+3/4*I*a
/c*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2
*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-3/2*I*a/c*Pi*csgn(I*((1+I*a*x)^2/(
a^2*x^2+1)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+
1))^2*arctan(a*x)^2-3/2*I*a/c*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2
+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-3/2*I*a/c*Pi*csgn(I/((1+I*a
*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*
x^2+1)+1))^2*arctan(a*x)^2-6*I*a/c*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^
2+1)^(1/2))-6*I*a/c*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/2*
I*a/c*Pi*arctan(a*x)^2+3/2*I*a/c*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csg
n(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a
*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^2-3/4*I*a/c*arctan(a*x)^2*Pi*csgn(I/((1+I
*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^
2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+6*a/c*polylog(3,-(1+I*a*x)/(a^
2*x^2+1)^(1/2))+6*a/c*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*a*arctan(a*x
)^3/c
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{x^2\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(a x \right)}}{a^{2} x^{4} + x^{2}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**3/(a**2*x**4 + x**2), x)/c
```

3.394 $\int \frac{\tan^{-1}(ax)^3}{x^3(c+a^2cx^2)}\,dx$

Optimal. Leaf size=262

$$-\frac{3ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c}-\frac{3ia^2\text{Li}_4\left(\frac{2}{1-iax}-1\right)}{4c}+\frac{3ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)^2}{2c}-\frac{3a^2\text{Li}_3\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{2c}+\frac{ia^2\text{ta}}{}$$

```
[Out] -3/2*I*a^2*arctan(a*x)^2/c-3/2*a*arctan(a*x)^2/c/x-1/2*a^2*arctan(a*x)^3/c-
1/2*arctan(a*x)^3/c/x^2+1/4*I*a^2*arctan(a*x)^4/c+3*a^2*arctan(a*x)*ln(2-2/
(1-I*a*x))/c-a^2*arctan(a*x)^3*ln(2-2/(1-I*a*x))/c-3/2*I*a^2*polylog(2,-1+2
/(1-I*a*x))/c+3/2*I*a^2*arctan(a*x)^2*polylog(2,-1+2/(1-I*a*x))/c-3/2*a^2*a
rctan(a*x)*polylog(3,-1+2/(1-I*a*x))/c-3/4*I*a^2*polylog(4,-1+2/(1-I*a*x))/
c
```

Rubi [A] time = 0.51, antiderivative size = 262, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 9, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.409, Rules used = {4918, 4852, 4924, 4868, 2447, 4884, 4992, 4996, 6610}

$$-\frac{3ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c}-\frac{3ia^2\text{PolyLog}\left(4,-1+\frac{2}{1-iax}\right)}{4c}+\frac{3ia^2\tan^{-1}(ax)^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c}-\frac{3a^2\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] (((-3*I)/2)*a^2*ArcTan[a*x]^2)/c - (3*a*ArcTan[a*x]^2)/(2*c*x) - (a^2*ArcTa
n[a*x]^3)/(2*c) - ArcTan[a*x]^3/(2*c*x^2) + ((I/4)*a^2*ArcTan[a*x]^4)/c + (
3*a^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])/c - (a^2*ArcTan[a*x]^3*Log[2 - 2/
(1 - I*a*x)])/c - (((3*I)/2)*a^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c + (((3*I
)/2)*a^2*ArcTan[a*x]^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c - (3*a^2*ArcTan[a*
x]*PolyLog[3, -1 + 2/(1 - I*a*x)])/(2*c) - (((3*I)/4)*a^2*PolyLog[4, -1 + 2
/(1 - I*a*x)])/c
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4996

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^3\left(c+a^2cx^2\right)}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x^3}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^3}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^4}{4c}+\frac{(3a)\int \frac{\tan^{-1}(ax)^2}{x^2\left(1+a^2x^2\right)}\,dx}{2c}-\frac{\left(ia^2\right)\int \frac{\tan^{-1}(ax)^3}{x(i+ax)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^3}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^4}{4c}-\frac{a^2\tan^{-1}(ax)^3\log\left(2-\frac{2}{1-iax}\right)}{c}+\frac{(3a)\int \frac{\tan^{-1}(ax)^2}{x^2}\,dx}{2c}-$$

$$= -\frac{3a\tan^{-1}(ax)^2}{2cx}-\frac{a^2\tan^{-1}(ax)^3}{2c}-\frac{\tan^{-1}(ax)^3}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^4}{4c}-\frac{a^2\tan^{-1}(ax)^3\log\left(2\right.}{c}$$

$$= -\frac{3ia^2\tan^{-1}(ax)^2}{2c}-\frac{3a\tan^{-1}(ax)^2}{2cx}-\frac{a^2\tan^{-1}(ax)^3}{2c}-\frac{\tan^{-1}(ax)^3}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^4}{4c}-$$

$$= -\frac{3ia^2\tan^{-1}(ax)^2}{2c}-\frac{3a\tan^{-1}(ax)^2}{2cx}-\frac{a^2\tan^{-1}(ax)^3}{2c}-\frac{\tan^{-1}(ax)^3}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^4}{4c}+$$

$$= -\frac{3ia^2\tan^{-1}(ax)^2}{2c}-\frac{3a\tan^{-1}(ax)^2}{2cx}-\frac{a^2\tan^{-1}(ax)^3}{2c}-\frac{\tan^{-1}(ax)^3}{2cx^2}+\frac{ia^2\tan^{-1}(ax)^4}{4c}+$$

Mathematica [A] time = 0.41, size = 189, normalized size = 0.72

$$ia^2\left(\frac{32i\left(a^2x^2+1\right)\tan^{-1}(ax)^3}{a^2x^2}-96\tan^{-1}(ax)^2\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)+96i\tan^{-1}(ax)\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)-96\text{Li}_2\left(e^{2i\tan^{-1}(ax)}\right)\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] ((I/64)*a^2*(Pi^4 - 96*ArcTan[a*x]^2 + ((96*I)*ArcTan[a*x]^2)/(a*x) + ((32*
I)*(1 + a^2*x^2)*ArcTan[a*x]^3)/(a^2*x^2) - 16*ArcTan[a*x]^4 + (64*I)*ArcTa
n[a*x]^3*Log[1 - E^((-2*I)*ArcTan[a*x])] - (192*I)*ArcTan[a*x]*Log[1 - E^((
2*I)*ArcTan[a*x])] - 96*ArcTan[a*x]^2*PolyLog[2, E^((-2*I)*ArcTan[a*x])] -
96*PolyLog[2, E^((2*I)*ArcTan[a*x])] + (96*I)*ArcTan[a*x]*PolyLog[3, E^((-2
*I)*ArcTan[a*x])] + 48*PolyLog[4, E^((-2*I)*ArcTan[a*x])]))/c
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan\left(ax\right)^3}{a^2cx^5+cx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^2*c*x^5 + c*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c),x, algorithm="giac")
```

[Out] sage0*x

maple [B] time = 11.51, size = 479, normalized size = 1.83

$$\frac{3ia^2\arctan(ax)^2\operatorname{polylog}\left(2,-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{c}-\frac{a^2\arctan(ax)^3}{2c}+\frac{3ia^2\arctan(ax)^2\operatorname{polylog}\left(2,\frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{c}-\frac{3a\arctan(ax}{2cx}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)^3/x^3/(a^2*c*x^2+c),x)

[Out] -3*I*a^2/c*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/2*a^2*arctan(a*x)^3/c-3*I*a^2/c*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-3/2*a*arctan(a*x)^2/c/x-1/2*arctan(a*x)^3/c/x^2-6*I*a^2/c*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))-a^2/c*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*a^2/c*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*a^2/c*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-a^2/c*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-3/2*I*a^2*arctan(a*x)^2/c-6*a^2/c*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/4*I*a^2*arctan(a*x)^4/c+3*I*a^2/c*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2/c*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*I*a^2/c*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2/c*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^3}{(a^2cx^2+c)x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c),x, algorithm="maxima")

[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)*x^3), x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3}{x^3\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)),x)

[Out] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^3(ax)}{a^2x^5+x^3}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(atan(a*x)**3/x**3/(a**2*c*x**2+c),x)

[Out] Integral(atan(a*x)**3/(a**2*x**5 + x**3), x)/c

3.395 $\int \frac{\tan^{-1}(ax)^3}{x^4(c+a^2cx^2)}\,dx$

Optimal. Leaf size=227

$$-\frac{2a^3\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{c}+\frac{4ia^3\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c}+\frac{a^3\log(x)}{c}+\frac{a^3\tan^{-1}(ax)^4}{4c}+\frac{4ia^3\tan^{-1}(ax)^3}{3c}-\frac{a^3\tan^{-1}(ax)^2}{2c}$$

```
[Out] -a^2*arctan(a*x)/c/x-1/2*a^3*arctan(a*x)^2/c-1/2*a*arctan(a*x)^2/c/x^2+4/3*
I*a^3*arctan(a*x)^3/c-1/3*arctan(a*x)^3/c/x^3+a^2*arctan(a*x)^3/c/x+1/4*a^3
*arctan(a*x)^4/c+a^3*ln(x)/c-1/2*a^3*ln(a^2*x^2+1)/c-4*a^3*arctan(a*x)^2*ln
(2-2/(1-I*a*x))/c+4*I*a^3*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))/c-2*a^3*pol
ylog(3,-1+2/(1-I*a*x))/c
```

Rubi [A] time = 0.72, antiderivative size = 227, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4918, 4852, 266, 36, 29, 31, 4884, 4924, 4868, 4992, 6610}

$$-\frac{2a^3\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{c}+\frac{4ia^3\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c}-\frac{a^3\log\left(a^2x^2+1\right)}{2c}+\frac{a^3\log(x)}{c}+\frac{a^3\tan^{-1}}{4c}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] -((a^2*ArcTan[a*x])/(c*x)) - (a^3*ArcTan[a*x]^2)/(2*c) - (a*ArcTan[a*x]^2)/
(2*c*x^2) + (((4*I)/3)*a^3*ArcTan[a*x]^3)/c - ArcTan[a*x]^3/(3*c*x^3) + (a^
2*ArcTan[a*x]^3)/(c*x) + (a^3*ArcTan[a*x]^4)/(4*c) + (a^3*Log[x])/c - (a^3*
Log[1 + a^2*x^2])/(2*c) - (4*a^3*ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c +
((4*I)*a^3*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)])/c - (2*a^3*PolyLog[3
, -1 + 2/(1 - I*a*x)])/c
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
```

```
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)}dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)}dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x^4}dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^3}{3cx^3}+a^4\int \frac{\tan^{-1}(ax)^3}{c+a^2cx^2}dx+\frac{a\int \frac{\tan^{-1}(ax)^2}{x^3(1+a^2x^2)}dx}{c}-\frac{a^2\int \frac{\tan^{-1}(ax)^3}{x^2}dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^3}{3cx^3}+\frac{a^2\tan^{-1}(ax)^3}{cx}+\frac{a^3\tan^{-1}(ax)^4}{4c}+\frac{a\int \frac{\tan^{-1}(ax)^2}{x^3}dx}{c}-\frac{a^3\int \frac{\tan^{-1}(ax)^2}{x(1+a^2x^2)}dx}{c}-$$

$$= -\frac{a\tan^{-1}(ax)^2}{2cx^2}+\frac{4ia^3\tan^{-1}(ax)^3}{3c}-\frac{\tan^{-1}(ax)^3}{3cx^3}+\frac{a^2\tan^{-1}(ax)^3}{cx}+\frac{a^3\tan^{-1}(ax)^4}{4c}+\frac{a^2}{}$$

$$= -\frac{a\tan^{-1}(ax)^2}{2cx^2}+\frac{4ia^3\tan^{-1}(ax)^3}{3c}-\frac{\tan^{-1}(ax)^3}{3cx^3}+\frac{a^2\tan^{-1}(ax)^3}{cx}+\frac{a^3\tan^{-1}(ax)^4}{4c}-\frac{4a^3}{}$$

$$= -\frac{a^2\tan^{-1}(ax)}{cx}-\frac{a^3\tan^{-1}(ax)^2}{2c}-\frac{a\tan^{-1}(ax)^2}{2cx^2}+\frac{4ia^3\tan^{-1}(ax)^3}{3c}-\frac{\tan^{-1}(ax)^3}{3cx^3}+\frac{a^2\,\mathrm{ta}}{}$$

$$= -\frac{a^2\tan^{-1}(ax)}{cx}-\frac{a^3\tan^{-1}(ax)^2}{2c}-\frac{a\tan^{-1}(ax)^2}{2cx^2}+\frac{4ia^3\tan^{-1}(ax)^3}{3c}-\frac{\tan^{-1}(ax)^3}{3cx^3}+\frac{a^2\,\mathrm{ta}}{}$$

$$= -\frac{a^2\tan^{-1}(ax)}{cx}-\frac{a^3\tan^{-1}(ax)^2}{2c}-\frac{a\tan^{-1}(ax)^2}{2cx^2}+\frac{4ia^3\tan^{-1}(ax)^3}{3c}-\frac{\tan^{-1}(ax)^3}{3cx^3}+\frac{a^2\,\mathrm{ta}}{}$$

$$= -\frac{a^2\tan^{-1}(ax)}{cx}-\frac{a^3\tan^{-1}(ax)^2}{2c}-\frac{a\tan^{-1}(ax)^2}{2cx^2}+\frac{4ia^3\tan^{-1}(ax)^3}{3c}-\frac{\tan^{-1}(ax)^3}{3cx^3}+\frac{a^2\,\mathrm{ta}}{}$$

Mathematica [A] time = 0.51, size = 180, normalized size = 0.79

$$\frac{a^3\left(-\frac{\tan^{-1}(ax)^3}{3a^3x^3}+\log\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)-\frac{\tan^{-1}(ax)^2}{2a^2x^2}-4i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)-2\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)+\frac{1}{4}\tan^{-1}(ax)^4\right.}{c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] (a^3*((I/6)*Pi^3 - ArcTan[a*x]/(a*x) - ArcTan[a*x]^2/2 - ArcTan[a*x]^2/(2*a
^2*x^2) - ((4*I)/3)*ArcTan[a*x]^3 - ArcTan[a*x]^3/(3*a^3*x^3) + ArcTan[a*x]
^3/(a*x) + ArcTan[a*x]^4/4 - 4*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])
] + Log[(a*x)/Sqrt[1 + a^2*x^2]] - (4*I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*A
rcTan[a*x])] - 2*PolyLog[3, E^((-2*I)*ArcTan[a*x])]))/c
```

fricas [F] time = 0.88, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)^3}{a^2cx^6+cx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^2*c*x^6 + c*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 3.81, size = 5574, normalized size = 24.56

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^4/(a^2*c*x^2+c),x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3}{x^4\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(a x \right)}}{a^{2} x^{6} + x^{4}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**4/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**3/(a**2*x**6 + x**4), x)/c
```

3.396 $\int \frac{x^3 \tan^{-1}(ax)^3}{(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=270

$$\frac{3i\text{Li}_4\left(1-\frac{2}{iax+1}\right)}{4a^4c^2}-\frac{3i\text{Li}_2\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)^2}{2a^4c^2}-\frac{3\text{Li}_3\left(1-\frac{2}{iax+1}\right)\tan^{-1}(ax)}{2a^4c^2}-\frac{i\tan^{-1}(ax)^4}{4a^4c^2}-\frac{\tan^{-1}(ax)^3}{4a^4c^2}+\frac{3\tan^{-1}}{8a^4c}$$

```
[Out] 3/8*x/a^3/c^2/(a^2*x^2+1)+3/8*arctan(a*x)/a^4/c^2-3/4*arctan(a*x)/a^4/c^2/(
a^2*x^2+1)-3/4*x*arctan(a*x)^2/a^3/c^2/(a^2*x^2+1)-1/4*arctan(a*x)^3/a^4/c^
2+1/2*arctan(a*x)^3/a^4/c^2/(a^2*x^2+1)-1/4*I*arctan(a*x)^4/a^4/c^2-arctan(
a*x)^3*ln(2/(1+I*a*x))/a^4/c^2-3/2*I*arctan(a*x)^2*polylog(2,1-2/(1+I*a*x))
/a^4/c^2-3/2*arctan(a*x)*polylog(3,1-2/(1+I*a*x))/a^4/c^2+3/4*I*polylog(4,1
-2/(1+I*a*x))/a^4/c^2
```

Rubi [A] time = 0.41, antiderivative size = 270, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4964, 4920, 4854, 4884, 4994, 4998, 6610, 4930, 4892, 199, 205}

$$\frac{3i\text{PolyLog}\left(4,1-\frac{2}{1+iax}\right)}{4a^4c^2}-\frac{3i\tan^{-1}(ax)^2\text{PolyLog}\left(2,1-\frac{2}{1+iax}\right)}{2a^4c^2}-\frac{3\tan^{-1}(ax)\text{PolyLog}\left(3,1-\frac{2}{1+iax}\right)}{2a^4c^2}+\frac{3x}{8a^3c^2\left(a^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (3*x)/(8*a^3*c^2*(1 + a^2*x^2)) + (3*ArcTan[a*x])/(8*a^4*c^2) - (3*ArcTan[a
*x])/(4*a^4*c^2*(1 + a^2*x^2)) - (3*x*ArcTan[a*x]^2)/(4*a^3*c^2*(1 + a^2*x^
2)) - ArcTan[a*x]^3/(4*a^4*c^2) + ArcTan[a*x]^3/(2*a^4*c^2*(1 + a^2*x^2)) -
 ((I/4)*ArcTan[a*x]^4)/(a^4*c^2) - (ArcTan[a*x]^3*Log[2/(1 + I*a*x)])/(a^4*
c^2) - (((3*I)/2)*ArcTan[a*x]^2*PolyLog[2, 1 - 2/(1 + I*a*x)])/(a^4*c^2) -
(3*ArcTan[a*x]*PolyLog[3, 1 - 2/(1 + I*a*x)])/(2*a^4*c^2) + (((3*I)/4)*Poly
Log[4, 1 - 2/(1 + I*a*x)])/(a^4*c^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4998

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(2
*c*d), x] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1,
 u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] && E
qQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx = -\frac{\int \frac{x \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx}{a^2} + \frac{\int \frac{x \tan^{-1}(ax)^3}{c+a^2cx^2} dx}{a^2c}$$

$$= \frac{\tan^{-1}(ax)^3}{2a^4c^2\left(1+a^2x^2\right)} - \frac{i \tan^{-1}(ax)^4}{4a^4c^2} - \frac{3\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2} dx}{2a^3} - \frac{\int \frac{\tan^{-1}(ax)^3}{i-ax} dx}{a^3c^2}$$

$$= -\frac{3x \tan^{-1}(ax)^2}{4a^3c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4a^4c^2} + \frac{\tan^{-1}(ax)^3}{2a^4c^2\left(1+a^2x^2\right)} - \frac{i \tan^{-1}(ax)^4}{4a^4c^2} - \frac{\tan^{-1}(ax)^3 \log\left(\frac{}{1}\right.}{a^4c^2}$$

$$= -\frac{3 \tan^{-1}(ax)}{4a^4c^2\left(1+a^2x^2\right)} - \frac{3x \tan^{-1}(ax)^2}{4a^3c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4a^4c^2} + \frac{\tan^{-1}(ax)^3}{2a^4c^2\left(1+a^2x^2\right)} - \frac{i \tan^{-1}(ax)^4}{4a^4c^2} -$$

$$= \frac{3x}{8a^3c^2\left(1+a^2x^2\right)} - \frac{3 \tan^{-1}(ax)}{4a^4c^2\left(1+a^2x^2\right)} - \frac{3x \tan^{-1}(ax)^2}{4a^3c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4a^4c^2} + \frac{\tan^{-1}(ax)^3}{2a^4c^2\left(1+a^2x^2\right.}$$

$$= \frac{3x}{8a^3c^2\left(1+a^2x^2\right)} + \frac{3 \tan^{-1}(ax)}{8a^4c^2} - \frac{3 \tan^{-1}(ax)}{4a^4c^2\left(1+a^2x^2\right)} - \frac{3x \tan^{-1}(ax)^2}{4a^3c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4a^4c^2} +$$

Mathematica [A] time = 0.20, size = 156, normalized size = 0.58

$$\frac{24i \tan^{-1}(ax)^2 \mathrm{Li}_2\left(-e^{2i\tan^{-1}(ax)}\right) - 24\tan^{-1}(ax)\mathrm{Li}_3\left(-e^{2i\tan^{-1}(ax)}\right) - 12i\mathrm{Li}_4\left(-e^{2i\tan^{-1}(ax)}\right) + 4i\tan^{-1}(ax)^4 - 16\,\mathrm{ta}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] ((4*I)*ArcTan[a*x]^4 - 6*ArcTan[a*x]*Cos[2*ArcTan[a*x]] + 4*ArcTan[a*x]^3*C
os[2*ArcTan[a*x]] - 16*ArcTan[a*x]^3*Log[1 + E^((2*I)*ArcTan[a*x])] + (24*I
)*ArcTan[a*x]^2*PolyLog[2, -E^((2*I)*ArcTan[a*x])] - 24*ArcTan[a*x]*PolyLog
[3, -E^((2*I)*ArcTan[a*x])] - (12*I)*PolyLog[4, -E^((2*I)*ArcTan[a*x])] + 3
*Sin[2*ArcTan[a*x]] - 6*ArcTan[a*x]^2*Sin[2*ArcTan[a*x]])/(16*a^4*c^2)
```

fricas [F] time = 0.69, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^3 \arctan(ax)^3}{a^4c^2x^4 + 2a^2c^2x^2 + c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(x^3*arctan(a*x)^3/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.01, size = 1227, normalized size = 4.54

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^2,x)
```

```
[Out] 3/2*I/a^3/c^2/(16*I+16*a*x)*x-3/2/a^4/c^2*arctan(a*x)^2/(8*a*x-8*I)-3/2/a^4
/c^2*arctan(a*x)^2/(8*I+8*a*x)+1/2/a^4/c^2*arctan(a*x)^3*ln(a^2*x^2+1)-1/a^
4/c^2*arctan(a*x)^3*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-3/2/a^4/c^2*arctan(a*x)
*polylog(3,-(1+I*a*x)^2/(a^2*x^2+1))-1/a^4/c^2*arctan(a*x)^3*ln(2)+1/4*I/a^
4/c^2*arctan(a*x)^4-3/4*I/a^4/c^2*polylog(4,-(1+I*a*x)^2/(a^2*x^2+1))-1/4*a
rctan(a*x)^3/a^4/c^2+3/2*I/a^3/c^2*arctan(a*x)^2/(8*a*x-8*I)*x+1/4*I/a^4/c^
2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3*arctan(a*x)^3*Pi+1/4*I/a^4/c^2*csgn(I*(
1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^3*Pi-1/
4*I/a^4/c^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3*arctan(a*x)^3*Pi-3/2*I/
a^3/c^2*arctan(a*x)^2/(8*I+8*a*x)*x+3/2/a^4/c^2/(16*a*x-16*I)+3/2/a^4/c^2/(
16*I+16*a*x)+3/16/a^3/c^2*arctan(a*x)/(a*x-I)*x+3/16/a^3/c^2*arctan(a*x)/(I
+a*x)*x+3/2*I/a^4/c^2*arctan(a*x)^2*polylog(2,-(1+I*a*x)^2/(a^2*x^2+1))+3/1
6*I/a^4/c^2*arctan(a*x)/(a*x-I)-3/16*I/a^4/c^2*arctan(a*x)/(I+a*x)+1/2*arct
an(a*x)^3/a^4/c^2/(a^2*x^2+1)-3/2*I/a^3/c^2/(16*a*x-16*I)*x+1/4*I/a^4/c^2*c
sgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I
*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*arctan(a*x)^3*Pi-1/
2*I/a^4/c^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))*arctan(a*x)^3*Pi+1/4*I/a^4/c^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*arctan(a*x)^3*Pi-1/4*I/a^4/c^2*csgn(I*(1+I
*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1
)+1)^2)^2*arctan(a*x)^3*Pi-1/4*I/a^4/c^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)
^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*arctan(
a*x)^3*Pi+1/2*I/a^4/c^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2*csgn(I*((1+
I*a*x)^2/(a^2*x^2+1)+1))*arctan(a*x)^3*Pi-1/4*I/a^4/c^2*csgn(I*((1+I*a*x)^2
/(a^2*x^2+1)+1)^2)*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*arctan(a*x)^3*Pi
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan(ax)^3}{\left(a^2cx^2 + c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2 + c)^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3 \operatorname{atan}(a\,x)^3}{\left(c\,a^2\,x^2 + c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \operatorname{atan}^3(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**3/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**3*atan(a*x)**3/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.397 $\int \frac{x^2 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=135

$$\frac{\tan^{-1}(ax)^4}{8a^3c^2}+\frac{3\tan^{-1}(ax)^2}{8a^3c^2}-\frac{x\tan^{-1}(ax)^3}{2a^2c^2\left(a^2x^2+1\right)}+\frac{3x\tan^{-1}(ax)}{4a^2c^2\left(a^2x^2+1\right)}+\frac{3}{8a^3c^2\left(a^2x^2+1\right)}-\frac{3\tan^{-1}(ax)^2}{4a^3c^2\left(a^2x^2+1\right)}$$

```
[Out] 3/8/a^3/c^2/(a^2*x^2+1)+3/4*x*arctan(a*x)/a^2/c^2/(a^2*x^2+1)+3/8*arctan(a*
x)^2/a^3/c^2-3/4*arctan(a*x)^2/a^3/c^2/(a^2*x^2+1)-1/2*x*arctan(a*x)^3/a^2/
c^2/(a^2*x^2+1)+1/8*arctan(a*x)^4/a^3/c^2
```

Rubi [A] time = 0.14, antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.182$, Rules used = {4936, 4930, 4892, 261}

$$\frac{3}{8a^3c^2\left(a^2x^2+1\right)}-\frac{x\tan^{-1}(ax)^3}{2a^2c^2\left(a^2x^2+1\right)}-\frac{3\tan^{-1}(ax)^2}{4a^3c^2\left(a^2x^2+1\right)}+\frac{3x\tan^{-1}(ax)}{4a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^4}{8a^3c^2}+\frac{3\tan^{-1}(ax)^2}{8a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] 3/(8*a^3*c^2*(1 + a^2*x^2)) + (3*x*ArcTan[a*x])/(4*a^2*c^2*(1 + a^2*x^2)) +
 (3*ArcTan[a*x]^2)/(8*a^3*c^2) - (3*ArcTan[a*x]^2)/(4*a^3*c^2*(1 + a^2*x^2)
) - (x*ArcTan[a*x]^3)/(2*a^2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^4/(8*a^3*c^2)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{x\tan^{-1}(ax)^3}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^4}{8a^3c^2} + \frac{3\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}dx}{2a}$$

$$= -\frac{3\tan^{-1}(ax)^2}{4a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^3}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^4}{8a^3c^2} + \frac{3\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}dx}{2a^2}$$

$$= \frac{3x\tan^{-1}(ax)}{4a^2c^2\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^2}{8a^3c^2} - \frac{3\tan^{-1}(ax)^2}{4a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^3}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^4}{8a^3c^2} -$$

$$= \frac{3}{8a^3c^2\left(1+a^2x^2\right)} + \frac{3x\tan^{-1}(ax)}{4a^2c^2\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^2}{8a^3c^2} - \frac{3\tan^{-1}(ax)^2}{4a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax}{2a^2c^2\left(1+a^2\right.}$$

Mathematica [A] time = 0.06, size = 74, normalized size = 0.55

$$\frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^4 + 3\left(a^2x^2-1\right)\tan^{-1}(ax)^2 - 4ax\tan^{-1}(ax)^3 + 6ax\tan^{-1}(ax) + 3}{8a^3c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (3 + 6*a*x*ArcTan[a*x] + 3*(-1 + a^2*x^2)*ArcTan[a*x]^2 - 4*a*x*ArcTan[a*x]
^3 + (1 + a^2*x^2)*ArcTan[a*x]^4)/(8*a^3*c^2*(1 + a^2*x^2))
```

fricas [A] time = 0.74, size = 76, normalized size = 0.56

$$-\frac{4\,ax\arctan(ax)^3 - \left(a^2x^2+1\right)\arctan(ax)^4 - 6\,ax\arctan(ax) - 3\left(a^2x^2-1\right)\arctan(ax)^2 - 3}{8\left(a^5c^2x^2 + a^3c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] -1/8*(4*a*x*arctan(a*x)^3 - (a^2*x^2 + 1)*arctan(a*x)^4 - 6*a*x*arctan(a*x)
 - 3*(a^2*x^2 - 1)*arctan(a*x)^2 - 3)/(a^5*c^2*x^2 + a^3*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 124, normalized size = 0.92

$$\frac{3}{8a^3c^2\left(a^2x^2+1\right)} + \frac{3x\arctan(ax)}{4a^2c^2\left(a^2x^2+1\right)} + \frac{3\arctan(ax)^2}{8a^3c^2} - \frac{3\arctan(ax)^2}{4a^3c^2\left(a^2x^2+1\right)} - \frac{x\arctan(ax)^3}{2a^2c^2\left(a^2x^2+1\right)} + \frac{\arctan(ax)^4}{8a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^2,x)
```

[Out] 3/8/a^3/c^2/(a^2*x^2+1)+3/4*x*arctan(a*x)/a^2/c^2/(a^2*x^2+1)+3/8*arctan(a*x)^2/a^3/c^2-3/4*arctan(a*x)^2/a^3/c^2/(a^2*x^2+1)-1/2*x*arctan(a*x)^3/a^2/c^2/(a^2*x^2+1)+1/8*arctan(a*x)^4/a^3/c^2

maxima [A] time = 0.47, size = 218, normalized size = 1.61

$$-\frac{1}{2}\left(\frac{x}{a^4c^2x^2+a^2c^2}-\frac{\arctan(ax)}{a^3c^2}\right)\arctan(ax)^3-\frac{3\left(\left(a^2x^2+1\right)\arctan(ax)^2+1\right)a\arctan(ax)^2}{4\left(a^6c^2x^2+a^4c^2\right)}-\frac{1}{8}\left(\frac{\left(\left(a^2x^2+1\right)\operatorname{ar}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")

[Out] -1/2*(x/(a^4*c^2*x^2 + a^2*c^2) - arctan(a*x)/(a^3*c^2))*arctan(a*x)^3 - 3/4*((a^2*x^2 + 1)*arctan(a*x)^2 + 1)*a*arctan(a*x)^2/(a^6*c^2*x^2 + a^4*c^2) - 1/8*(((a^2*x^2 + 1)*arctan(a*x)^4 + 3*(a^2*x^2 + 1)*arctan(a*x)^2 - 3)*a^2/(a^8*c^2*x^2 + a^6*c^2) - 2*(2*(a^2*x^2 + 1)*arctan(a*x)^3 + 3*a*x + 3*(a^2*x^2 + 1)*arctan(a*x))*a*arctan(a*x)/(a^7*c^2*x^2 + a^5*c^2))*a

mupad [B] time = 0.45, size = 119, normalized size = 0.88

$$\frac{3}{2\,a^2\,\left(4\,a^3\,c^2\,x^2+4\,a\,c^2\right)}+\mathrm{atan}\left(a\,x\right)^2\,\left(\frac{3}{8\,a^3\,c^2}-\frac{3}{4\,a^5\,c^2\,\left(\frac{1}{a^2}+x^2\right)}\right)+\frac{\mathrm{atan}\left(a\,x\right)^4}{8\,a^3\,c^2}+\frac{3\,x\,\mathrm{atan}\left(a\,x\right)}{4\,a^4\,c^2\,\left(\frac{1}{a^2}+x^2\right)}-\frac{x\,\mathrm{atan}\left(a\,x\right)}{2\,a^4\,c^2\,\left(\frac{1}{a^2}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^2,x)

[Out] 3/(2*a^2*(4*a*c^2 + 4*a^3*c^2*x^2)) + atan(a*x)^2*(3/(8*a^3*c^2) - 3/(4*a^5*c^2*(1/a^2 + x^2))) + atan(a*x)^4/(8*a^3*c^2) + (3*x*atan(a*x))/(4*a^4*c^2*(1/a^2 + x^2)) - (x*atan(a*x)^3)/(2*a^4*c^2*(1/a^2 + x^2))

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2\operatorname{atan}^3(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**2*atan(a*x)**3/(a**2*c*x**2+c)**2,x)

[Out] Integral(x**2*atan(a*x)**3/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2

3.398 $\int \frac{x \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=133

$$-\frac{3x}{8ac^2\left(a^2x^2+1\right)}-\frac{\tan^{-1}(ax)^3}{2a^2c^2\left(a^2x^2+1\right)}+\frac{3x\tan^{-1}(ax)^2}{4ac^2\left(a^2x^2+1\right)}+\frac{3\tan^{-1}(ax)}{4a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^3}{4a^2c^2}-\frac{3\tan^{-1}(ax)}{8a^2c^2}$$

```
[Out] -3/8*x/a/c^2/(a^2*x^2+1)-3/8*arctan(a*x)/a^2/c^2+3/4*arctan(a*x)/a^2/c^2/(a
^2*x^2+1)+3/4*x*arctan(a*x)^2/a/c^2/(a^2*x^2+1)+1/4*arctan(a*x)^3/a^2/c^2-1
/2*arctan(a*x)^3/a^2/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.12, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4930, 4892, 199, 205}

$$-\frac{3x}{8ac^2\left(a^2x^2+1\right)}-\frac{\tan^{-1}(ax)^3}{2a^2c^2\left(a^2x^2+1\right)}+\frac{3x\tan^{-1}(ax)^2}{4ac^2\left(a^2x^2+1\right)}+\frac{3\tan^{-1}(ax)}{4a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^3}{4a^2c^2}-\frac{3\tan^{-1}(ax)}{8a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-3*x)/(8*a*c^2*(1 + a^2*x^2)) - (3*ArcTan[a*x])/(8*a^2*c^2) + (3*ArcTan[a*
x])/(4*a^2*c^2*(1 + a^2*x^2)) + (3*x*ArcTan[a*x]^2)/(4*a*c^2*(1 + a^2*x^2))
 + ArcTan[a*x]^3/(4*a^2*c^2) - ArcTan[a*x]^3/(2*a^2*c^2*(1 + a^2*x^2))
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{\tan^{-1}(ax)^3}{2a^2c^2\left(1+a^2x^2\right)} + \frac{3\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx}{2a}$$

$$= \frac{3x\tan^{-1}(ax)^2}{4ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{4a^2c^2} - \frac{\tan^{-1}(ax)^3}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3}{2}\int \frac{x\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx$$

$$= \frac{3\tan^{-1}(ax)}{4a^2c^2\left(1+a^2x^2\right)} + \frac{3x\tan^{-1}(ax)^2}{4ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{4a^2c^2} - \frac{\tan^{-1}(ax)^3}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3\int \frac{1}{\left(c+a^2cx^2\right)^2}\,dx}{4a}$$

$$= -\frac{3x}{8ac^2\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)}{4a^2c^2\left(1+a^2x^2\right)} + \frac{3x\tan^{-1}(ax)^2}{4ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{4a^2c^2} - \frac{\tan^{-1}(ax)^3}{2a^2c^2\left(1+a^2x^2\right)} -$$

$$= -\frac{3x}{8ac^2\left(1+a^2x^2\right)} - \frac{3\tan^{-1}(ax)}{8a^2c^2} + \frac{3\tan^{-1}(ax)}{4a^2c^2\left(1+a^2x^2\right)} + \frac{3x\tan^{-1}(ax)^2}{4ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^3}{4a^2c^2} - \frac{\text{ta}}{2a^2c}$$

Mathematica [A] time = 0.05, size = 68, normalized size = 0.51

$$\frac{2\left(a^2x^2-1\right)\tan^{-1}(ax)^3+\left(3-3a^2x^2\right)\tan^{-1}(ax)-3ax+6ax\tan^{-1}(ax)^2}{8a^2c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-3*a*x + (3 - 3*a^2*x^2)*ArcTan[a*x] + 6*a*x*ArcTan[a*x]^2 + 2*(-1 + a^2*x
^2)*ArcTan[a*x]^3)/(8*a^2*c^2*(1 + a^2*x^2))
```

fricas [A] time = 0.64, size = 69, normalized size = 0.52

$$\frac{6\,ax\arctan\left(ax\right)^2+2\left(a^2x^2-1\right)\arctan\left(ax\right)^3-3\,ax-3\left(a^2x^2-1\right)\arctan\left(ax\right)}{8\left(a^4c^2x^2+a^2c^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] 1/8*(6*a*x*arctan(a*x)^2 + 2*(a^2*x^2 - 1)*arctan(a*x)^3 - 3*a*x - 3*(a^2*x
^2 - 1)*arctan(a*x))/(a^4*c^2*x^2 + a^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 122, normalized size = 0.92

$$-\frac{3x}{8a\,c^2\left(a^2x^2+1\right)}-\frac{3\arctan\left(ax\right)}{8a^2c^2}+\frac{3\arctan\left(ax\right)}{4a^2c^2\left(a^2x^2+1\right)}+\frac{3x\arctan\left(ax\right)^2}{4a\,c^2\left(a^2x^2+1\right)}+\frac{\arctan\left(ax\right)^3}{4a^2c^2}-\frac{\arctan\left(ax\right)^3}{2a^2c^2\left(a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^3/(a^2*c*x^2+c)^2,x)
```

```
[Out] -3/8*x/a/c^2/(a^2*x^2+1)-3/8*arctan(a*x)/a^2/c^2+3/4*arctan(a*x)/a^2/c^2/(a
^2*x^2+1)+3/4*x*arctan(a*x)^2/a/c^2/(a^2*x^2+1)+1/4*arctan(a*x)^3/a^2/c^2-1
/2*arctan(a*x)^3/a^2/c^2/(a^2*x^2+1)
```

maxima [A] time = 0.45, size = 174, normalized size = 1.31

$$\frac{3\left(\frac{x}{a^2cx^2+c}+\frac{\arctan(ax)}{ac}\right)\arctan(ax)^2}{4\,ac}+\frac{\frac{\left(2\left(a^2x^2+1\right)\arctan(ax)^3-3\,ax-3\left(a^2x^2+1\right)\arctan(ax)\right)a^2}{a^5cx^2+a^3c}-\frac{6\left(\left(a^2x^2+1\right)\arctan(ax)^2-1\right)a\arctan(}{a^4cx^2+a^2c}}{8\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] 3/4*(x/(a^2*c*x^2 + c) + arctan(a*x)/(a*c))*arctan(a*x)^2/(a*c) + 1/8*((2*(
a^2*x^2 + 1)*arctan(a*x)^3 - 3*a*x - 3*(a^2*x^2 + 1)*arctan(a*x))*a^2/(a^5*
c*x^2 + a^3*c) - 6*((a^2*x^2 + 1)*arctan(a*x)^2 - 1)*a*arctan(a*x)/(a^4*c*x
^2 + a^2*c))/(a*c) - 1/2*arctan(a*x)^3/((a^2*c*x^2 + c)*a^2*c)
```

mupad [B] time = 0.43, size = 114, normalized size = 0.86

$$\operatorname{atan}(a\,x)^3\left(\frac{1}{4\,a^2\,c^2}-\frac{1}{2\,a^4\,c^2\,\left(\frac{1}{a^2}+x^2\right)}\right)-\frac{3\,x}{2\,\left(4\,a^3\,c^2\,x^2+4\,a\,c^2\right)}-\frac{3\operatorname{atan}(a\,x)}{8\,a^2\,c^2}+\frac{3\operatorname{atan}(a\,x)}{4\,a^4\,c^2\,\left(\frac{1}{a^2}+x^2\right)}+\frac{3\,x\operatorname{atan}(a\,x}{4\,a^3\,c^2\,\left(\frac{1}{a^2}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^2,x)
```

```
[Out] atan(a*x)^3*(1/(4*a^2*c^2) - 1/(2*a^4*c^2*(1/a^2 + x^2))) - (3*x)/(2*(4*a*c
^2 + 4*a^3*c^2*x^2)) - (3*atan(a*x))/(8*a^2*c^2) + (3*atan(a*x))/(4*a^4*c^2
*(1/a^2 + x^2)) + (3*x*atan(a*x)^2)/(4*a^3*c^2*(1/a^2 + x^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{x\operatorname{atan}^3(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**3/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x*atan(a*x)**3/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.399 $\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=129

$$-\frac{3}{8ac^2\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^3}{2c^2\left(a^2x^2+1\right)}+\frac{3\tan^{-1}(ax)^2}{4ac^2\left(a^2x^2+1\right)}-\frac{3x\tan^{-1}(ax)}{4c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^4}{8ac^2}-\frac{3\tan^{-1}(ax)^2}{8ac^2}$$

```
[Out] -3/8/a/c^2/(a^2*x^2+1)-3/4*x*arctan(a*x)/c^2/(a^2*x^2+1)-3/8*arctan(a*x)^2/
a/c^2+3/4*arctan(a*x)^2/a/c^2/(a^2*x^2+1)+1/2*x*arctan(a*x)^3/c^2/(a^2*x^2+
1)+1/8*arctan(a*x)^4/a/c^2
```

Rubi [A] time = 0.10, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4892, 4930, 261}

$$-\frac{3}{8ac^2\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^3}{2c^2\left(a^2x^2+1\right)}+\frac{3\tan^{-1}(ax)^2}{4ac^2\left(a^2x^2+1\right)}-\frac{3x\tan^{-1}(ax)}{4c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^4}{8ac^2}-\frac{3\tan^{-1}(ax)^2}{8ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(c + a^2*c*x^2)^2,x]
```

```
[Out] -3/(8*a*c^2*(1 + a^2*x^2)) - (3*x*ArcTan[a*x])/(4*c^2*(1 + a^2*x^2)) - (3*A
rcTan[a*x]^2)/(8*a*c^2) + (3*ArcTan[a*x]^2)/(4*a*c^2*(1 + a^2*x^2)) + (x*Ar
cTan[a*x]^3)/(2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^4/(8*a*c^2)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx = \frac{x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^4}{8ac^2} - \frac{1}{2}(3a)\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx$$
$$= \frac{3\tan^{-1}(ax)^2}{4ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^4}{8ac^2} - \frac{3}{2}\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^2}\,dx$$
$$= -\frac{3x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3\tan^{-1}(ax)^2}{8ac^2} + \frac{3\tan^{-1}(ax)^2}{4ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^4}{8ac^2} + \frac{1}{4}(3$$
$$= -\frac{3}{8ac^2\left(1+a^2x^2\right)} - \frac{3x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3\tan^{-1}(ax)^2}{8ac^2} + \frac{3\tan^{-1}(ax)^2}{4ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} +$$

Mathematica [A] time = 0.03, size = 71, normalized size = 0.55

$$\frac{\left(a^2x^2+1\right)\tan^{-1}(ax)^4+\left(3-3a^2x^2\right)\tan^{-1}(ax)^2+4ax\tan^{-1}(ax)^3-6ax\tan^{-1}(ax)-3}{8c^2\left(a^3x^2+a\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^3/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-3 - 6*a*x*ArcTan[a*x] + (3 - 3*a^2*x^2)*ArcTan[a*x]^2 + 4*a*x*ArcTan[a*x]
^3 + (1 + a^2*x^2)*ArcTan[a*x]^4)/(8*c^2*(a + a^3*x^2))
```

fricas [A] time = 1.06, size = 73, normalized size = 0.57

$$\frac{4\,ax\arctan(ax)^3+\left(a^2x^2+1\right)\arctan(ax)^4-6\,ax\arctan(ax)-3\left(a^2x^2-1\right)\arctan(ax)^2-3}{8\left(a^3c^2x^2+ac^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] 1/8*(4*a*x*arctan(a*x)^3 + (a^2*x^2 + 1)*arctan(a*x)^4 - 6*a*x*arctan(a*x)
- 3*(a^2*x^2 - 1)*arctan(a*x)^2 - 3)/(a^3*c^2*x^2 + a*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 118, normalized size = 0.91

$$-\frac{3}{8a\,c^2\left(a^2x^2+1\right)}-\frac{3x\arctan(ax)}{4c^2\left(a^2x^2+1\right)}-\frac{3\arctan(ax)^2}{8a\,c^2}+\frac{3\arctan(ax)^2}{4a\,c^2\left(a^2x^2+1\right)}+\frac{x\arctan(ax)^3}{2c^2\left(a^2x^2+1\right)}+\frac{\arctan(ax)^4}{8a\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/(a^2*c*x^2+c)^2,x)
```

```
[Out] -3/8/a/c^2/(a^2*x^2+1)-3/4*x*arctan(a*x)/c^2/(a^2*x^2+1)-3/8*arctan(a*x)^2/
a/c^2+3/4*arctan(a*x)^2/a/c^2/(a^2*x^2+1)+1/2*x*arctan(a*x)^3/c^2/(a^2*x^2+
1)+1/8*arctan(a*x)^4/a/c^2
```

maxima [A] time = 0.47, size = 213, normalized size = 1.65

$$\frac{1}{2}\left(\frac{x}{a^2c^2x^2+c^2}+\frac{\arctan(ax)}{ac^2}\right)\arctan(ax)^3-\frac{3\left(\left(a^2x^2+1\right)\arctan(ax)^2-1\right)a\arctan(ax)^2}{4\left(a^4c^2x^2+a^2c^2\right)}-\frac{1}{8}\left(\frac{\left(\left(a^2x^2+1\right)\arctan\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(x/(a^2*c^2*x^2 + c^2) + arctan(a*x)/(a*c^2))*arctan(a*x)^3 - 3/4*((a^2
*x^2 + 1)*arctan(a*x)^2 - 1)*a*arctan(a*x)^2/(a^4*c^2*x^2 + a^2*c^2) - 1/8*
(((a^2*x^2 + 1)*arctan(a*x)^4 - 3*(a^2*x^2 + 1)*arctan(a*x)^2 + 3)*a^2/(a^6
*c^2*x^2 + a^4*c^2) - 2*(2*(a^2*x^2 + 1)*arctan(a*x)^3 - 3*a*x - 3*(a^2*x^2
 + 1)*arctan(a*x))*a*arctan(a*x)/(a^5*c^2*x^2 + a^3*c^2))*a
```

mupad [B] time = 0.43, size = 119, normalized size = 0.92

$$\frac{\operatorname{atan}(a\,x)^4}{8\,a\,c^2}-\operatorname{atan}(a\,x)^2\left(\frac{3}{8\,a\,c^2}-\frac{3}{4\,a^3\,c^2\,\left(\frac{1}{a^2}+x^2\right)}\right)-\frac{3}{2\,a\,\left(4\,a^2\,c^2\,x^2+4\,c^2\right)}-\frac{3\,x\operatorname{atan}(a\,x)}{4\,a^2\,c^2\,\left(\frac{1}{a^2}+x^2\right)}+\frac{x\operatorname{atan}(a\,x)^3}{2\,a^2\,c^2\,\left(\frac{1}{a^2}+x^2\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(c + a^2*c*x^2)^2,x)
```

```
[Out] atan(a*x)^4/(8*a*c^2) - atan(a*x)^2*(3/(8*a*c^2) - 3/(4*a^3*c^2*(1/a^2 + x^
2))) - 3/(2*a*(4*c^2 + 4*a^2*c^2*x^2)) - (3*x*atan(a*x))/(4*a^2*c^2*(1/a^2
+ x^2)) + (x*atan(a*x)^3)/(2*a^2*c^2*(1/a^2 + x^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{\operatorname{atan}^3(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**3/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.400 $\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=240

$$\frac{3ax}{8c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^3}{2c^2\left(a^2x^2+1\right)}-\frac{3ax\tan^{-1}(ax)^2}{4c^2\left(a^2x^2+1\right)}-\frac{3\tan^{-1}(ax)}{4c^2\left(a^2x^2+1\right)}+\frac{3i\text{Li}_4\left(\frac{2}{1-iax}-1\right)}{4c^2}-\frac{3i\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax}{2c^2}$$

```
[Out] 3/8*a*x/c^2/(a^2*x^2+1)+3/8*arctan(a*x)/c^2-3/4*arctan(a*x)/c^2/(a^2*x^2+1)
-3/4*a*x*arctan(a*x)^2/c^2/(a^2*x^2+1)-1/4*arctan(a*x)^3/c^2+1/2*arctan(a*x
)^3/c^2/(a^2*x^2+1)-1/4*I*arctan(a*x)^4/c^2+arctan(a*x)^3*ln(2-2/(1-I*a*x))
/c^2-3/2*I*arctan(a*x)^2*polylog(2,-1+2/(1-I*a*x))/c^2+3/2*arctan(a*x)*poly
log(3,-1+2/(1-I*a*x))/c^2+3/4*I*polylog(4,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.43, antiderivative size = 240, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4966, 4924, 4868, 4884, 4992, 4996, 6610, 4930, 4892, 199, 205}

$$\frac{3i\text{PolyLog}\left(4,-1+\frac{2}{1-iax}\right)}{4c^2}-\frac{3i\tan^{-1}(ax)^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^2}+\frac{3\tan^{-1}(ax)\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^2}+\frac{}{8c^2(}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^2),x]
```

```
[Out] (3*a*x)/(8*c^2*(1 + a^2*x^2)) + (3*ArcTan[a*x])/(8*c^2) - (3*ArcTan[a*x])/(
4*c^2*(1 + a^2*x^2)) - (3*a*x*ArcTan[a*x]^2)/(4*c^2*(1 + a^2*x^2)) - ArcTan
[a*x]^3/(4*c^2) + ArcTan[a*x]^3/(2*c^2*(1 + a^2*x^2)) - ((I/4)*ArcTan[a*x]^
4)/c^2 + (ArcTan[a*x]^3*Log[2 - 2/(1 - I*a*x)])/c^2 - (((3*I)/2)*ArcTan[a*x
]^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^2 + (3*ArcTan[a*x]*PolyLog[3, -1 + 2/
(1 - I*a*x)])/(2*c^2) + (((3*I)/4)*PolyLog[4, -1 + 2/(1 - I*a*x)])/c^2
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4996

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^4}{4c^2} - \frac{1}{2}(3a)\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx + \frac{i\int \frac{\tan^{-1}(ax)^3}{x(i+ax)}\,dx}{c^2}$$

$$= -\frac{3ax\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4c^2} + \frac{\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^4}{4c^2} + \frac{\tan^{-1}(ax)^3\log\left(2-\right.}{c^2}$$

$$= -\frac{3\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3ax\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4c^2} + \frac{\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} - \frac{i\tan^{-1}(ax)^4}{4c^2} + \frac{\tan}{}$$

$$= \frac{3ax}{8c^2\left(1+a^2x^2\right)} - \frac{3\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3ax\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4c^2} + \frac{\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} - \frac{i\,\mathrm{ta}}{}$$

$$= \frac{3ax}{8c^2\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)}{8c^2} - \frac{3\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3ax\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{4c^2} + \frac{\tan}{2c^2\left(1\right.}$$

Mathematica [A] time = 0.23, size = 156, normalized size = 0.65

$$\frac{96i\tan^{-1}(ax)^2\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) + 96\tan^{-1}(ax)\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) - 48i\mathrm{Li}_4\left(e^{-2i\tan^{-1}(ax)}\right) + 16i\tan^{-1}(ax)^4 + 64\,\mathrm{t}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^2),x]
```

```
[Out] ((-I)*Pi^4 + (16*I)*ArcTan[a*x]^4 - 24*ArcTan[a*x]*Cos[2*ArcTan[a*x]] + 16*
ArcTan[a*x]^3*Cos[2*ArcTan[a*x]] + 64*ArcTan[a*x]^3*Log[1 - E^((-2*I)*ArcTa
n[a*x])] + (96*I)*ArcTan[a*x]^2*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + 96*Arc
Tan[a*x]*PolyLog[3, E^((-2*I)*ArcTan[a*x])] - (48*I)*PolyLog[4, E^((-2*I)*A
rcTan[a*x])] + 12*Sin[2*ArcTan[a*x]] - 24*ArcTan[a*x]^2*Sin[2*ArcTan[a*x]])
/(64*c^2)
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)^3}{a^4c^2x^5 + 2\,a^2c^2x^3 + c^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.36, size = 2089, normalized size = 8.70

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/2*arctan(a*x)^3/c^2/(a^2*x^2+1)-1/4*I*arctan(a*x)^4/c^2+3/2/c^2/(16*I+16*
a*x)+3/2/c^2/(16*a*x-16*I)-1/c^2*arctan(a*x)^3*ln((1+I*a*x)^2/(a^2*x^2+1)-1
)+1/c^2*arctan(a*x)^3*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c^2*arctan(a*x)^3*l
n(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/16/c^2*arctan(a*x)/(a*x-I)*a*x-1/4*I/c^2
*arctan(a*x)^3*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/
(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+
1/2*I/c^2*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I
*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^
2*x^2+1)+1))+1/4*I/c^2*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^
2)^3+3/2*I/c^2/(16*I+16*a*x)*a*x-3/2*I/c^2/(16*a*x-16*I)*a*x-1/4*arctan(a*x
)^3/c^2-1/2*I/c^2*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/2*I/c^2*arc
tan(a*x)^3*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x
^2+1))^2+1/4*I/c^2*arctan(a*x)^3*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*c
sgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-1/4*I/c^2*ar
ctan(a*x)^3*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^
2*x^2+1))+1/2*I/c^2*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1
+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^
2*x^2+1)+1))-1/2*I/c^2*arctan(a*x)^3*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))
*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/4*I/c^
2*arctan(a*x)^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*
x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-3/2*I/c^2*arctan(a*x)^2/(8*I+8*a*x)
*a*x+3/2*I/c^2*arctan(a*x)^2/(8*a*x-8*I)*a*x+6/c^2*arctan(a*x)*polylog(3,-(
1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c^2*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^
(1/2))+6/c^2*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c^2*arcta
n(a*x)^3*ln(2)-3/2/c^2*arctan(a*x)^2/(8*I+8*a*x)+3/16/c^2*arctan(a*x)/(I+a*
x)*a*x-1/4*I/c^2*arctan(a*x)^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)
^2/(a^2*x^2+1)+1)^2)^3+1/2*I/c^2*arctan(a*x)^3*Pi*csgn(((1+I*a*x)^2/(a^2*x^
2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3-1/2*I/c^2*arctan(a*x)^3*Pi*csgn(((1+
I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/2*I/c^2*arctan(a*x
)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3-1/
4*I/c^2*arctan(a*x)^3*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^3-3/2/c^2*arctan(a
*x)^2/(8*a*x-8*I)+1/c^2*arctan(a*x)^3*ln(a*x)-1/2/c^2*arctan(a*x)^3*ln(a^2*
x^2+1)-3*I/c^2*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I/c^2
*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/2*I/c^2*arctan(a*x
)^3*Pi+3/16*I/c^2*arctan(a*x)/(a*x-I)-3/16*I/c^2*arctan(a*x)/(I+a*x)-1/2*I/
c^2*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x
^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1
/4*I/c^2*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+
I*a*x)^2/(a^2*x^2+1)+1)^2)-1/2*I/c^2*arctan(a*x)^3*Pi*csgn(I*((1+I*a*x)^2/(
a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+6*I/c^2*polylog(4,-(
1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I/c^2*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{3}}{\left(a^{2}cx^{2}+c\right)^{2}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3}{x\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^2),x)
[Out] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^3(ax)}{a^4x^5+2a^2x^3+x}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x/(a**2*c*x**2+c)**2,x)
[Out] Integral(atan(a*x)**3/(a**4*x**5 + 2*a**2*x**3 + x), x)/c**2
```

3.401 $\int \frac{\tan^{-1}(ax)^3}{x^2(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=234

$$\frac{3a}{8c^2(a^2x^2+1)}-\frac{a^2x\tan^{-1}(ax)^3}{2c^2(a^2x^2+1)}-\frac{3a\tan^{-1}(ax)^2}{4c^2(a^2x^2+1)}+\frac{3a^2x\tan^{-1}(ax)}{4c^2(a^2x^2+1)}+\frac{3a\mathrm{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c^2}-\frac{3ia\mathrm{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c^2}$$

```
[Out] 3/8*a/c^2/(a^2*x^2+1)+3/4*a^2*x*arctan(a*x)/c^2/(a^2*x^2+1)+3/8*a*arctan(a*
x)^2/c^2-3/4*a*arctan(a*x)^2/c^2/(a^2*x^2+1)-I*a*arctan(a*x)^3/c^2-arctan(a
*x)^3/c^2/x-1/2*a^2*x*arctan(a*x)^3/c^2/(a^2*x^2+1)-3/8*a*arctan(a*x)^4/c^2
+3*a*arctan(a*x)^2*ln(2-2/(1-I*a*x))/c^2-3*I*a*arctan(a*x)*polylog(2,-1+2/(
1-I*a*x))/c^2+3/2*a*polylog(3,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 0.47, antiderivative size = 234, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4966, 4918, 4852, 4924, 4868, 4884, 4992, 6610, 4892, 4930, 261}

$$\frac{3a\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^2}-\frac{3ia\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^2}+\frac{3a}{8c^2(a^2x^2+1)}-\frac{a^2x\tan^{-1}(ax)^3}{2c^2(a^2x^2+1)}-\frac{3a\tan^{-1}(ax}{4c^2(a^2x^2+}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^2),x]
```

```
[Out] (3*a)/(8*c^2*(1 + a^2*x^2)) + (3*a^2*x*ArcTan[a*x])/(4*c^2*(1 + a^2*x^2)) +
 (3*a*ArcTan[a*x]^2)/(8*c^2) - (3*a*ArcTan[a*x]^2)/(4*c^2*(1 + a^2*x^2)) -
(I*a*ArcTan[a*x]^3)/c^2 - ArcTan[a*x]^3/(c^2*x) - (a^2*x*ArcTan[a*x]^3)/(2*
c^2*(1 + a^2*x^2)) - (3*a*ArcTan[a*x]^4)/(8*c^2) + (3*a*ArcTan[a*x]^2*Log[2
 - 2/(1 - I*a*x)])/c^2 - ((3*I)*a*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)
])/c^2 + (3*a*PolyLog[3, -1 + 2/(1 - I*a*x)])/(2*c^2)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
```

```
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{a^2x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} - \frac{a\tan^{-1}(ax)^4}{8c^2} + \frac{1}{2}\left(3a^3\right)\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)^3}{x^2}\,dx}{c^2} - \frac{a^2\int \frac{\tan}{c}}{}$$

$$= -\frac{3a\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{c^2x} - \frac{a^2x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} - \frac{3a\tan^{-1}(ax)^4}{8c^2} + \frac{1}{2}\left(3a^2\right)\int \frac{\tan^{-1}(ax}{\left(c+a^2cx^2\right.}$$

$$= \frac{3a^2x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} + \frac{3a\tan^{-1}(ax)^2}{8c^2} - \frac{3a\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{ia\tan^{-1}(ax)^3}{c^2} - \frac{\tan^{-1}(ax)^3}{c^2x} - \frac{a^2x\tan}{2c^2(1}$$

$$= \frac{3a}{8c^2\left(1+a^2x^2\right)} + \frac{3a^2x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} + \frac{3a\tan^{-1}(ax)^2}{8c^2} - \frac{3a\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{ia\tan^{-1}(ax)^3}{c^2} - \tan$$

$$= \frac{3a}{8c^2\left(1+a^2x^2\right)} + \frac{3a^2x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} + \frac{3a\tan^{-1}(ax)^2}{8c^2} - \frac{3a\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{ia\tan^{-1}(ax)^3}{c^2} - \tan$$

$$= \frac{3a}{8c^2\left(1+a^2x^2\right)} + \frac{3a^2x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} + \frac{3a\tan^{-1}(ax)^2}{8c^2} - \frac{3a\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{ia\tan^{-1}(ax)^3}{c^2} - \tan$$

Mathematica [A] time = 0.36, size = 157, normalized size = 0.67

$$a\left(48i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) + 24\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) - 6\tan^{-1}(ax)^4 - \frac{16\tan^{-1}(ax)^3}{ax} + 16i\tan^{-1}(ax)^3 + 48\tan^{-1}($$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^2),x]
```

```
[Out] (a*((-2*I)*Pi^3 + (16*I)*ArcTan[a*x]^3 - (16*ArcTan[a*x]^3)/(a*x) - 6*ArcTa
n[a*x]^4 + 3*Cos[2*ArcTan[a*x]] - 6*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]] + 48*A
rcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + (48*I)*ArcTan[a*x]*PolyLog[2
, E^((-2*I)*ArcTan[a*x])] + 24*PolyLog[3, E^((-2*I)*ArcTan[a*x])] + 6*ArcTa
n[a*x]*Sin[2*ArcTan[a*x]] - 4*ArcTan[a*x]^3*Sin[2*ArcTan[a*x]]))/(16*c^2)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(ax)^3}{a^4c^2x^6 + 2\,a^2c^2x^4 + c^2x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.35, size = 2038, normalized size = 8.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^2,x)
```

```
[Out] 3/4*I*a/c^2*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*
x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+3/2*I*a/c^2*arctan(a*x)^2
*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((
1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+3/2*I*a/c^2*Pi*arcta
n(a*x)^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)
)^2+3/4*I*a/c^2*Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn
(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-3/4*I*a/c^2*arc
tan(a*x)^2*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2
*x^2+1))+3/8*a*arctan(a*x)^2/c^2-arctan(a*x)^3/c^2/x-3/8*a*arctan(a*x)^4/c^
2-1/2*a^2*x*arctan(a*x)^3/c^2/(a^2*x^2+1)+3/2*I/c^2*arctan(a*x)/(8*I+8*a*x)
*a^2*x-3/2*I/c^2*arctan(a*x)/(8*a*x-8*I)*a^2*x+3/4*I*a/c^2*Pi*arctan(a*x)^2
*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3-3/2*I*a/c^2*arctan(a*x)^2*Pi*csgn(
((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/2*I*a/c^2*arct
an(a*x)^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^
3-3/4*I*a/c^2*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/
(a^2*x^2+1)+1)^2)^3+3/2*I*a/c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x
^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^3-3/4*I*a/c^2*Pi*arctan(a*x)^2*csgn(I
*(1+I*a*x)^2/(a^2*x^2+1))^3-3/2*I*a/c^2*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^
2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+
1)+1))^2-3/2*I*a/c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*c
sgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/4*I*a/c^
2*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^
2/(a^2*x^2+1)+1)^2)-3/2*I*a/c^2*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x
^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-3/2*I*a/c^2*arctan(a*x)^2
*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((
1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/2*a/c^2*arctan(a
*x)/(8*I+8*a*x)+3/2*a/c^2*arctan(a*x)/(8*a*x-8*I)-3/4*a*arctan(a*x)^2/c^2/(
a^2*x^2+1)-I*a*arctan(a*x)^3/c^2+6*a/c^2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(
1/2))+6*a/c^2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a/c^2*arctan(a*x)^2*
ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-3*a/c^2*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2*x
^2+1)-1)+3*a/c^2*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a/c^2*ar
ctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3/32*I*a/c^2/(a*x-I)+3/32*I*a
/c^2/(I+a*x)-3/32/c^2/(a*x-I)*a^2*x-3/32/c^2/(I+a*x)*a^2*x+3*a/c^2*arctan(a
*x)^2*ln(2)+3*a/c^2*arctan(a*x)^2*ln(a*x)-3/2*a/c^2*arctan(a*x)^2*ln(a^2*x^
2+1)+3/2*I*a/c^2*arctan(a*x)^2*Pi-6*I*a/c^2*arctan(a*x)*polylog(2,-(1+I*a*x
)/(a^2*x^2+1)^(1/2))-6*I*a/c^2*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^
(1/2))+3/2*I*a/c^2*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csg
n(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a
*x)^2/(a^2*x^2+1)+1))-3/4*I*a/c^2*Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2
*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1
)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3}{x^2\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(ax \right)}}{a^{4}x^{6}+2a^{2}x^{4}+x^{2}}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**2/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**3/(a**4*x**6 + 2*a**2*x**4 + x**2), x)/c**2
```

3.402 $\int \frac{\tan^{-1}(ax)^3}{x^3(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=374

$$-\frac{3ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c^2}-\frac{3ia^2\text{Li}_4\left(\frac{2}{1-iax}-1\right)}{2c^2}+\frac{3ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)^2}{c^2}-\frac{3a^2\text{Li}_3\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c^2}-\frac{a^2\tan}{2c^2\,(}$$

```
[Out] -3/8*a^3*x/c^2/(a^2*x^2+1)-3/8*a^2*arctan(a*x)/c^2+3/4*a^2*arctan(a*x)/c^2/
(a^2*x^2+1)-3/2*I*a^2*polylog(2,-1+2/(1-I*a*x))/c^2-3/2*a*arctan(a*x)^2/c^2
/x+3/4*a^3*x*arctan(a*x)^2/c^2/(a^2*x^2+1)-1/4*a^2*arctan(a*x)^3/c^2-1/2*ar
ctan(a*x)^3/c^2/x^2-1/2*a^2*arctan(a*x)^3/c^2/(a^2*x^2+1)-3/2*I*a^2*arctan(
a*x)^2/c^2+3*a^2*arctan(a*x)*ln(2-2/(1-I*a*x))/c^2-2*a^2*arctan(a*x)^3*ln(2
-2/(1-I*a*x))/c^2+3*I*a^2*arctan(a*x)^2*polylog(2,-1+2/(1-I*a*x))/c^2-3/2*I
*a^2*polylog(4,-1+2/(1-I*a*x))/c^2-3*a^2*arctan(a*x)*polylog(3,-1+2/(1-I*a*
x))/c^2+1/2*I*a^2*arctan(a*x)^4/c^2
```

Rubi [A] time = 1.03, antiderivative size = 374, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 14, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.636, Rules used = {4966, 4918, 4852, 4924, 4868, 2447, 4884, 4992, 4996, 6610, 4930, 4892, 199, 205}

$$-\frac{3ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^2}-\frac{3ia^2\text{PolyLog}\left(4,-1+\frac{2}{1-iax}\right)}{2c^2}+\frac{3ia^2\tan^{-1}(ax)^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^2}-\frac{3a^2\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^3*(c + a^2*c*x^2)^2),x]
```

```
[Out] (-3*a^3*x)/(8*c^2*(1 + a^2*x^2)) - (3*a^2*ArcTan[a*x])/(8*c^2) + (3*a^2*Arc
Tan[a*x])/(4*c^2*(1 + a^2*x^2)) - (((3*I)/2)*a^2*ArcTan[a*x]^2)/c^2 - (3*a*
ArcTan[a*x]^2)/(2*c^2*x) + (3*a^3*x*ArcTan[a*x]^2)/(4*c^2*(1 + a^2*x^2)) -
(a^2*ArcTan[a*x]^3)/(4*c^2) - ArcTan[a*x]^3/(2*c^2*x^2) - (a^2*ArcTan[a*x]^
3)/(2*c^2*(1 + a^2*x^2)) + ((I/2)*a^2*ArcTan[a*x]^4)/c^2 + (3*a^2*ArcTan[a*
x]*Log[2 - 2/(1 - I*a*x)])/c^2 - (2*a^2*ArcTan[a*x]^3*Log[2 - 2/(1 - I*a*x)
])/c^2 - (((3*I)/2)*a^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^2 + ((3*I)*a^2*Ar
cTan[a*x]^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^2 - (3*a^2*ArcTan[a*x]*PolyLo
g[3, -1 + 2/(1 - I*a*x)])/c^2 - (((3*I)/2)*a^2*PolyLog[4, -1 + 2/(1 - I*a*x
)])/c^2
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
```

```
x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
```

```
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4996

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^3\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^3}{x^3\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= a^4\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)^3}{x^3}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^3}{2c^2x^2} - \frac{a^2\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} + \frac{1}{2}\left(3a^3\right)\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx + \frac{(3a)\int \frac{\tan^{-1}(ax)^2}{x^2\left(1+a^2x^2\right)}\,dx}{2c^2} - 2\Bigg(-$$

$$= \frac{3a^3x\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} + \frac{a^2\tan^{-1}(ax)^3}{4c^2} - \frac{\tan^{-1}(ax)^3}{2c^2x^2} - \frac{a^2\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} - \frac{1}{2}\left(3a^4\right)\int \frac{x\tan^{-1}(ax}{\left(c+a^2cx^2\right.}$$

$$= \frac{3a^2\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3a\tan^{-1}(ax)^2}{2c^2x} + \frac{3a^3x\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)^3}{4c^2} - \frac{\tan^{-1}(ax)^3}{2c^2x^2} - \frac{a^2\,\mathrm{ta}}{2c^2\,(}$$

$$= -\frac{3a^3x}{8c^2\left(1+a^2x^2\right)} + \frac{3a^2\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3ia^2\tan^{-1}(ax)^2}{2c^2} - \frac{3a\tan^{-1}(ax)^2}{2c^2x} + \frac{3a^3x\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)}$$

$$= -\frac{3a^3x}{8c^2\left(1+a^2x^2\right)} - \frac{3a^2\tan^{-1}(ax)}{8c^2} + \frac{3a^2\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3ia^2\tan^{-1}(ax)^2}{2c^2} - \frac{3a\tan^{-1}(ax)^2}{2c^2x} +$$

$$= -\frac{3a^3x}{8c^2\left(1+a^2x^2\right)} - \frac{3a^2\tan^{-1}(ax)}{8c^2} + \frac{3a^2\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3ia^2\tan^{-1}(ax)^2}{2c^2} - \frac{3a\tan^{-1}(ax)^2}{2c^2x} +$$

Mathematica [A] time = 0.74, size = 243, normalized size = 0.65

$$a^2\left(-\frac{16\left(a^2x^2+1\right)\tan^{-1}(ax)^3}{a^2x^2} - 96i\tan^{-1}(ax)^2\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) - 96\tan^{-1}(ax)\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) - 48i\mathrm{Li}_2\left(e^{2i\tan^{-1}(ax)}\right) + \right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^3*(c + a^2*c*x^2)^2),x]
```

```
[Out] (a^2*(I*Pi^4 - (48*I)*ArcTan[a*x]^2 - (48*ArcTan[a*x]^2)/(a*x) - (16*(1 + a
^2*x^2)*ArcTan[a*x]^3)/(a^2*x^2) - (16*I)*ArcTan[a*x]^4 + 12*ArcTan[a*x]*Co
s[2*ArcTan[a*x]] - 8*ArcTan[a*x]^3*Cos[2*ArcTan[a*x]] - 64*ArcTan[a*x]^3*Lo
g[1 - E^((-2*I)*ArcTan[a*x])] + 96*ArcTan[a*x]*Log[1 - E^((2*I)*ArcTan[a*x]
)] - (96*I)*ArcTan[a*x]^2*PolyLog[2, E^((-2*I)*ArcTan[a*x])] - (48*I)*PolyL
og[2, E^((2*I)*ArcTan[a*x])] - 96*ArcTan[a*x]*PolyLog[3, E^((-2*I)*ArcTan[a
*x])] + (48*I)*PolyLog[4, E^((-2*I)*ArcTan[a*x])] - 6*Sin[2*ArcTan[a*x]] +
12*ArcTan[a*x]^2*Sin[2*ArcTan[a*x]]))/(32*c^2)
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^3}{a^4c^2x^7 + 2\,a^2c^2x^5 + c^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 13.94, size = 815, normalized size = 2.18

$$-\frac{3a^2}{32c^2\,(ax+i)}-\frac{3a^2}{32c^2\,(ax-i)}-\frac{a^2\arctan\left(ax\right)^3}{2c^2}+\frac{3ia^2\arctan\left(ax\right)}{16c^2\,(ax+i)}-\frac{3ia^3x}{32c^2\,(ax+i)}+\frac{3ia^3x}{32c^2\,(ax-i)}+\frac{ia^2\arctan\left(ax\right)^3}{8c^2\,(ax-i)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^2,x)
```

```
[Out] -3/32*a^2/c^2/(I+a*x)-3/32*a^2/c^2/(a*x-I)-1/2*a^2*arctan(a*x)^3/c^2+3/16*I
*a^2/c^2/(I+a*x)*arctan(a*x)-3/32*I*a^3/c^2/(I+a*x)*x+3/32*I*a^3/c^2/(a*x-I
)*x+1/8*I*a^2/c^2/(a*x-I)*arctan(a*x)^3-3/16*I*a^2/c^2/(a*x-I)*arctan(a*x)+
6*I*a^2/c^2*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*a^2/c^
2*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-1/8*I*a^2/c^2/(I+a*
x)*arctan(a*x)^3+1/8*a^3/c^2/(I+a*x)*arctan(a*x)^3*x-3/16*a^3/c^2/(I+a*x)*a
rctan(a*x)*x+1/8*a^3/c^2/(a*x-I)*arctan(a*x)^3*x-3/16*a^3/c^2/(a*x-I)*arcta
n(a*x)*x-1/2*arctan(a*x)^3/c^2/x^2-3/2*a*arctan(a*x)^2/c^2/x-3/2*I*a^2*arct
an(a*x)^2/c^2+1/2*I*a^2*arctan(a*x)^4/c^2+3/16*I*a^3/c^2/(I+a*x)*arctan(a*x
)^2*x-3/16*I*a^3/c^2/(a*x-I)*arctan(a*x)^2*x+3/16*a^2/c^2/(I+a*x)*arctan(a*
x)^2+3*a^2/c^2*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2/c^2*arct
an(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*a^2/c^2*arctan(a*x)^3*ln(1-(1+I
*a*x)/(a^2*x^2+1)^(1/2))-12*a^2/c^2*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^
2+1)^(1/2))-2*a^2/c^2*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-12*a^
2/c^2*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*a^2/c^2*polyl
og(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-12*I*a^2/c^2*polylog(4,-(1+I*a*x)/(a^2*x^
2+1)^(1/2))-3*I*a^2/c^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-12*I*a^2/c^
2*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/16*a^2/c^2/(a*x-I)*arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^3}{\left(a^2cx^2+c\right)^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^2*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{x^3\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^3(ax)}{a^4x^7+2a^2x^5+x^3}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**3/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**3/(a**4*x**7 + 2*a**2*x**5 + x**3), x)/c**2
```

3.403 $\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=332

$$-\frac{7a^3\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{2c^2}+\frac{7ia^3\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c^2}+\frac{a^3\log(x)}{c^2}+\frac{5a^3\tan^{-1}(ax)^4}{8c^2}+\frac{7ia^3\tan^{-1}(ax)^3}{3c^2}-\frac{7a^3\tan^{-1}(a}{8c^2}$$

```
[Out] -3/8*a^3/c^2/(a^2*x^2+1)-a^2*arctan(a*x)/c^2/x-3/4*a^4*x*arctan(a*x)/c^2/(a
^2*x^2+1)-7/8*a^3*arctan(a*x)^2/c^2-1/2*a*arctan(a*x)^2/c^2/x^2+3/4*a^3*arc
tan(a*x)^2/c^2/(a^2*x^2+1)+7/3*I*a^3*arctan(a*x)^3/c^2-1/3*arctan(a*x)^3/c^
2/x^3+2*a^2*arctan(a*x)^3/c^2/x+1/2*a^4*x*arctan(a*x)^3/c^2/(a^2*x^2+1)+5/8
*a^3*arctan(a*x)^4/c^2+a^3*ln(x)/c^2-1/2*a^3*ln(a^2*x^2+1)/c^2-7*a^3*arctan
(a*x)^2*ln(2-2/(1-I*a*x))/c^2+7*I*a^3*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))
/c^2-7/2*a^3*polylog(3,-1+2/(1-I*a*x))/c^2
```

Rubi [A] time = 1.29, antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 35, number of rules used = 15, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.682, Rules used = {4966, 4918, 4852, 266, 36, 29, 31, 4884, 4924, 4868, 4992, 6610, 4892, 4930, 261}

$$-\frac{7a^3\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^2}+\frac{7ia^3\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^2}-\frac{3a^3}{8c^2\left(a^2x^2+1\right)}-\frac{a^3\log\left(a^2x^2+1\right)}{2c^2}+\frac{a^4x}{2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^4*(c + a^2*c*x^2)^2),x]
```

```
[Out] (-3*a^3)/(8*c^2*(1 + a^2*x^2)) - (a^2*ArcTan[a*x])/(c^2*x) - (3*a^4*x*ArcTa
n[a*x])/(4*c^2*(1 + a^2*x^2)) - (7*a^3*ArcTan[a*x]^2)/(8*c^2) - (a*ArcTan[a
*x]^2)/(2*c^2*x^2) + (3*a^3*ArcTan[a*x]^2)/(4*c^2*(1 + a^2*x^2)) + (((7*I)/
3)*a^3*ArcTan[a*x]^3)/c^2 - ArcTan[a*x]^3/(3*c^2*x^3) + (2*a^2*ArcTan[a*x]^
3)/(c^2*x) + (a^4*x*ArcTan[a*x]^3)/(2*c^2*(1 + a^2*x^2)) + (5*a^3*ArcTan[a*
x]^4)/(8*c^2) + (a^3*Log[x])/c^2 - (a^3*Log[1 + a^2*x^2])/(2*c^2) - (7*a^3*
ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c^2 + ((7*I)*a^3*ArcTan[a*x]*PolyLog[
2, -1 + 2/(1 - I*a*x)])/c^2 - (7*a^3*PolyLog[3, -1 + 2/(1 - I*a*x)])/(2*c^2
)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)^2}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^2}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= a^4\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx + \frac{\int \frac{\tan^{-1}(ax)^3}{x^4}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)}\,dx}{c}$$

$$= -\frac{\tan^{-1}(ax)^3}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^4}{8c^2} - \frac{1}{2}\left(3a^5\right)\int \frac{x\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^2}\,dx + \frac{a\int \frac{\tan^{-1}}{x^3(1+}}{c^2}$$

$$= \frac{3a^3\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} - \frac{\tan^{-1}(ax)^3}{3c^2x^3} + \frac{a^4x\tan^{-1}(ax)^3}{2c^2\left(1+a^2x^2\right)} + \frac{a^3\tan^{-1}(ax)^4}{8c^2} - \frac{1}{2}\left(3a^4\right)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)}$$

$$= -\frac{3a^4x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3a^3\tan^{-1}(ax)^2}{8c^2} - \frac{a\tan^{-1}(ax)^2}{2c^2x^2} + \frac{3a^3\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} + \frac{ia^3\tan^{-1}(ax)^3}{3c^2} -$$

$$= -\frac{3a^3}{8c^2\left(1+a^2x^2\right)} - \frac{3a^4x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{3a^3\tan^{-1}(ax)^2}{8c^2} - \frac{a\tan^{-1}(ax)^2}{2c^2x^2} + \frac{3a^3\tan^{-1}(ax)^2}{4c^2\left(1+a^2x^2\right)} +$$

$$= -\frac{3a^3}{8c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^2x} - \frac{3a^4x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{7a^3\tan^{-1}(ax)^2}{8c^2} - \frac{a\tan^{-1}(ax)^2}{2c^2x^2} + \frac{3a}{4c}$$

$$= -\frac{3a^3}{8c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^2x} - \frac{3a^4x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{7a^3\tan^{-1}(ax)^2}{8c^2} - \frac{a\tan^{-1}(ax)^2}{2c^2x^2} + \frac{3a}{4c}$$

$$= -\frac{3a^3}{8c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^2x} - \frac{3a^4x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{7a^3\tan^{-1}(ax)^2}{8c^2} - \frac{a\tan^{-1}(ax)^2}{2c^2x^2} + \frac{3a}{4c}$$

$$= -\frac{3a^3}{8c^2\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^2x} - \frac{3a^4x\tan^{-1}(ax)}{4c^2\left(1+a^2x^2\right)} - \frac{7a^3\tan^{-1}(ax)^2}{8c^2} - \frac{a\tan^{-1}(ax)^2}{2c^2x^2} + \frac{3a}{4c}$$

Mathematica [A] time = 0.93, size = 243, normalized size = 0.73

$$a^3\left(-\frac{\tan^{-1}(ax)^3}{3a^3x^3} + \log\left(\frac{ax}{\sqrt{a^2x^2+1}}\right) - \frac{\tan^{-1}(ax)^2}{2a^2x^2} - 7i\tan^{-1}(ax)\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) - \frac{7}{2}\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) + \frac{5}{8}\tan^{-1}(ax)^4 +\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^4*(c + a^2*c*x^2)^2),x]
```

```
[Out] (a^3*(((7*I)/24)*Pi^3 - ArcTan[a*x]/(a*x) - ArcTan[a*x]^2/2 - ArcTan[a*x]^2
/(2*a^2*x^2) - ((7*I)/3)*ArcTan[a*x]^3 - ArcTan[a*x]^3/(3*a^3*x^3) + (2*Arc
Tan[a*x]^3)/(a*x) + (5*ArcTan[a*x]^4)/8 - (3*Cos[2*ArcTan[a*x]])/16 + (3*Ar
cTan[a*x]^2*Cos[2*ArcTan[a*x]])/8 - 7*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTa
n[a*x])] + Log[(a*x)/Sqrt[1 + a^2*x^2]] - (7*I)*ArcTan[a*x]*PolyLog[2, E^((
-2*I)*ArcTan[a*x])] - (7*PolyLog[3, E^((-2*I)*ArcTan[a*x])])/2 - (3*ArcTan[
a*x]*Sin[2*ArcTan[a*x]])/8 + (ArcTan[a*x]^3*Sin[2*ArcTan[a*x]])/4))/c^2
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan\left(ax\right)^{3}}{a^{4}c^{2}x^{8}+2\,a^{2}c^{2}x^{6}+c^{2}x^{4}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^2,x, algorithm="fricas")
[Out] integral(arctan(a*x)^3/(a^4*c^2*x^8 + 2*a^2*c^2*x^6 + c^2*x^4), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [C] time = 5.13, size = 5190, normalized size = 15.63

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^2,x)
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{x^4\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)^2),x)
[Out] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(ax \right)}}{a^{4}x^{8}+2a^{2}x^{6}+x^{4}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**4/(a**2*c*x**2+c)**2,x)
[Out] Integral(atan(a*x)**3/(a**4*x**8 + 2*a**2*x**6 + x**4), x)/c**2
```

3.404 $\int \frac{x^3 \tan^{-1}(ax)^3}{(c+a^2cx^2)^3} \, dx$

Optimal. Leaf size=212

$$-\frac{3\tan^{-1}(ax)^3}{32a^4c^3}-\frac{27\tan^{-1}(ax)}{256a^4c^3}+\frac{x^4\tan^{-1}(ax)^3}{4c^3\left(a^2x^2+1\right)^2}-\frac{3x^4\tan^{-1}(ax)}{32c^3\left(a^2x^2+1\right)^2}-\frac{3x^3}{128ac^3\left(a^2x^2+1\right)^2}+\frac{3x^3\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)^2}+\frac{9\,\mathrm{ta}}{32a^4c^3}$$

```
[Out] -3/128*x^3/a/c^3/(a^2*x^2+1)^2-45/256*x/a^3/c^3/(a^2*x^2+1)-27/256*arctan(a
*x)/a^4/c^3-3/32*x^4*arctan(a*x)/c^3/(a^2*x^2+1)^2+9/32*arctan(a*x)/a^4/c^3
/(a^2*x^2+1)+3/16*x^3*arctan(a*x)^2/a/c^3/(a^2*x^2+1)^2+9/32*x*arctan(a*x)^
2/a^3/c^3/(a^2*x^2+1)-3/32*arctan(a*x)^3/a^4/c^3+1/4*x^4*arctan(a*x)^3/c^3/
(a^2*x^2+1)^2
```

Rubi [A] time = 0.29, antiderivative size = 212, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4944, 4940, 4936, 4930, 199, 205, 288}

$$-\frac{3x^3}{128ac^3\left(a^2x^2+1\right)^2}-\frac{45x}{256a^3c^3\left(a^2x^2+1\right)}+\frac{x^4\tan^{-1}(ax)^3}{4c^3\left(a^2x^2+1\right)^2}-\frac{3x^4\tan^{-1}(ax)}{32c^3\left(a^2x^2+1\right)^2}+\frac{3x^3\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)^2}+\frac{9x\tan^{-1}(ax)}{32a^3c^3\left(a^2x^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-3*x^3)/(128*a*c^3*(1 + a^2*x^2)^2) - (45*x)/(256*a^3*c^3*(1 + a^2*x^2)) -
 (27*ArcTan[a*x])/(256*a^4*c^3) - (3*x^4*ArcTan[a*x])/(32*c^3*(1 + a^2*x^2)
^2) + (9*ArcTan[a*x])/(32*a^4*c^3*(1 + a^2*x^2)) + (3*x^3*ArcTan[a*x]^2)/(1
6*a*c^3*(1 + a^2*x^2)^2) + (9*x*ArcTan[a*x]^2)/(32*a^3*c^3*(1 + a^2*x^2)) -
 (3*ArcTan[a*x]^3)/(32*a^4*c^3) + (x^4*ArcTan[a*x]^3)/(4*c^3*(1 + a^2*x^2)^
2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 288

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^
(n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*n*(p + 1)), x] - Dist[(c^
n*(m - n + 1))/(b*n*(p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^(p + 1), x], x]
 /; FreeQ[{a, b, c}, x] && IGtQ[n, 0] && LtQ[p, -1] && GtQ[m + 1, n] &&  !I
LtQ[(m + n*(p + 1) + 1)/n, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx = \frac{x^4 \tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2} - \frac{1}{4}(3a)\int \frac{x^4 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx$$

$$= -\frac{3x^4 \tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} + \frac{3x^3 \tan^{-1}(ax)^2}{16ac^3\left(1+a^2x^2\right)^2} + \frac{x^4 \tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2} + \frac{1}{32}(3a)\int \frac{x^4}{\left(c+a^2cx^2\right)^3}\,dx$$

$$= -\frac{3x^3}{128ac^3\left(1+a^2x^2\right)^2} - \frac{3x^4 \tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} + \frac{3x^3 \tan^{-1}(ax)^2}{16ac^3\left(1+a^2x^2\right)^2} + \frac{9x \tan^{-1}(ax)^2}{32a^3c^3\left(1+a^2x^2\right)} - \frac{3\,\mathrm{t}}{}$$

$$= -\frac{3x^3}{128ac^3\left(1+a^2x^2\right)^2} - \frac{9x}{256a^3c^3\left(1+a^2x^2\right)} - \frac{3x^4 \tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} + \frac{9 \tan^{-1}(ax)}{32a^4c^3\left(1+a^2x^2\right)} + -$$

$$= -\frac{3x^3}{128ac^3\left(1+a^2x^2\right)^2} - \frac{45x}{256a^3c^3\left(1+a^2x^2\right)} + \frac{9 \tan^{-1}(ax)}{256a^4c^3} - \frac{3x^4 \tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} + \frac{9\,\mathrm{tan}}{32a^4c^3}$$

$$= -\frac{3x^3}{128ac^3\left(1+a^2x^2\right)^2} - \frac{45x}{256a^3c^3\left(1+a^2x^2\right)} - \frac{27 \tan^{-1}(ax)}{256a^4c^3} - \frac{3x^4 \tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} + \frac{9\,\mathrm{ta}}{32a^4c^3}$$

Mathematica [A] time = 0.27, size = 105, normalized size = 0.50

$$\frac{-3ax\left(17a^2x^2+15\right)+24ax\left(5a^2x^2+3\right)\tan^{-1}(ax)^2+8\left(5a^4x^4-6a^2x^2-3\right)\tan^{-1}(ax)^3+\left(-51a^4x^4+18a^2x^2+45\right.}{256a^4c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-3*a*x*(15 + 17*a^2*x^2) + (45 + 18*a^2*x^2 - 51*a^4*x^4)*ArcTan[a*x] + 24
*a*x*(3 + 5*a^2*x^2)*ArcTan[a*x]^2 + 8*(-3 - 6*a^2*x^2 + 5*a^4*x^4)*ArcTan[
a*x]^3)/(256*a^4*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.82, size = 117, normalized size = 0.55

$$-\frac{51\,a^3x^3-8\left(5\,a^4x^4-6\,a^2x^2-3\right)\arctan\left(ax\right)^3-24\left(5\,a^3x^3+3\,ax\right)\arctan\left(ax\right)^2+45\,ax+3\left(17\,a^4x^4-6\,a^2x^2-1\right.}{256\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] -1/256*(51*a^3*x^3 - 8*(5*a^4*x^4 - 6*a^2*x^2 - 3)*arctan(a*x)^3 - 24*(5*a^
3*x^3 + 3*a*x)*arctan(a*x)^2 + 45*a*x + 3*(17*a^4*x^4 - 6*a^2*x^2 - 15)*arc
tan(a*x))/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 220, normalized size = 1.04

$$-\frac{\arctan\left(ax\right)^3}{2a^4c^3\left(a^2x^2+1\right)}+\frac{\arctan\left(ax\right)^3}{4a^4c^3\left(a^2x^2+1\right)^2}+\frac{15x^3\arctan\left(ax\right)^2}{32a\,c^3\left(a^2x^2+1\right)^2}+\frac{9\arctan\left(ax\right)^2x}{32a^3c^3\left(a^2x^2+1\right)^2}+\frac{5\arctan\left(ax\right)^3}{32a^4c^3}+\frac{15\arctan\left(ax\right)}{32a^4c^3\left(a^2x^2+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/2/a^4/c^3*arctan(a*x)^3/(a^2*x^2+1)+1/4/a^4/c^3*arctan(a*x)^3/(a^2*x^2+1
)^2+15/32*x^3*arctan(a*x)^2/a/c^3/(a^2*x^2+1)^2+9/32/a^3/c^3*arctan(a*x)^2*
x/(a^2*x^2+1)^2+5/32*arctan(a*x)^3/a^4/c^3+15/32*arctan(a*x)/a^4/c^3/(a^2*x
^2+1)-3/32/a^4/c^3*arctan(a*x)/(a^2*x^2+1)^2-51/256*x^3/a/c^3/(a^2*x^2+1)^2
-45/256/a^3/c^3/(a^2*x^2+1)^2*x-51/256*arctan(a*x)/a^4/c^3
```

maxima [A] time = 0.48, size = 289, normalized size = 1.36

$$\frac{3}{32}a\left(\frac{5\,a^2x^3+3\,x}{a^8c^3x^4+2\,a^6c^3x^2+a^4c^3}+\frac{5\,\arctan\left(ax\right)}{a^5c^3}\right)\arctan\left(ax\right)^2-\frac{\left(2\,a^2x^2+1\right)\arctan\left(ax\right)^3}{4\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}-\frac{1}{256}\left(\frac{\left(51\,a^3x^3-40\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 3/32*a*((5*a^2*x^3 + 3*x)/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3) + 5*arcta
n(a*x)/(a^5*c^3))*arctan(a*x)^2 - 1/4*(2*a^2*x^2 + 1)*arctan(a*x)^3/(a^8*c^
3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3) - 1/256*((51*a^3*x^3 - 40*(a^4*x^4 + 2*a^2
*x^2 + 1)*arctan(a*x)^3 + 45*a*x + 51*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)
)*a^2/(a^11*c^3*x^4 + 2*a^9*c^3*x^2 + a^7*c^3) - 24*(5*a^2*x^2 - 5*(a^4*x^4
 + 2*a^2*x^2 + 1)*arctan(a*x)^2 + 4)*a*arctan(a*x)/(a^10*c^3*x^4 + 2*a^8*c^
3*x^2 + a^6*c^3))*a
```

mupad [B] time = 0.59, size = 205, normalized size = 0.97

$$\frac{\operatorname{atan}(a\,x)^2\left(\frac{9\,x}{32\,a^5\,c^3}+\frac{15\,x^3}{32\,a^3\,c^3}\right)}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}-\operatorname{atan}(a\,x)^3\left(\frac{\frac{1}{4\,a^6\,c^3}+\frac{x^2}{2\,a^4\,c^3}}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}-\frac{5}{32\,a^4\,c^3}\right)-\frac{\frac{51\,a^2\,x^3}{8}+\frac{45\,x}{8}}{32\,a^7\,c^3\,x^4+64\,a^5\,c^3\,x^2+32\,a^3\,c^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^3,x)
```

```
[Out] (atan(a*x)^2*((9*x)/(32*a^5*c^3) + (15*x^3)/(32*a^3*c^3)))/(1/a^2 + 2*x^2 +
 a^2*x^4) - atan(a*x)^3*((1/(4*a^6*c^3) + x^2/(2*a^4*c^3))/(1/a^2 + 2*x^2 +
 a^2*x^4) - 5/(32*a^4*c^3)) - ((45*x)/8 + (51*a^2*x^3)/8)/(32*a^3*c^3 + 64*
a^5*c^3*x^2 + 32*a^7*c^3*x^4) - (51*atan(a*x))/(256*a^4*c^3) + (atan(a*x)*(
3/(8*a^6*c^3) + (15*x^2)/(32*a^4*c^3)))/(1/a^2 + 2*x^2 + a^2*x^4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3\operatorname{atan}^3(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**3/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**3*atan(a*x)**3/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/
c**3
```

3.405 $\int \frac{x^2 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=237

$$\frac{\tan^{-1}(ax)^4}{32a^3c^3} - \frac{3\tan^{-1}(ax)^2}{128a^3c^3} + \frac{x\tan^{-1}(ax)^3}{8a^2c^3\left(a^2x^2+1\right)} - \frac{x\tan^{-1}(ax)^3}{4a^2c^3\left(a^2x^2+1\right)^2} - \frac{3x\tan^{-1}(ax)}{64a^2c^3\left(a^2x^2+1\right)} + \frac{3x\tan^{-1}(ax)}{32a^2c^3\left(a^2x^2+1\right)^2} - \frac{\quad}{128a^3c^3}$$

```
[Out] 3/128/a^3/c^3/(a^2*x^2+1)^2-3/128/a^3/c^3/(a^2*x^2+1)+3/32*x*arctan(a*x)/a^
2/c^3/(a^2*x^2+1)^2-3/64*x*arctan(a*x)/a^2/c^3/(a^2*x^2+1)-3/128*arctan(a*x
)^2/a^3/c^3-3/16*arctan(a*x)^2/a^3/c^3/(a^2*x^2+1)^2+3/16*arctan(a*x)^2/a^3
/c^3/(a^2*x^2+1)-1/4*x*arctan(a*x)^3/a^2/c^3/(a^2*x^2+1)^2+1/8*x*arctan(a*x
)^3/a^2/c^3/(a^2*x^2+1)+1/32*arctan(a*x)^4/a^3/c^3
```

Rubi [A] time = 0.39, antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4964, 4892, 4930, 261, 4900, 4896}

$$-\frac{3}{128a^3c^3\left(a^2x^2+1\right)} + \frac{3}{128a^3c^3\left(a^2x^2+1\right)^2} + \frac{x\tan^{-1}(ax)^3}{8a^2c^3\left(a^2x^2+1\right)} - \frac{x\tan^{-1}(ax)^3}{4a^2c^3\left(a^2x^2+1\right)^2} + \frac{3\tan^{-1}(ax)^2}{16a^3c^3\left(a^2x^2+1\right)} - \frac{3\tan^{-1}(}{16a^3c^3\left(a^2x\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^3,x]
```

```
[Out] 3/(128*a^3*c^3*(1 + a^2*x^2)^2) - 3/(128*a^3*c^3*(1 + a^2*x^2)) + (3*x*ArcT
an[a*x])/(32*a^2*c^3*(1 + a^2*x^2)^2) - (3*x*ArcTan[a*x])/(64*a^2*c^3*(1 +
a^2*x^2)) - (3*ArcTan[a*x]^2)/(128*a^3*c^3) - (3*ArcTan[a*x]^2)/(16*a^3*c^3
*(1 + a^2*x^2)^2) + (3*ArcTan[a*x]^2)/(16*a^3*c^3*(1 + a^2*x^2)) - (x*ArcTa
n[a*x]^3)/(4*a^2*c^3*(1 + a^2*x^2)^2) + (x*ArcTan[a*x]^3)/(8*a^2*c^3*(1 + a
^2*x^2)) + ArcTan[a*x]^4/(32*a^3*c^3)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
```

```
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{x^2\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx}{a^2}+\frac{\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx}{a^2c}$$

$$= -\frac{3\tan^{-1}(ax)^2}{16a^3c^3\left(1+a^2x^2\right)^2}-\frac{x\tan^{-1}(ax)^3}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{x\tan^{-1}(ax)^3}{2a^2c^3\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^4}{8a^3c^3}+\frac{3\int \frac{\tan^{-1}(}{(c+a^2c}}{8a^2}$$

$$= \frac{3}{128a^3c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}-\frac{3\tan^{-1}(ax)^2}{16a^3c^3\left(1+a^2x^2\right)^2}+\frac{3\tan^{-1}(ax)^2}{4a^3c^3\left(1+a^2x^2\right)}-\frac{}{4}$$

$$= \frac{3}{128a^3c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}-\frac{39x\tan^{-1}(ax)}{64a^2c^3\left(1+a^2x^2\right)}-\frac{39\tan^{-1}(ax)^2}{128a^3c^3}-\frac{3}{16a^3}$$

$$= \frac{3}{128a^3c^3\left(1+a^2x^2\right)^2}-\frac{39}{128a^3c^3\left(1+a^2x^2\right)}+\frac{3x\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}-\frac{3x\tan^{-1}(ax)}{64a^2c^3\left(1+a^2x^2\right)}-$$

$$= \frac{3}{128a^3c^3\left(1+a^2x^2\right)^2}-\frac{3}{128a^3c^3\left(1+a^2x^2\right)}+\frac{3x\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}-\frac{3x\tan^{-1}(ax)}{64a^2c^3\left(1+a^2x^2\right)}-$$

Mathematica [A] time = 0.08, size = 111, normalized size = 0.47

$$\frac{\left(6ax-6a^3x^3\right)\tan^{-1}(ax)-3a^2x^2+4\left(a^2x^2+1\right)^2\tan^{-1}(ax)^4+16ax\left(a^2x^2-1\right)\tan^{-1}(ax)^3-3\left(a^4x^4-6a^2x^2+\right.}{128a^3c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-3*a^2*x^2 + (6*a*x - 6*a^3*x^3)*ArcTan[a*x] - 3*(1 - 6*a^2*x^2 + a^4*x^4)
*ArcTan[a*x]^2 + 16*a*x*(-1 + a^2*x^2)*ArcTan[a*x]^3 + 4*(1 + a^2*x^2)^2*Ar
cTan[a*x]^4)/(128*a^3*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.66, size = 130, normalized size = 0.55

$$\frac{4\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^4-3\,a^2x^2+16\left(a^3x^3-ax\right)\arctan\left(ax\right)^3-3\left(a^4x^4-6\,a^2x^2+1\right)\arctan\left(ax\right)^2-6}{128\left(a^7c^3x^4+2\,a^5c^3x^2+a^3c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/128*(4*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^4 - 3*a^2*x^2 + 16*(a^3*x^3
- a*x)*arctan(a*x)^3 - 3*(a^4*x^4 - 6*a^2*x^2 + 1)*arctan(a*x)^2 - 6*(a^3*x
^3 - a*x)*arctan(a*x))/(a^7*c^3*x^4 + 2*a^5*c^3*x^2 + a^3*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 216, normalized size = 0.91

$$\frac{\arctan\left(ax\right)^3x^3}{8c^3\left(a^2x^2+1\right)^2}-\frac{x\arctan\left(ax\right)^3}{8a^2c^3\left(a^2x^2+1\right)^2}+\frac{\arctan\left(ax\right)^4}{32a^3c^3}+\frac{3\arctan\left(ax\right)^2}{16a^3c^3\left(a^2x^2+1\right)}-\frac{3\arctan\left(ax\right)^2}{16a^3c^3\left(a^2x^2+1\right)^2}-\frac{3\arctan\left(ax\right)x^3}{64c^3\left(a^2x^2+1\right)^2}+\frac{3}{64a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/8/c^3*arctan(a*x)^3/(a^2*x^2+1)^2*x^3-1/8*x*arctan(a*x)^3/a^2/c^3/(a^2*x^
2+1)^2+1/32*arctan(a*x)^4/a^3/c^3+3/16*arctan(a*x)^2/a^3/c^3/(a^2*x^2+1)-3/
16*arctan(a*x)^2/a^3/c^3/(a^2*x^2+1)^2-3/64/c^3*arctan(a*x)/(a^2*x^2+1)^2*x
^3+3/64*x*arctan(a*x)/a^2/c^3/(a^2*x^2+1)^2-3/128*arctan(a*x)^2/a^3/c^3-3/1
28/a^3/c^3/(a^2*x^2+1)+3/128/a^3/c^3/(a^2*x^2+1)^2
```

maxima [A] time = 0.52, size = 334, normalized size = 1.41

$$\frac{1}{8}\left(\frac{a^2x^3-x}{a^6c^3x^4+2\,a^4c^3x^2+a^2c^3}+\frac{\arctan\left(ax\right)}{a^3c^3}\right)\arctan\left(ax\right)^3+\frac{3\left(a^2x^2-\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^2\right)a\arctan\left(a\right.}{16\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((a^2*x^3 - x)/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3) + arctan(a*x)/(a
^3*c^3))*arctan(a*x)^3 + 3/16*(a^2*x^2 - (a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a
*x)^2)*a*arctan(a*x)^2/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3) - 1/128*((4*
(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^4 + 3*a^2*x^2 - 3*(a^4*x^4 + 2*a^2*x^
2 + 1)*arctan(a*x)^2)*a^2/(a^10*c^3*x^4 + 2*a^8*c^3*x^2 + a^6*c^3) + 2*(3*a
^3*x^3 - 8*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^3 - 3*a*x + 3*(a^4*x^4 + 2
*a^2*x^2 + 1)*arctan(a*x))*a*arctan(a*x)/(a^9*c^3*x^4 + 2*a^7*c^3*x^2 + a^5
*c^3))*a
```

mupad [B] time = 0.54, size = 188, normalized size = 0.79

$$\frac{\operatorname{atan}(a\,x)\,\left(\frac{3\,x}{64\,a^4\,c^3}-\frac{3\,x^3}{64\,a^2\,c^3}\right)}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}-\frac{3\,x^2}{2\,\left(64\,a^5\,c^3\,x^4+128\,a^3\,c^3\,x^2+64\,a\,c^3\right)}-\operatorname{atan}(a\,x)^2\,\left(\frac{3}{128\,a^3\,c^3}-\frac{3\,x^2}{16\,a^3\,c^3\,\left(\frac{1}{a^2}+2\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^3,x)
```

```
[Out] (atan(a*x)*((3*x)/(64*a^4*c^3) - (3*x^3)/(64*a^2*c^3)))/(1/a^2 + 2*x^2 + a^
2*x^4) - (3*x^2)/(2*(64*a*c^3 + 128*a^3*c^3*x^2 + 64*a^5*c^3*x^4)) - atan(a
*x)^2*(3/(128*a^3*c^3) - (3*x^2)/(16*a^3*c^3*(1/a^2 + 2*x^2 + a^2*x^4))) -
(atan(a*x)^3*(x/(8*a^4*c^3) - x^3/(8*a^2*c^3)))/(1/a^2 + 2*x^2 + a^2*x^4) +
 atan(a*x)^4/(32*a^3*c^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2\operatorname{atan}^3(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**3/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**2*atan(a*x)**3/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/
c**3
```

3.406 $\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=208

$$-\frac{45x}{256ac^3\left(a^2x^2+1\right)}-\frac{3x}{128ac^3\left(a^2x^2+1\right)^2}-\frac{\tan^{-1}(ax)^3}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{9x\tan^{-1}(ax)^2}{32ac^3\left(a^2x^2+1\right)}+\frac{3x\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)^2}+\frac{9\tan^{-1}(ax}{32a^2c^3\left(a^2x^2\right.}$$

```
[Out] -3/128*x/a/c^3/(a^2*x^2+1)^2-45/256*x/a/c^3/(a^2*x^2+1)-45/256*arctan(a*x)/
a^2/c^3+3/32*arctan(a*x)/a^2/c^3/(a^2*x^2+1)^2+9/32*arctan(a*x)/a^2/c^3/(a^
2*x^2+1)+3/16*x*arctan(a*x)^2/a/c^3/(a^2*x^2+1)^2+9/32*x*arctan(a*x)^2/a/c^
3/(a^2*x^2+1)+3/32*arctan(a*x)^3/a^2/c^3-1/4*arctan(a*x)^3/a^2/c^3/(a^2*x^2
+1)^2
```

Rubi [A] time = 0.18, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4930, 4900, 4892, 199, 205}

$$-\frac{45x}{256ac^3\left(a^2x^2+1\right)}-\frac{3x}{128ac^3\left(a^2x^2+1\right)^2}-\frac{\tan^{-1}(ax)^3}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{9x\tan^{-1}(ax)^2}{32ac^3\left(a^2x^2+1\right)}+\frac{3x\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)^2}+\frac{9\tan^{-1}(ax}{32a^2c^3\left(a^2x^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-3*x)/(128*a*c^3*(1 + a^2*x^2)^2) - (45*x)/(256*a*c^3*(1 + a^2*x^2)) - (45
*ArcTan[a*x])/(256*a^2*c^3) + (3*ArcTan[a*x])/(32*a^2*c^3*(1 + a^2*x^2)^2)
+ (9*ArcTan[a*x])/(32*a^2*c^3*(1 + a^2*x^2)) + (3*x*ArcTan[a*x]^2)/(16*a*c^
3*(1 + a^2*x^2)^2) + (9*x*ArcTan[a*x]^2)/(32*a*c^3*(1 + a^2*x^2)) + (3*ArcT
an[a*x]^3)/(32*a^2*c^3) - ArcTan[a*x]^3/(4*a^2*c^3*(1 + a^2*x^2)^2)
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
```

```
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\tan^{-1}(ax)^3}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{3\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx}{4a}$$

$$= \frac{3\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan^{-1}(ax)^2}{16ac^3\left(1+a^2x^2\right)^2}-\frac{\tan^{-1}(ax)^3}{4a^2c^3\left(1+a^2x^2\right)^2}-\frac{3\int \frac{1}{\left(c+a^2cx^2\right)^3}\,dx}{32a}+\frac{9\int \frac{\tan}{(c+}}{1}$$

$$= -\frac{3x}{128ac^3\left(1+a^2x^2\right)^2}+\frac{3\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan^{-1}(ax)^2}{16ac^3\left(1+a^2x^2\right)^2}+\frac{9x\tan^{-1}(ax)^2}{32ac^3\left(1+a^2x^2\right)}+\frac{3\,\mathrm{t}}{}$$

$$= -\frac{3x}{128ac^3\left(1+a^2x^2\right)^2}-\frac{9x}{256ac^3\left(1+a^2x^2\right)}+\frac{3\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}+\frac{9\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)}+-\frac{}{1}$$

$$= -\frac{3x}{128ac^3\left(1+a^2x^2\right)^2}-\frac{45x}{256ac^3\left(1+a^2x^2\right)}-\frac{9\tan^{-1}(ax)}{256a^2c^3}+\frac{3\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}+\frac{9\tan}{32a^2c^3}$$

$$= -\frac{3x}{128ac^3\left(1+a^2x^2\right)^2}-\frac{45x}{256ac^3\left(1+a^2x^2\right)}-\frac{45\tan^{-1}(ax)}{256a^2c^3}+\frac{3\tan^{-1}(ax)}{32a^2c^3\left(1+a^2x^2\right)^2}+\frac{9\,\mathrm{ta}}{32a^2c^3}$$

Mathematica [A] time = 0.09, size = 103, normalized size = 0.50

$$\frac{-3ax\left(15a^2x^2+17\right)+24ax\left(3a^2x^2+5\right)\tan^{-1}(ax)^2+8\left(3a^4x^4+6a^2x^2-5\right)\tan^{-1}(ax)^3-3\left(15a^4x^4+6a^2x^2-\right.}{256c^3\left(a^3x^2+a\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-3*a*x*(17 + 15*a^2*x^2) - 3*(-17 + 6*a^2*x^2 + 15*a^4*x^4)*ArcTan[a*x] +
24*a*x*(5 + 3*a^2*x^2)*ArcTan[a*x]^2 + 8*(-5 + 6*a^2*x^2 + 3*a^4*x^4)*ArcTa
n[a*x]^3)/(256*c^3*(a + a^3*x^2)^2)
```

fricas [A] time = 0.43, size = 117, normalized size = 0.56

$$-\frac{45\,a^3x^3-8\left(3\,a^4x^4+6\,a^2x^2-5\right)\arctan\left(ax\right)^3-24\left(3\,a^3x^3+5\,ax\right)\arctan\left(ax\right)^2+51\,ax+3\left(15\,a^4x^4+6\,a^2x^2\right.}{256\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] -1/256*(45*a^3*x^3 - 8*(3*a^4*x^4 + 6*a^2*x^2 - 5)*arctan(a*x)^3 - 24*(3*a^
3*x^3 + 5*a*x)*arctan(a*x)^2 + 51*a*x + 3*(15*a^4*x^4 + 6*a^2*x^2 - 17)*arc
tan(a*x))/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 191, normalized size = 0.92

$$-\frac{\arctan (ax)^3}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3x\arctan (ax)^2}{16a\,c^3\left(a^2x^2+1\right)^2}+\frac{9x\arctan (ax)^2}{32a\,c^3\left(a^2x^2+1\right)}+\frac{3\arctan (ax)^3}{32a^2c^3}+\frac{9\arctan (ax)}{32a^2c^3\left(a^2x^2+1\right)}+\frac{3\arctan (ax)}{32a^2c^3\left(a^2x^2+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^3/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/4*arctan(a*x)^3/a^2/c^3/(a^2*x^2+1)^2+3/16*x*arctan(a*x)^2/a/c^3/(a^2*x^
2+1)^2+9/32*x*arctan(a*x)^2/a/c^3/(a^2*x^2+1)+3/32*arctan(a*x)^3/a^2/c^3+9/
32*arctan(a*x)/a^2/c^3/(a^2*x^2+1)+3/32*arctan(a*x)/a^2/c^3/(a^2*x^2+1)^2-4
5/256*a/c^3/(a^2*x^2+1)^2*x^3-51/256*x/a/c^3/(a^2*x^2+1)^2-45/256*arctan(a*
x)/a^2/c^3
```

maxima [A] time = 0.47, size = 272, normalized size = 1.31

$$\frac{3\left(\frac{3\,a^2x^3+5\,x}{a^4c^2x^4+2\,a^2c^2x^2+c^2}+\frac{3\,\arctan(ax)}{ac^2}\right)\arctan (ax)^2}{32\,ac}-\frac{3\left(\frac{\left(15\,a^3x^3-8\left(a^4x^4+2\,a^2x^2+1\right)\arctan(ax)^3+17\,ax+15\left(a^4x^4+2\,a^2x^2+1\right)\arctan(ax)\right)a^2}{a^7c^2x^4+2\,a^5c^2x^2+a^3c^2}\right.}{256\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 3/32*((3*a^2*x^3 + 5*x)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2) + 3*arctan(a*x)
/(a*c^2))*arctan(a*x)^2/(a*c) - 3/256*((15*a^3*x^3 - 8*(a^4*x^4 + 2*a^2*x^2
 + 1)*arctan(a*x)^3 + 17*a*x + 15*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x))*a^
2/(a^7*c^2*x^4 + 2*a^5*c^2*x^2 + a^3*c^2) - 8*(3*a^2*x^2 - 3*(a^4*x^4 + 2*a
^2*x^2 + 1)*arctan(a*x)^2 + 4)*a*arctan(a*x)/(a^6*c^2*x^4 + 2*a^4*c^2*x^2 +
 a^2*c^2))/(a*c) - 1/4*arctan(a*x)^3/((a^2*c*x^2 + c)^2*a^2*c)
```

mupad [B] time = 0.53, size = 189, normalized size = 0.91

$$\mathrm{atan}\left(a\,x\right)^3\,\left(\frac{3}{32\,a^2\,c^3}-\frac{1}{4\,a^4\,c^3\,\left(\frac{1}{a^2}+2\,x^2+a^2\,x^4\right)}\right)-\frac{\frac{45\,a^2\,x^3}{8}+\frac{51\,x}{8}}{32\,a^5\,c^3\,x^4+64\,a^3\,c^3\,x^2+32\,a\,c^3}+\frac{\mathrm{atan}\left(a\,x\right)^2\,\left(\frac{15\,x}{32\,a^3\,c^3}+\frac{9\,x^3}{32\,a\,c}\right.}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^3,x)
```

```
[Out] atan(a*x)^3*(3/(32*a^2*c^3) - 1/(4*a^4*c^3*(1/a^2 + 2*x^2 + a^2*x^4))) - ((
51*x)/8 + (45*a^2*x^3)/8)/(32*a*c^3 + 64*a^3*c^3*x^2 + 32*a^5*c^3*x^4) + (a
tan(a*x)^2*((15*x)/(32*a^3*c^3) + (9*x^3)/(32*a*c^3)))/(1/a^2 + 2*x^2 + a^2
```

```
*x^4) - (45*atan(a*x))/(256*a^2*c^3) + (atan(a*x)*(3/(8*a^4*c^3) + (9*x^2)/
(32*a^2*c^3)))/(1/a^2 + 2*x^2 + a^2*x^4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x\operatorname{atan}^3(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**3/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x*atan(a*x)**3/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c**
3
```

3.407 $\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=225

$$-\frac{45}{128ac^3\left(a^2x^2+1\right)}-\frac{3}{128ac^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)^3}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^3}{4c^3\left(a^2x^2+1\right)^2}+\frac{9\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)}+\frac{3\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)^2}-$$

```
[Out] -3/128/a/c^3/(a^2*x^2+1)^2-45/128/a/c^3/(a^2*x^2+1)-3/32*x*arctan(a*x)/c^3/
(a^2*x^2+1)^2-45/64*x*arctan(a*x)/c^3/(a^2*x^2+1)-45/128*arctan(a*x)^2/a/c^
3+3/16*arctan(a*x)^2/a/c^3/(a^2*x^2+1)^2+9/16*arctan(a*x)^2/a/c^3/(a^2*x^2+
1)+1/4*x*arctan(a*x)^3/c^3/(a^2*x^2+1)^2+3/8*x*arctan(a*x)^3/c^3/(a^2*x^2+1
)+3/32*arctan(a*x)^4/a/c^3
```

Rubi [A] time = 0.20, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4900, 4892, 4930, 261, 4896}

$$-\frac{45}{128ac^3\left(a^2x^2+1\right)}-\frac{3}{128ac^3\left(a^2x^2+1\right)^2}+\frac{3x\tan^{-1}(ax)^3}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^3}{4c^3\left(a^2x^2+1\right)^2}+\frac{9\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)}+\frac{3\tan^{-1}(ax)^2}{16ac^3\left(a^2x^2+1\right)^2}-$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(c + a^2*c*x^2)^3,x]
```

```
[Out] -3/(128*a*c^3*(1 + a^2*x^2)^2) - 45/(128*a*c^3*(1 + a^2*x^2)) - (3*x*ArcTan
[a*x])/(32*c^3*(1 + a^2*x^2)^2) - (45*x*ArcTan[a*x])/(64*c^3*(1 + a^2*x^2))
 - (45*ArcTan[a*x]^2)/(128*a*c^3) + (3*ArcTan[a*x]^2)/(16*a*c^3*(1 + a^2*x^
2)^2) + (9*ArcTan[a*x]^2)/(16*a*c^3*(1 + a^2*x^2)) + (x*ArcTan[a*x]^3)/(4*c
^3*(1 + a^2*x^2)^2) + (3*x*ArcTan[a*x]^3)/(8*c^3*(1 + a^2*x^2)) + (3*ArcTan
[a*x]^4)/(32*a*c^3)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
```

```
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx = \frac{3\tan^{-1}(ax)^2}{16ac^3\left(1+a^2x^2\right)^2}+\frac{x\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}-\frac{3}{8}\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx+\frac{3\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx}{4c}$$

$$= -\frac{3}{128ac^3\left(1+a^2x^2\right)^2}-\frac{3x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{3\tan^{-1}(ax)^2}{16ac^3\left(1+a^2x^2\right)^2}+\frac{x\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}+\frac{3x\tan}{8c^3\left(1\right.}$$

$$= -\frac{3}{128ac^3\left(1+a^2x^2\right)^2}-\frac{3x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{9x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}-\frac{9\tan^{-1}(ax)^2}{128ac^3}+\frac{3\tan^{-1}(}{16ac^3\left(1+\right.}$$

$$= -\frac{3}{128ac^3\left(1+a^2x^2\right)^2}-\frac{9}{128ac^3\left(1+a^2x^2\right)}-\frac{3x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{45x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}-\frac{45\tan}{128}$$

$$= -\frac{3}{128ac^3\left(1+a^2x^2\right)^2}-\frac{45}{128ac^3\left(1+a^2x^2\right)}-\frac{3x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{45x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}-\frac{45\tan}{128}$$

Mathematica [A] time = 0.06, size = 114, normalized size = 0.51

$$-\frac{45a^2x^2-12\left(a^2x^2+1\right)^2\tan^{-1}(ax)^4-16ax\left(3a^2x^2+5\right)\tan^{-1}(ax)^3+6ax\left(15a^2x^2+17\right)\tan^{-1}(ax)+3\left(15a^4x\right.}{128ac^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^3/(c + a^2*c*x^2)^3,x]
```

```
[Out] -1/128*(48 + 45*a^2*x^2 + 6*a*x*(17 + 15*a^2*x^2)*ArcTan[a*x] + 3*(-17 + 6*
a^2*x^2 + 15*a^4*x^4)*ArcTan[a*x]^2 - 16*a*x*(5 + 3*a^2*x^2)*ArcTan[a*x]^3
- 12*(1 + a^2*x^2)^2*ArcTan[a*x]^4)/(a*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.97, size = 132, normalized size = 0.59

$$\frac{12\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^4-45\,a^2x^2+16\left(3\,a^3x^3+5\,ax\right)\arctan\left(ax\right)^3-3\left(15\,a^4x^4+6\,a^2x^2-17\right)\mathrm{arc}}{128\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] 1/128*(12*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^4 - 45*a^2*x^2 + 16*(3*a^3*
x^3 + 5*a*x)*arctan(a*x)^3 - 3*(15*a^4*x^4 + 6*a^2*x^2 - 17)*arctan(a*x)^2
- 6*(15*a^3*x^3 + 17*a*x)*arctan(a*x) - 48)/(a^5*c^3*x^4 + 2*a^3*c^3*x^2 +
a*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.07, size = 211, normalized size = 0.94

$$\frac{x\arctan(ax)^3}{4c^3(a^2x^2+1)^2}+\frac{3x\arctan(ax)^3}{8c^3(a^2x^2+1)}+\frac{3\arctan(ax)^4}{32ac^3}+\frac{9\arctan(ax)^2}{16ac^3(a^2x^2+1)}+\frac{3\arctan(ax)^2}{16ac^3(a^2x^2+1)^2}-\frac{45a^2\arctan(ax)x^3}{64c^3(a^2x^2+1)^2}-\frac{5}{64}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/4*x*arctan(a*x)^3/c^3/(a^2*x^2+1)^2+3/8*x*arctan(a*x)^3/c^3/(a^2*x^2+1)+3
/32*arctan(a*x)^4/a/c^3+9/16*arctan(a*x)^2/a/c^3/(a^2*x^2+1)+3/16*arctan(a*
x)^2/a/c^3/(a^2*x^2+1)^2-45/64*a^2/c^3*arctan(a*x)/(a^2*x^2+1)^2*x^3-51/64*
x*arctan(a*x)/c^3/(a^2*x^2+1)^2-45/128*arctan(a*x)^2/a/c^3-45/128/a/c^3/(a^
2*x^2+1)-3/128/a/c^3/(a^2*x^2+1)^2
```

maxima [A] time = 0.52, size = 335, normalized size = 1.49

$$\frac{1}{8}\left(\frac{3a^2x^3+5x}{a^4c^3x^4+2a^2c^3x^2+c^3}+\frac{3\arctan(ax)}{ac^3}\right)\arctan(ax)^3+\frac{3\left(3a^2x^2-3\left(a^4x^4+2a^2x^2+1\right)\arctan(ax)^2+4\right)a\,\mathrm{ar}}{16\left(a^6c^3x^4+2a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((3*a^2*x^3 + 5*x)/(a^4*c^3*x^4 + 2*a^2*c^3*x^2 + c^3) + 3*arctan(a*x)/
(a*c^3))*arctan(a*x)^3 + 3/16*(3*a^2*x^2 - 3*(a^4*x^4 + 2*a^2*x^2 + 1)*arct
an(a*x)^2 + 4)*a*arctan(a*x)^2/(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3) - 3/
128*((4*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^4 + 15*a^2*x^2 - 15*(a^4*x^4
+ 2*a^2*x^2 + 1)*arctan(a*x)^2 + 16)*a^2/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4
*c^3) + 2*(15*a^3*x^3 - 8*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^3 + 17*a*x
+ 15*(a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x))*a*arctan(a*x)/(a^7*c^3*x^4 + 2*
a^5*c^3*x^2 + a^3*c^3))*a
```

mupad [B] time = 0.54, size = 199, normalized size = 0.88

$$\mathrm{atan}(a\,x)^2\left(\frac{\frac{3}{4\,a^3\,c^3}+\frac{9\,x^2}{16\,a\,c^3}}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}-\frac{45}{128\,a\,c^3}\right)-\frac{\frac{45\,a\,x^2}{2}+\frac{24}{a}}{64\,a^4\,c^3\,x^4+128\,a^2\,c^3\,x^2+64\,c^3}-\frac{\mathrm{atan}(a\,x)\left(\frac{45\,x^3}{64\,c^3}+\frac{51\,x}{64\,a^2\,c^3}\right)}{\frac{1}{a^2}+2\,x^2+a^2\,x^4}+\frac{\mathrm{atan}(a}{\frac{1}{a^2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(c + a^2*c*x^2)^3,x)
```

```
[Out] atan(a*x)^2*((3/(4*a^3*c^3) + (9*x^2)/(16*a*c^3))/(1/a^2 + 2*x^2 + a^2*x^4)
 - 45/(128*a*c^3)) - ((45*a*x^2)/2 + 24/a)/(64*c^3 + 128*a^2*c^3*x^2 + 64*a
^4*c^3*x^4) - (atan(a*x)*((45*x^3)/(64*c^3) + (51*x)/(64*a^2*c^3)))/(1/a^2
```

```
+ 2*x^2 + a^2*x^4) + (atan(a*x)^3*((3*x^3)/(8*c^3) + (5*x)/(8*a^2*c^3)))/(1
/a^2 + 2*x^2 + a^2*x^4) + (3*atan(a*x)^4)/(32*a*c^3)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^3(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**3/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c**3
```

3.408 $\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=332

$$\frac{141ax}{256c^3\left(a^2x^2+1\right)}+\frac{3ax}{128c^3\left(a^2x^2+1\right)^2}+\frac{\tan^{-1}(ax)^3}{2c^3\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^3}{4c^3\left(a^2x^2+1\right)^2}-\frac{33ax\tan^{-1}(ax)^2}{32c^3\left(a^2x^2+1\right)}-\frac{3ax\tan^{-1}(ax)^2}{16c^3\left(a^2x^2+1\right)^2}-\frac{33\,\mathrm{t}}{32c^3}$$

```
[Out] 3/128*a*x/c^3/(a^2*x^2+1)^2+141/256*a*x/c^3/(a^2*x^2+1)+141/256*arctan(a*x)
/c^3-3/32*arctan(a*x)/c^3/(a^2*x^2+1)^2-33/32*arctan(a*x)/c^3/(a^2*x^2+1)-3
/16*a*x*arctan(a*x)^2/c^3/(a^2*x^2+1)^2-33/32*a*x*arctan(a*x)^2/c^3/(a^2*x^
2+1)-11/32*arctan(a*x)^3/c^3+1/4*arctan(a*x)^3/c^3/(a^2*x^2+1)^2+1/2*arctan
(a*x)^3/c^3/(a^2*x^2+1)-1/4*I*arctan(a*x)^4/c^3+arctan(a*x)^3*ln(2-2/(1-I*a
*x))/c^3-3/2*I*arctan(a*x)^2*polylog(2,-1+2/(1-I*a*x))/c^3+3/2*arctan(a*x)*
polylog(3,-1+2/(1-I*a*x))/c^3+3/4*I*polylog(4,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 0.71, antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 12, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.546, Rules used = {4966, 4924, 4868, 4884, 4992, 4996, 6610, 4930, 4892, 199, 205, 4900}

$$\frac{3i\text{PolyLog}\left(4,-1+\frac{2}{1-iax}\right)}{4c^3}-\frac{3i\tan^{-1}(ax)^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^3}+\frac{3\tan^{-1}(ax)\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^3}+\frac{14}{256c^3\,(}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] (3*a*x)/(128*c^3*(1 + a^2*x^2)^2) + (141*a*x)/(256*c^3*(1 + a^2*x^2)) + (14
1*ArcTan[a*x])/(256*c^3) - (3*ArcTan[a*x])/(32*c^3*(1 + a^2*x^2)^2) - (33*A
rcTan[a*x])/(32*c^3*(1 + a^2*x^2)) - (3*a*x*ArcTan[a*x]^2)/(16*c^3*(1 + a^2
*x^2)^2) - (33*a*x*ArcTan[a*x]^2)/(32*c^3*(1 + a^2*x^2)) - (11*ArcTan[a*x]^
3)/(32*c^3) + ArcTan[a*x]^3/(4*c^3*(1 + a^2*x^2)^2) + ArcTan[a*x]^3/(2*c^3*
(1 + a^2*x^2)) - ((I/4)*ArcTan[a*x]^4)/c^3 + (ArcTan[a*x]^3*Log[2 - 2/(1 -
I*a*x)])/c^3 - (((3*I)/2)*ArcTan[a*x]^2*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^3
 + (3*ArcTan[a*x]*PolyLog[3, -1 + 2/(1 - I*a*x)])/(2*c^3) + (((3*I)/4)*Poly
Log[4, -1 + 2/(1 - I*a*x)])/c^3
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
```

```
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4996

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}-\frac{1}{4}(3a)\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx+\frac{\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)}\,dx}{c^2}-\frac{a^2\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{3\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{3ax\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2}+\frac{\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}+\frac{\tan^{-1}(ax)^3}{2c^3\left(1+a^2x^2\right)}-\frac{i\tan^{-1}(ax)^4}{4c^3}+$$

$$= \frac{3ax}{128c^3\left(1+a^2x^2\right)^2}-\frac{3\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{3ax\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2}-\frac{33ax\tan^{-1}(ax)^2}{32c^3\left(1+a^2x^2\right)}-\frac{11\tan^{-1}(ax}{32c^3}$$

$$= \frac{3ax}{128c^3\left(1+a^2x^2\right)^2}+\frac{9ax}{256c^3\left(1+a^2x^2\right)}-\frac{3\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{33\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)}-\frac{3ax\tan^{-1}(}{16c^3\left(1+a^2\right.}$$

$$= \frac{3ax}{128c^3\left(1+a^2x^2\right)^2}+\frac{141ax}{256c^3\left(1+a^2x^2\right)}+\frac{9\tan^{-1}(ax)}{256c^3}-\frac{3\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{33\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)}$$

$$= \frac{3ax}{128c^3\left(1+a^2x^2\right)^2}+\frac{141ax}{256c^3\left(1+a^2x^2\right)}+\frac{141\tan^{-1}(ax)}{256c^3}-\frac{3\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{33\tan^{-1}(ax}{32c^3\left(1+a^2x\right.}$$

Mathematica [A] time = 0.33, size = 208, normalized size = 0.63

$$1536i\tan^{-1}(ax)^2\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)+1536\tan^{-1}(ax)\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)-768i\text{Li}_4\left(e^{-2i\tan^{-1}(ax)}\right)+256i\tan^{-1}(ax)^4+$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] ((-16*I)*Pi^4 + (256*I)*ArcTan[a*x]^4 - 576*ArcTan[a*x]*Cos[2*ArcTan[a*x]]
+ 384*ArcTan[a*x]^3*Cos[2*ArcTan[a*x]] - 12*ArcTan[a*x]*Cos[4*ArcTan[a*x]]
+ 32*ArcTan[a*x]^3*Cos[4*ArcTan[a*x]] + 1024*ArcTan[a*x]^3*Log[1 - E^((-2*I
)*ArcTan[a*x])] + (1536*I)*ArcTan[a*x]^2*PolyLog[2, E^((-2*I)*ArcTan[a*x])]
 + 1536*ArcTan[a*x]*PolyLog[3, E^((-2*I)*ArcTan[a*x])] - (768*I)*PolyLog[4,
 E^((-2*I)*ArcTan[a*x])] + 288*Sin[2*ArcTan[a*x]] - 576*ArcTan[a*x]^2*Sin[2
```

```
*ArcTan[a*x]] + 3*Sin[4*ArcTan[a*x]] - 24*ArcTan[a*x]^2*Sin[4*ArcTan[a*x]])
/(1024*c^3)
```

fricas [F] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^3}{a^6c^3x^7 + 3\,a^4c^3x^5 + 3\,a^2c^3x^3 + c^3x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.57, size = 2157, normalized size = 6.50

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/4*arctan(a*x)^3/c^3/(a^2*x^2+1)^2+1/2*arctan(a*x)^3/c^3/(a^2*x^2+1)-1/4*I
*arctan(a*x)^4/c^3+1/c^3*arctan(a*x)^3*ln(a*x)-1/2/c^3*arctan(a*x)^3*ln(a^2
*x^2+1)-9/32*I/c^3*arctan(a*x)/(I+a*x)+9/32*I/c^3*arctan(a*x)/(a*x-I)+1/2*I
/c^3*Pi*arctan(a*x)^3-3*I/c^3*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)
^(1/2))-3*I/c^3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c^3
*arctan(a*x)^3*ln(2)+1/c^3*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+
6/c^3*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+1/c^3*arctan(a*x)
^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6/c^3*arctan(a*x)*polylog(3,(1+I*a*x)/
(a^2*x^2+1)^(1/2))-3/256/c^3*arctan(a*x)*cos(4*arctan(a*x))-1/c^3*arctan(a*
x)^3*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+1/c^3*arctan(a*x)^3*ln((1+I*a*x)/(a^2*x^
2+1)^(1/2))-3/128/c^3*sin(4*arctan(a*x))*arctan(a*x)^2-9/4/c^3*arctan(a*x)^
2/(8*a*x-8*I)-9/4/c^3*arctan(a*x)^2/(8*I+8*a*x)+6*I/c^3*polylog(4,(1+I*a*x)
/(a^2*x^2+1)^(1/2))+6*I/c^3*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-11/32*a
rctan(a*x)^3/c^3-1/2*I/c^3*Pi*arctan(a*x)^3*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)
-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/4*
I/c^3*Pi*arctan(a*x)^3*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(
a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-1/2*I/c^3*arctan(a*x)^3*Pi*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+9/4
*I/c^3*arctan(a*x)^2/(8*a*x-8*I)*a*x-9/4*I/c^3*arctan(a*x)^2/(8*I+8*a*x)*a*
x+1/4*I/c^3*Pi*arctan(a*x)^3*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*(
(1+I*a*x)^2/(a^2*x^2+1)+1)^2)-1/2*I/c^3*Pi*arctan(a*x)^3*csgn(I*((1+I*a*x)^
2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)
-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+1/2*I/c^3*Pi*arctan(a*x)^3*csgn(I*(1+I*a
*x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2-1/2*I/c^3*Pi*arcta
n(a*x)^3*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1
)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-1/4*I/c^3*Pi*arctan(a*x)^3*csgn(I*(1+I*
a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))+1/2*I/c^3*Pi*arct
an(a*x)^3*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*c
sgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+1/4*I/c^3*arct
```

```
an(a*x)^3*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*
x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+9/4/c^3/(16*I+16*a*x)+9/4/c^3/(16*a
*x-16*I)+3/1024/c^3*sin(4*arctan(a*x))+9/32/c^3*arctan(a*x)/(I+a*x)*a*x+9/3
2/c^3*arctan(a*x)/(a*x-I)*a*x-1/4*I/c^3*Pi*arctan(a*x)^3*csgn(I*(1+I*a*x)^2
/(a^2*x^2+1))^3-1/2*I/c^3*arctan(a*x)^3*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)
/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-1/4*I/c^3*arctan(a*x)^3*Pi*csgn(I*(1+I*a*x)
^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+1/4*I/c^3*Pi*arctan(a*x)^3*
csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3-1/4*I/c^3*Pi*arctan(a*x)^3*csgn(I/(
(1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a
*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+1/2*I/c^3*Pi*arctan(a*x)^3
*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*cs
gn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+1/2*I/c^3*Pi*
arctan(a*x)^3*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1
))^3+1/2*I/c^3*Pi*arctan(a*x)^3*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)
^2/(a^2*x^2+1)+1))^3+9/4*I/c^3/(16*I+16*a*x)*a*x-9/4*I/c^3/(16*a*x-16*I)*a*
x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^3}{\left(a^2cx^2+c\right)^3 x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{x\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^3(ax)}{a^6x^7+3a^4x^5+3a^2x^3+x}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**3/(a**6*x**7 + 3*a**4*x**5 + 3*a**2*x**3 + x), x)/c**3
```

3.409 $\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=332

$$\frac{93a}{128c^3\left(a^2x^2+1\right)}+\frac{3a}{128c^3\left(a^2x^2+1\right)^2}-\frac{7a^2x\tan^{-1}(ax)^3}{8c^3\left(a^2x^2+1\right)}-\frac{a^2x\tan^{-1}(ax)^3}{4c^3\left(a^2x^2+1\right)^2}-\frac{21a\tan^{-1}(ax)^2}{16c^3\left(a^2x^2+1\right)}-\frac{3a\tan^{-1}(ax)^2}{16c^3\left(a^2x^2+1\right)^2}+\frac{9}{6}$$

```
[Out] 3/128*a/c^3/(a^2*x^2+1)^2+93/128*a/c^3/(a^2*x^2+1)+3/32*a^2*x*arctan(a*x)/c
^3/(a^2*x^2+1)^2+93/64*a^2*x*arctan(a*x)/c^3/(a^2*x^2+1)+93/128*a*arctan(a*
x)^2/c^3-3/16*a*arctan(a*x)^2/c^3/(a^2*x^2+1)^2-21/16*a*arctan(a*x)^2/c^3/(
a^2*x^2+1)-I*a*arctan(a*x)^3/c^3-arctan(a*x)^3/c^3/x-1/4*a^2*x*arctan(a*x)^
3/c^3/(a^2*x^2+1)^2-7/8*a^2*x*arctan(a*x)^3/c^3/(a^2*x^2+1)-15/32*a*arctan(
a*x)^4/c^3+3*a*arctan(a*x)^2*ln(2-2/(1-I*a*x))/c^3-3*I*a*arctan(a*x)*polylo
g(2,-1+2/(1-I*a*x))/c^3+3/2*a*polylog(3,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 0.75, antiderivative size = 332, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.591, Rules used = {4966, 4918, 4852, 4924, 4868, 4884, 4992, 6610, 4892, 4930, 261, 4900, 4896}

$$\frac{3a\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{2c^3}-\frac{3ia\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^3}+\frac{93a}{128c^3\left(a^2x^2+1\right)}+\frac{3a}{128c^3\left(a^2x^2+1\right)^2}-\frac{7a^2}{8c^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^3),x]
```

```
[Out] (3*a)/(128*c^3*(1 + a^2*x^2)^2) + (93*a)/(128*c^3*(1 + a^2*x^2)) + (3*a^2*x
*ArcTan[a*x])/(32*c^3*(1 + a^2*x^2)^2) + (93*a^2*x*ArcTan[a*x])/(64*c^3*(1
+ a^2*x^2)) + (93*a*ArcTan[a*x]^2)/(128*c^3) - (3*a*ArcTan[a*x]^2)/(16*c^3*
(1 + a^2*x^2)^2) - (21*a*ArcTan[a*x]^2)/(16*c^3*(1 + a^2*x^2)) - (I*a*ArcTa
n[a*x]^3)/c^3 - ArcTan[a*x]^3/(c^3*x) - (a^2*x*ArcTan[a*x]^3)/(4*c^3*(1 + a
^2*x^2)^2) - (7*a^2*x*ArcTan[a*x]^3)/(8*c^3*(1 + a^2*x^2)) - (15*a*ArcTan[a
*x]^4)/(32*c^3) + (3*a*ArcTan[a*x]^2*Log[2 - 2/(1 - I*a*x)])/c^3 - ((3*I)*a
*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)])/c^3 + (3*a*PolyLog[3, -1 + 2/(
1 - I*a*x)])/(2*c^3)
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
```

```
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
```

```
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{3a\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2}-\frac{a^2x\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}+\frac{1}{8}\left(3a^2\right)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx+\frac{\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)}\,dx}{c^2}-$$

$$= \frac{3a}{128c^3\left(1+a^2x^2\right)^2}+\frac{3a^2x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}-\frac{3a\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2}-\frac{a^2x\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}-\frac{7a^2x\tan}{8c^3(1}$$

$$= \frac{3a}{128c^3\left(1+a^2x^2\right)^2}+\frac{3a^2x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{9a^2x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}+\frac{9a\tan^{-1}(ax)^2}{128c^3}-\frac{3a\tan^{-1}}{16c^3(1+}$$

$$= \frac{3a}{128c^3\left(1+a^2x^2\right)^2}+\frac{9a}{128c^3\left(1+a^2x^2\right)}+\frac{3a^2x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{93a^2x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}+\frac{93a\,\mathrm{ta}}{12}$$

$$= \frac{3a}{128c^3\left(1+a^2x^2\right)^2}+\frac{93a}{128c^3\left(1+a^2x^2\right)}+\frac{3a^2x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{93a^2x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}+\frac{93a\,\mathrm{ta}}{12}$$

$$= \frac{3a}{128c^3\left(1+a^2x^2\right)^2}+\frac{93a}{128c^3\left(1+a^2x^2\right)}+\frac{3a^2x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{93a^2x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}+\frac{93a\,\mathrm{ta}}{12}$$

$$= \frac{3a}{128c^3\left(1+a^2x^2\right)^2}+\frac{93a}{128c^3\left(1+a^2x^2\right)}+\frac{3a^2x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{93a^2x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)}+\frac{93a\,\mathrm{ta}}{12}$$

Mathematica [A] time = 0.57, size = 232, normalized size = 0.70

$$a\left(-\frac{ax\tan^{-1}(ax)^3}{a^2x^2+1}+3i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)+\frac{3}{2}\mathrm{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)-\frac{15}{32}\tan^{-1}(ax)^4-\frac{\tan^{-1}(ax)^3}{ax}+i\tan^{-1}(ax)^3\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^3),x]
```

```
[Out] (a*((-1/8*I)*Pi^3 + I*ArcTan[a*x]^3 - ArcTan[a*x]^3/(a*x) - (a*x*ArcTan[a*x
]^3)/(1 + a^2*x^2) - (15*ArcTan[a*x]^4)/32 + (3*Cos[2*ArcTan[a*x]])/8 - (3*
ArcTan[a*x]^2*Cos[2*ArcTan[a*x]])/4 + (3*Cos[4*ArcTan[a*x]])/1024 - (3*ArcT
an[a*x]^2*Cos[4*ArcTan[a*x]])/128 + 3*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTa
n[a*x])] + (3*I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] + (3*PolyLo
g[3, E^((-2*I)*ArcTan[a*x])])/2 + (3*ArcTan[a*x]*Sin[2*ArcTan[a*x]])/4 + (3
*ArcTan[a*x]*Sin[4*ArcTan[a*x]])/256 - (ArcTan[a*x]^3*Sin[4*ArcTan[a*x]])/3
2))/c^3
```

fricas [F] time = 0.78, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan\left(ax\right)^{3}}{a^{6}c^{3}x^{8}+3\,a^{4}c^{3}x^{6}+3\,a^{2}c^{3}x^{4}+c^{3}x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4 + c^3*x
^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.45, size = 2115, normalized size = 6.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^3,x)
```

```
[Out] 93/128*a*arctan(a*x)^2/c^3-arctan(a*x)^3/c^3/x-15/32*a*arctan(a*x)^4/c^3-3/
8*I/c^3*arctan(a*x)/(a*x-I)*a^2*x+3/8*I/c^3*arctan(a*x)/(I+a*x)*a^2*x+3/2*I
*a/c^3*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^
2*x^2+1)+1))^3-3/4*I*a/c^3*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))
^3+3/2*I*a/c^3*Pi*arctan(a*x)^2*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)
^2/(a^2*x^2+1)+1))^3-3/2*I*a/c^3*Pi*arctan(a*x)^2*csgn(((1+I*a*x)^2/(a^2*x^
2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/4*I*a/c^3*Pi*arctan(a*x)^2*csgn(I*
((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3-3/4*I*a/c^3*Pi*arctan(a*x)^2*csgn(I*(1+I*a
*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3-3/4*I*a/c^3*Pi*arctan(a*
x)^2*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))+
3/8*a/c^3*arctan(a*x)/(I+a*x)+3*a/c^3*arctan(a*x)^2*ln(a*x)-3*a/c^3*arctan(
a*x)^2*ln((1+I*a*x)^2/(a^2*x^2+1)-1)+3/256*a/c^3*arctan(a*x)*sin(4*arctan(a
*x))-3/16/c^3/(a*x-I)*a^2*x-3/16/c^3/(I+a*x)*a^2*x+3/2*I*a/c^3*Pi*arctan(a*
x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn((
(1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))-3/2*I*a/c^3*Pi*arct
an(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+
1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-3/2*I*a/c^3*Pi*arctan(a*x)^2*csgn(I*((
1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a
^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/4*I*a/c^3*Pi*arctan(a*x)^2*cs
gn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(
```

```
a^2*x^2+1)+1)^2)^2+3/1024*a/c^3*cos(4*arctan(a*x))+6*a/c^3*polylog(3,-(1+I*
a*x)/(a^2*x^2+1)^(1/2))+6*a/c^3*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*
a/c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/2*I*a/c^3*Pi*arc
tan(a*x)^2-7/8/c^3*arctan(a*x)^3/(a^2*x^2+1)^2*a^4*x^3-6*I*a/c^3*arctan(a*x
)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3/4*I*a/c^3*Pi*arctan(a*x)^2*csgn
(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)-3/2
*I*a/c^3*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*
a*x)^2/(a^2*x^2+1)+1)^2)^2+3/2*I*a/c^3*Pi*arctan(a*x)^2*csgn(I*(1+I*a*x)/(a
^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2-3/2*I*a/c^3*Pi*arctan(a*
x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)
/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+3/4*I*a/c^3*Pi*arctan(a*x)^2*csgn(I/((1+I*a
*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^
2+1)+1)^2)^2+3*a/c^3*arctan(a*x)^2*ln(2)+3/16*I*a/c^3/(I+a*x)-3/16*I*a/c^3/
(a*x-I)-3/16*a*arctan(a*x)^2/c^3/(a^2*x^2+1)^2-21/16*a*arctan(a*x)^2/c^3/(a
^2*x^2+1)-I*a*arctan(a*x)^3/c^3-3/4*I*a/c^3*Pi*arctan(a*x)^2*csgn(I/((1+I*a
*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/
(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+3/2*I*a/c^3*Pi*arctan(a*x)^2*csg
n(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I
*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))-9/8*a^2*x*arctan(
a*x)^3/c^3/(a^2*x^2+1)^2+3*a/c^3*arctan(a*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/
2))-3/2*a/c^3*arctan(a*x)^2*ln(a^2*x^2+1)+3*a/c^3*arctan(a*x)^2*ln(1+(1+I*a
*x)/(a^2*x^2+1)^(1/2))+3*a/c^3*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/
2))+3/8*a/c^3*arctan(a*x)/(a*x-I)
```

maxima [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3}{x^2\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^3), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(a x \right)}}{a^{6} x^{8} + 3 a^{4} x^{6} + 3 a^{2} x^{4} + x^{2}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**2/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**3/(a**6*x**8 + 3*a**4*x**6 + 3*a**2*x**4 + x**2), x)/c*
*3
```

3.410 $\int \frac{\tan^{-1}(ax)^3}{x^3(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=478

$$-\frac{3ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)}{2c^3}-\frac{9ia^2\text{Li}_4\left(\frac{2}{1-iax}-1\right)}{4c^3}+\frac{9ia^2\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)^2}{2c^3}-\frac{9a^2\text{Li}_3\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{2c^3}-\frac{a^2\tan^{-1}}{c^3\left(a^2x^2\right.}$$

```
[Out] -3/128*a^3*x/c^3/(a^2*x^2+1)^2-237/256*a^3*x/c^3/(a^2*x^2+1)-237/256*a^2*ar
ctan(a*x)/c^3+3/32*a^2*arctan(a*x)/c^3/(a^2*x^2+1)^2+57/32*a^2*arctan(a*x)/
c^3/(a^2*x^2+1)+3/4*I*a^2*arctan(a*x)^4/c^3-3/2*a*arctan(a*x)^2/c^3/x+3/16*
a^3*x*arctan(a*x)^2/c^3/(a^2*x^2+1)^2+57/32*a^3*x*arctan(a*x)^2/c^3/(a^2*x^
2+1)+3/32*a^2*arctan(a*x)^3/c^3-1/2*arctan(a*x)^3/c^3/x^2-1/4*a^2*arctan(a*
x)^3/c^3/(a^2*x^2+1)^2-a^2*arctan(a*x)^3/c^3/(a^2*x^2+1)+9/2*I*a^2*arctan(a
*x)^2*polylog(2,-1+2/(1-I*a*x))/c^3+3*a^2*arctan(a*x)*ln(2-2/(1-I*a*x))/c^3
-3*a^2*arctan(a*x)^3*ln(2-2/(1-I*a*x))/c^3-3/2*I*a^2*arctan(a*x)^2/c^3-3/2*
I*a^2*polylog(2,-1+2/(1-I*a*x))/c^3-9/2*a^2*arctan(a*x)*polylog(3,-1+2/(1-I
*a*x))/c^3-9/4*I*a^2*polylog(4,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 1.84, antiderivative size = 478, normalized size of antiderivative = 1.00, number of steps used = 47, number of rules used = 15, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.682, Rules used = {4966, 4918, 4852, 4924, 4868, 2447, 4884, 4992, 4996, 6610, 4930, 4892, 199, 205, 4900}

$$-\frac{3ia^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^3}-\frac{9ia^2\text{PolyLog}\left(4,-1+\frac{2}{1-iax}\right)}{4c^3}+\frac{9ia^2\tan^{-1}(ax)^2\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{2c^3}-\frac{9a^2\tan^{-1}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^3*(c + a^2*c*x^2)^3),x]
```

```
[Out] (-3*a^3*x)/(128*c^3*(1 + a^2*x^2)^2) - (237*a^3*x)/(256*c^3*(1 + a^2*x^2))
- (237*a^2*ArcTan[a*x])/(256*c^3) + (3*a^2*ArcTan[a*x])/(32*c^3*(1 + a^2*x^
2)^2) + (57*a^2*ArcTan[a*x])/(32*c^3*(1 + a^2*x^2)) - (((3*I)/2)*a^2*ArcTan
[a*x]^2)/c^3 - (3*a*ArcTan[a*x]^2)/(2*c^3*x) + (3*a^3*x*ArcTan[a*x]^2)/(16*
c^3*(1 + a^2*x^2)^2) + (57*a^3*x*ArcTan[a*x]^2)/(32*c^3*(1 + a^2*x^2)) + (3
*a^2*ArcTan[a*x]^3)/(32*c^3) - ArcTan[a*x]^3/(2*c^3*x^2) - (a^2*ArcTan[a*x]
^3)/(4*c^3*(1 + a^2*x^2)^2) - (a^2*ArcTan[a*x]^3)/(c^3*(1 + a^2*x^2)) + (((
3*I)/4)*a^2*ArcTan[a*x]^4)/c^3 + (3*a^2*ArcTan[a*x]*Log[2 - 2/(1 - I*a*x)])
/c^3 - (3*a^2*ArcTan[a*x]^3*Log[2 - 2/(1 - I*a*x)])/c^3 - (((3*I)/2)*a^2*Po
lyLog[2, -1 + 2/(1 - I*a*x)])/c^3 + (((9*I)/2)*a^2*ArcTan[a*x]^2*PolyLog[2,
 -1 + 2/(1 - I*a*x)])/c^3 - (9*a^2*ArcTan[a*x]*PolyLog[3, -1 + 2/(1 - I*a*x
)])/(2*c^3) - (((9*I)/4)*a^2*PolyLog[4, -1 + 2/(1 - I*a*x)])/c^3
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 4996

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*PolyLog[k_, u_])/((d_) + (e_.
)*(x_)^2), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[k + 1, u])/(
2*c*d), x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[k + 1
, u])/(d + e*x^2), x], x] /; FreeQ[{a, b, c, d, e, k}, x] && IGtQ[p, 0] &&
EqQ[e, c^2*d] && EqQ[u^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^3\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^3}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x^3\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= a^4\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx+\frac{\int \frac{\tan^{-1}(ax)^3}{x^3\left(c+a^2cx^2\right)}\,dx}{c^2}-2\frac{a^2\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= -\frac{a^2\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}+\frac{1}{4}\left(3a^3\right)\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^3}\,dx+\frac{\int \frac{\tan^{-1}(ax)^3}{x^3}\,dx}{c^3}-\frac{a^2\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)}\,dx}{c^2}-$$

$$= \frac{3a^2\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{3a^3x\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2}-\frac{\tan^{-1}(ax)^3}{2c^3x^2}-\frac{a^2\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2}+\frac{ia^2\tan^{-1}(ax)^4}{4c^3}$$

$$= -\frac{3a^3x}{128c^3\left(1+a^2x^2\right)^2}+\frac{3a^2\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{3a^3x\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2}+\frac{9a^3x\tan^{-1}(ax)^2}{32c^3\left(1+a^2x^2\right)}+\frac{3a^2 \text{t}}{}$$

$$= -\frac{3a^3x}{128c^3\left(1+a^2x^2\right)^2}-\frac{9a^3x}{256c^3\left(1+a^2x^2\right)}+\frac{3a^2\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{9a^2\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)}-\frac{3a\tan}{2}$$

$$= -\frac{3a^3x}{128c^3\left(1+a^2x^2\right)^2}-\frac{45a^3x}{256c^3\left(1+a^2x^2\right)}-\frac{9a^2\tan^{-1}(ax)}{256c^3}+\frac{3a^2\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{9a^2\tan}{32c^3(1}$$

$$= -\frac{3a^3x}{128c^3\left(1+a^2x^2\right)^2}-\frac{45a^3x}{256c^3\left(1+a^2x^2\right)}-\frac{45a^2\tan^{-1}(ax)}{256c^3}+\frac{3a^2\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{9a^2\text{t}}{32c^3(}$$

$$= -\frac{3a^3x}{128c^3\left(1+a^2x^2\right)^2}-\frac{45a^3x}{256c^3\left(1+a^2x^2\right)}-\frac{45a^2\tan^{-1}(ax)}{256c^3}+\frac{3a^2\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2}+\frac{9a^2\text{t}}{32c^3(}$$

Mathematica [A] time = 1.10, size = 295, normalized size = 0.62

$$\frac{a^2\left(-\frac{512\left(a^2x^2+1\right)\tan^{-1}(ax)^3}{a^2x^2}-4608i\tan^{-1}(ax)^2\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right)-4608\tan^{-1}(ax)\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right)-1536i\text{Li}_2\left(e^{2}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^3*(c + a^2*c*x^2)^3),x]
```

```
[Out] (a^2*((48*I)*Pi^4 - (1536*I)*ArcTan[a*x]^2 - (1536*ArcTan[a*x]^2)/(a*x) - (
512*(1 + a^2*x^2)*ArcTan[a*x]^3)/(a^2*x^2) - (768*I)*ArcTan[a*x]^4 + 960*Ar
cTan[a*x]*Cos[2*ArcTan[a*x]] - 640*ArcTan[a*x]^3*Cos[2*ArcTan[a*x]] + 12*Ar
cTan[a*x]*Cos[4*ArcTan[a*x]] - 32*ArcTan[a*x]^3*Cos[4*ArcTan[a*x]] - 3072*A
rcTan[a*x]^3*Log[1 - E^((-2*I)*ArcTan[a*x])] + 3072*ArcTan[a*x]*Log[1 - E^(
(2*I)*ArcTan[a*x])] - (4608*I)*ArcTan[a*x]^2*PolyLog[2, E^((-2*I)*ArcTan[a*
x])] - (1536*I)*PolyLog[2, E^((2*I)*ArcTan[a*x])] - 4608*ArcTan[a*x]*PolyLo
g[3, E^((-2*I)*ArcTan[a*x])] + (2304*I)*PolyLog[4, E^((-2*I)*ArcTan[a*x])]
```

```
- 480*Sin[2*ArcTan[a*x]] + 960*ArcTan[a*x]^2*Sin[2*ArcTan[a*x]] - 3*Sin[4*A
rcTan[a*x]] + 24*ArcTan[a*x]^2*Sin[4*ArcTan[a*x]]))/(1024*c^3)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^3}{a^6c^3x^9 + 3\,a^4c^3x^7 + 3\,a^2c^3x^5 + c^3x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/(a^6*c^3*x^9 + 3*a^4*c^3*x^7 + 3*a^2*c^3*x^5 + c^3*x
^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 11.53, size = 891, normalized size = 1.86

$$-\frac{\arctan(ax)^3}{2c^3x^2}-\frac{a^2\arctan(ax)^3}{2c^3}-\frac{3a^2\arctan(ax)^3\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{c^3}-\frac{3a^2\arctan(ax)^3\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)}{c^3}+\frac{3a^2\,\text{arcta}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/2*arctan(a*x)^3/c^3/x^2-1/2*a^2*arctan(a*x)^3/c^3-15/32*a^3/c^3/(I+a*x)*
arctan(a*x)*x+5/16*a^3/c^3/(a*x-I)*arctan(a*x)^3*x-15/32*a^3/c^3/(a*x-I)*ar
ctan(a*x)*x-15/32*I*a^2/c^3/(a*x-I)*arctan(a*x)+9*I*a^2/c^3*arctan(a*x)^2*p
olylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+9*I*a^2/c^3*arctan(a*x)^2*polylog(2,
(1+I*a*x)/(a^2*x^2+1)^(1/2))-5/16*I*a^2/c^3/(I+a*x)*arctan(a*x)^3+15/32*I*a
^2/c^3/(I+a*x)*arctan(a*x)+5/16*I*a^2/c^3/(a*x-I)*arctan(a*x)^3-15/64*I*a^3
/c^3/(I+a*x)*x+15/64*I*a^3/c^3/(a*x-I)*x+5/16*a^3/c^3/(I+a*x)*arctan(a*x)^3
*x+3/256*a^2*arctan(a*x)/c^3*cos(4*arctan(a*x))-3*a^2/c^3*arctan(a*x)^3*ln(
1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-18*a^2/c^3*arctan(a*x)*polylog(3,(1+I*a*x)/(
a^2*x^2+1)^(1/2))-3*a^2/c^3*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))
-18*a^2/c^3*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2/c^3*a
rctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*a^2/c^3*arctan(a*x)*ln(1+(1+
I*a*x)/(a^2*x^2+1)^(1/2))-1/32*a^2*arctan(a*x)^3/c^3*cos(4*arctan(a*x))+3/1
28*a^2/c^3*sin(4*arctan(a*x))*arctan(a*x)^2+15/32*a^2/c^3/(I+a*x)*arctan(a*
x)^2+15/32*a^2/c^3/(a*x-I)*arctan(a*x)^2-18*I*a^2/c^3*polylog(4,(1+I*a*x)/(
a^2*x^2+1)^(1/2))-3*I*a^2/c^3*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-18*I*a
^2/c^3*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*a^2/c^3*polylog(2,-(1+I*
a*x)/(a^2*x^2+1)^(1/2))+15/32*I*a^3/c^3/(I+a*x)*arctan(a*x)^2*x-15/32*I*a^3
/c^3/(a*x-I)*arctan(a*x)^2*x-15/64*a^2/c^3/(I+a*x)-15/64*a^2/c^3/(a*x-I)-3/
1024*a^2/c^3*sin(4*arctan(a*x))+3/4*I*a^2*arctan(a*x)^4/c^3-3/2*a*arctan(a*
x)^2/c^3/x-3/2*I*a^2*arctan(a*x)^2/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^3}{\left(a^2cx^2 + c\right)^3 x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^3*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{x^3\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(ax \right)}}{a^{6}x^{9}+3a^{4}x^{7}+3a^{2}x^{5}+x^{3}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**3/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**3/(a**6*x**9 + 3*a**4*x**7 + 3*a**2*x**5 + x**3), x)/c*
*3
```

3.411 $\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=432

$$-\frac{5a^3\text{Li}_3\left(\frac{2}{1-iax}-1\right)}{c^3}+\frac{10ia^3\text{Li}_2\left(\frac{2}{1-iax}-1\right)\tan^{-1}(ax)}{c^3}+\frac{a^3\log(x)}{c^3}+\frac{35a^3\tan^{-1}(ax)^4}{32c^3}+\frac{10ia^3\tan^{-1}(ax)^3}{3c^3}-\frac{205a^3\tan^{-1}}{128c^3}$$

```
[Out] -3/128*a^3/c^3/(a^2*x^2+1)^2-141/128*a^3/c^3/(a^2*x^2+1)-a^2*arctan(a*x)/c^
3/x-3/32*a^4*x*arctan(a*x)/c^3/(a^2*x^2+1)^2-141/64*a^4*x*arctan(a*x)/c^3/(
a^2*x^2+1)-205/128*a^3*arctan(a*x)^2/c^3-1/2*a*arctan(a*x)^2/c^3/x^2+3/16*a
^3*arctan(a*x)^2/c^3/(a^2*x^2+1)^2+33/16*a^3*arctan(a*x)^2/c^3/(a^2*x^2+1)+
10*I*a^3*arctan(a*x)*polylog(2,-1+2/(1-I*a*x))/c^3-1/3*arctan(a*x)^3/c^3/x^
3+3*a^2*arctan(a*x)^3/c^3/x+1/4*a^4*x*arctan(a*x)^3/c^3/(a^2*x^2+1)^2+11/8*
a^4*x*arctan(a*x)^3/c^3/(a^2*x^2+1)+35/32*a^3*arctan(a*x)^4/c^3+a^3*ln(x)/c
^3-1/2*a^3*ln(a^2*x^2+1)/c^3-10*a^3*arctan(a*x)^2*ln(2-2/(1-I*a*x))/c^3+10/
3*I*a^3*arctan(a*x)^3/c^3-5*a^3*polylog(3,-1+2/(1-I*a*x))/c^3
```

Rubi [A] time = 2.16, antiderivative size = 432, normalized size of antiderivative = 1.00, number of steps used = 57, number of rules used = 17, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.773, Rules used = {4966, 4918, 4852, 266, 36, 29, 31, 4884, 4924, 4868, 4992, 6610, 4892, 4930, 261, 4900, 4896}

$$-\frac{5a^3\text{PolyLog}\left(3,-1+\frac{2}{1-iax}\right)}{c^3}+\frac{10ia^3\tan^{-1}(ax)\text{PolyLog}\left(2,-1+\frac{2}{1-iax}\right)}{c^3}-\frac{141a^3}{128c^3\left(a^2x^2+1\right)}-\frac{3a^3}{128c^3\left(a^2x^2+1\right)^2}-\frac{a^3}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^4*(c + a^2*c*x^2)^3),x]
```

```
[Out] (-3*a^3)/(128*c^3*(1 + a^2*x^2)^2) - (141*a^3)/(128*c^3*(1 + a^2*x^2)) - (a
^2*ArcTan[a*x])/(c^3*x) - (3*a^4*x*ArcTan[a*x])/(32*c^3*(1 + a^2*x^2)^2) -
(141*a^4*x*ArcTan[a*x])/(64*c^3*(1 + a^2*x^2)) - (205*a^3*ArcTan[a*x]^2)/(1
28*c^3) - (a*ArcTan[a*x]^2)/(2*c^3*x^2) + (3*a^3*ArcTan[a*x]^2)/(16*c^3*(1
+ a^2*x^2)^2) + (33*a^3*ArcTan[a*x]^2)/(16*c^3*(1 + a^2*x^2)) + (((10*I)/3)
*a^3*ArcTan[a*x]^3)/c^3 - ArcTan[a*x]^3/(3*c^3*x^3) + (3*a^2*ArcTan[a*x]^3)
/(c^3*x) + (a^4*x*ArcTan[a*x]^3)/(4*c^3*(1 + a^2*x^2)^2) + (11*a^4*x*ArcTan
[a*x]^3)/(8*c^3*(1 + a^2*x^2)) + (35*a^3*ArcTan[a*x]^4)/(32*c^3) + (a^3*Log
[x])/c^3 - (a^3*Log[1 + a^2*x^2])/(2*c^3) - (10*a^3*ArcTan[a*x]^2*Log[2 - 2
/(1 - I*a*x)])/c^3 + ((10*I)*a^3*ArcTan[a*x]*PolyLog[2, -1 + 2/(1 - I*a*x)]
)/c^3 - (5*a^3*PolyLog[3, -1 + 2/(1 - I*a*x)])/c^3
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 4992

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d), x
] - Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
+ e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d
] && EqQ[(1 - u)^2 - (1 - (2*I)/(I + c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)^3}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^3}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= a^4\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)^3}{x^4\left(c+a^2cx^2\right)}\,dx}{c^2} - 2\frac{a^2\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^2}\,dx}{c}$$

$$= \frac{3a^3\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2} + \frac{a^4x\tan^{-1}(ax)^3}{4c^3\left(1+a^2x^2\right)^2} - \frac{1}{8}\left(3a^4\right)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^3}\,dx + \frac{\int \frac{\tan^{-1}(ax)^3}{x^4}\,dx}{c^3} - \cdots$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} + \frac{3a^3\tan^{-1}(ax)^2}{16c^3\left(1+a^2x^2\right)^2} - \frac{\tan^{-1}(ax)^3}{3c^3x^3} + \frac{a^4x\tan^{-1}(\cdots}{4c^3\left(1+a^2\cdots\right.}$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} - \frac{9a^4x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)} - \frac{9a^3\tan^{-1}(ax)^2}{128c^3} + \frac{3a^3\tan\cdots}{16c^3\left(1\cdots\right.}$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{9a^3}{128c^3\left(1+a^2x^2\right)} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} - \frac{45a^4x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)} - \frac{45a^3\cdots}{\cdots}$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{45a^3}{128c^3\left(1+a^2x^2\right)} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} - \frac{45a^4x\tan^{-1}(ax)}{64c^3\left(1+a^2x^2\right)} - \frac{45a^3\cdots}{\cdots}$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{45a^3}{128c^3\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^3x} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} - \frac{45a^4x\tan\cdots}{64c^3\left(1+\cdots\right.}$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{45a^3}{128c^3\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^3x} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} - \frac{45a^4x\tan\cdots}{64c^3\left(1+\cdots\right.}$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{45a^3}{128c^3\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^3x} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} - \frac{45a^4x\tan\cdots}{64c^3\left(1+\cdots\right.}$$

$$= -\frac{3a^3}{128c^3\left(1+a^2x^2\right)^2} - \frac{45a^3}{128c^3\left(1+a^2x^2\right)} - \frac{a^2\tan^{-1}(ax)}{c^3x} - \frac{3a^4x\tan^{-1}(ax)}{32c^3\left(1+a^2x^2\right)^2} - \frac{45a^4x\tan\cdots}{64c^3\left(1+\cdots\right.}$$

Mathematica [A] time = 1.22, size = 301, normalized size = 0.70

$$\frac{a^3\left(-\frac{\tan^{-1}(ax)^3}{3a^3x^3} + \log\left(\frac{ax}{\sqrt{a^2x^2+1}}\right) - \frac{\tan^{-1}(ax)^2}{2a^2x^2} - 10i\tan^{-1}(ax)\text{Li}_2\left(e^{-2i\tan^{-1}(ax)}\right) - 5\text{Li}_3\left(e^{-2i\tan^{-1}(ax)}\right) + \frac{35}{32}\tan^{-1}(ax\cdots\right.}{\cdots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^4*(c + a^2*c*x^2)^3),x]
```

[Out] (a^3*(((5*I)/12)*Pi^3 - ArcTan[a*x]/(a*x) - ArcTan[a*x]^2/2 - ArcTan[a*x]^2/(2*a^2*x^2) - ((10*I)/3)*ArcTan[a*x]^3 - ArcTan[a*x]^3/(3*a^3*x^3) + (3*ArcTan[a*x]^3)/(a*x) + (35*ArcTan[a*x]^4)/32 - (9*Cos[2*ArcTan[a*x]])/16 + (9*ArcTan[a*x]^2*Cos[2*ArcTan[a*x]])/8 - (3*Cos[4*ArcTan[a*x]])/1024 + (3*ArcTan[a*x]^2*Cos[4*ArcTan[a*x]])/128 - 10*ArcTan[a*x]^2*Log[1 - E^((-2*I)*ArcTan[a*x])] + Log[(a*x)/Sqrt[1 + a^2*x^2]] - (10*I)*ArcTan[a*x]*PolyLog[2, E^((-2*I)*ArcTan[a*x])] - 5*PolyLog[3, E^((-2*I)*ArcTan[a*x])] - (9*ArcTan[a*x]*Sin[2*ArcTan[a*x]])/8 + (3*ArcTan[a*x]^3*Sin[2*ArcTan[a*x]])/4 - (3*ArcTan[a*x]*Sin[4*ArcTan[a*x]])/256 + (ArcTan[a*x]^3*Sin[4*ArcTan[a*x]])/32))/c^3

fricas [F] time = 1.16, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(ax)^3}{a^6c^3x^{10} + 3\,a^4c^3x^8 + 3\,a^2c^3x^6 + c^3x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^3,x, algorithm="fricas")

[Out] integral(arctan(a*x)^3/(a^6*c^3*x^10 + 3*a^4*c^3*x^8 + 3*a^2*c^3*x^6 + c^3*x^4), x)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^3,x, algorithm="giac")

[Out] sage0*x

maple [C] time = 5.11, size = 2319, normalized size = 5.37

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^3,x)

[Out] -5*I*a^3/c^3*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+5/2*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)-a^2*arctan(a*x)/c^3/x-205/128*a^3*arctan(a*x)^2/c^3-1/3*arctan(a*x)^3/c^3/x^3-5/2*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-5*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))^2+5*I*a^3/c^3*Pi*arctan(a*x)^2*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2+5*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-5*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))+5/2*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)/(a^2*x^2+1)^(1/2))^2*csgn(I*(1+I*a*x)^2/(a^2*x^2+1))+11/8*a^6/c^3*arctan(a*x)^3/(a^2*x^2+1)^2*x^3+20*I*a^3/c^3*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+20*I*a^3/c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-5*I*a^3/c^3*Pi*arctan(a*x)^2+5*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2-5/2*I*a^3/c^3*Pi*arctan(a*x)^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1))^2*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)+1)^2)+5*I*a^3/c

```
^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^
2+1)+1))*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-5/
2*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)*csgn(I*(
1+I*a*x)^2/(a^2*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^2+9/32*I*a^3/c^3/(a*x
-I)-9/32*I*a^3/c^3/(I+a*x)-I*a^3/c^3*arctan(a*x)+9/8*I*a^4/c^3*arctan(a*x)/
(2*a*x-2*I)*x-9/8*I*a^4/c^3*arctan(a*x)/(2*I+2*a*x)*x+5*I*a^3/c^3*Pi*arctan
(a*x)^2*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^2*x^2+1)+1))^2-5*I
*a^3/c^3*arctan(a*x)^2*Pi*csgn(((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*a*x)^2/(a^
2*x^2+1)+1))^3+5/2*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2*x^2+1
))^3-5*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2/(a^2*x^2+1)-1)/((1+I*
a*x)^2/(a^2*x^2+1)+1))^3-5/2*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*((1+I*a*x)^2
/(a^2*x^2+1)+1)^2)^3+5/2*I*a^3/c^3*arctan(a*x)^2*Pi*csgn(I*(1+I*a*x)^2/(a^2
*x^2+1)/((1+I*a*x)^2/(a^2*x^2+1)+1)^2)^3+a^3/c^3*ln((1+I*a*x)/(a^2*x^2+1)^(
1/2)-1)-20*a^3/c^3*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-20*a^3/c^3*polyl
og(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+a^3/c^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))
-3/1024*a^3/c^3*cos(4*arctan(a*x))+5*a^3/c^3*arctan(a*x)^2*ln(a^2*x^2+1)-10
*a^3/c^3*arctan(a*x)^2*ln(a*x)+10*a^3/c^3*arctan(a*x)^2*ln((1+I*a*x)^2/(a^2
*x^2+1)-1)-3/256*a^3/c^3*arctan(a*x)*sin(4*arctan(a*x))-10*a^3/c^3*arctan(a
*x)^2*ln((1+I*a*x)/(a^2*x^2+1)^(1/2))-10*a^3/c^3*arctan(a*x)^2*ln(1+(1+I*a*
x)/(a^2*x^2+1)^(1/2))-10*a^3/c^3*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(
1/2))-10*a^3/c^3*arctan(a*x)^2*ln(2)-9/8*a^3/c^3*arctan(a*x)/(2*a*x-2*I)-9/
8*a^3/c^3*arctan(a*x)/(2*I+2*a*x)+9/32*a^4/c^3/(a*x-I)*x+9/32*a^4/c^3/(I+a*
x)*x-1/2*a*arctan(a*x)^2/c^3/x^2+3/16*a^3*arctan(a*x)^2/c^3/(a^2*x^2+1)^2+3
3/16*a^3*arctan(a*x)^2/c^3/(a^2*x^2+1)+3*a^2*arctan(a*x)^3/c^3/x+13/8*a^4*x
*arctan(a*x)^3/c^3/(a^2*x^2+1)^2+10/3*I*a^3*arctan(a*x)^3/c^3+35/32*a^3*arc
tan(a*x)^4/c^3
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3}{x^4\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{3}{\left(a x \right)}}{a^{6} x^{10} + 3 a^{4} x^{8} + 3 a^{2} x^{6} + x^{4}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**4/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**3/(a**6*x**10 + 3*a**4*x**8 + 3*a**2*x**6 + x**4), x)/c
**3
```

3.412 $\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=523

$$\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{15a^2}+\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{10a^2}+\frac{1}{5}x^4\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3-\frac{3x^3\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{20a}+\frac{11}{}$$

```
[Out] 1/2*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))*c^(1/2)/a^4-11/20*I*c*arctan((
1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+
c)^(1/2)+11/20*I*c*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a
^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-11/20*I*c*arctan(a*x)*polylog(2,I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-11/20
*c*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x
^2+c)^(1/2)+11/20*c*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1
/2)/a^4/(a^2*c*x^2+c)^(1/2)-1/20*x*(a^2*c*x^2+c)^(1/2)/a^3-9/20*arctan(a*x)
*(a^2*c*x^2+c)^(1/2)/a^4+1/10*x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2+1/8*x
*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^3-3/20*x^3*arctan(a*x)^2*(a^2*c*x^2+c)
^(1/2)/a-2/15*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^4+1/15*x^2*arctan(a*x)^3*
(a^2*c*x^2+c)^(1/2)/a^2+1/5*x^4*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 2.44, antiderivative size = 523, normalized size of antiderivative = 1.00, number of steps used = 71, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589, 321}

$$\frac{11ic\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{20a^4\sqrt{a^2cx^2+c}}-\frac{11ic\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{20a^4\sqrt{a^2cx^2+c}}-\frac{11c\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] -(x*Sqrt[c + a^2*c*x^2])/(20*a^3) - (9*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(20
*a^4) + (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(10*a^2) + (x*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x]^2)/(8*a^3) - (3*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(20
*a) - (((11*I)/20)*c*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x
]^2)/(a^4*Sqrt[c + a^2*c*x^2]) - (2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(15*
a^4) + (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(15*a^2) + (x^4*Sqrt[c + a^2
*c*x^2]*ArcTan[a*x]^3)/5 + (Sqrt[c]*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^
2]])/(2*a^4) + (((11*I)/20)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)
*E^(I*ArcTan[a*x])])/(a^4*Sqrt[c + a^2*c*x^2]) - (((11*I)/20)*c*Sqrt[1 + a^
2*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^4*Sqrt[c + a^2*c*x^2
]) - (11*c*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(20*a^4*Sq
rt[c + a^2*c*x^2]) + (11*c*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])
])/(20*a^4*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
```

```
IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3\,dx = c\int \frac{x^3\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{x^5\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{3a^2} + \frac{1}{5}x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3 - \frac{1}{5}(4c)\int \frac{x^3\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3} - \frac{3x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{20a} - \frac{2\sqrt{c+a^2cx^2}\tan^{-1}(a}{3a^4}$$

$$= \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a^4} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{10a^2} + \frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a^3} -$$

$$= -\frac{x\sqrt{c+a^2cx^2}}{20a^3} - \frac{9\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^4} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{10a^2} + \frac{x\sqrt{c+a}}{}$$

$$= -\frac{x\sqrt{c+a^2cx^2}}{20a^3} - \frac{9\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^4} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{10a^2} + \frac{x\sqrt{c+a}}{}$$

$$= -\frac{x\sqrt{c+a^2cx^2}}{20a^3} - \frac{9\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^4} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{10a^2} + \frac{x\sqrt{c+a}}{}$$

$$= -\frac{x\sqrt{c+a^2cx^2}}{20a^3} - \frac{9\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^4} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{10a^2} + \frac{x\sqrt{c+a}}{}$$

$$= -\frac{x\sqrt{c+a^2cx^2}}{20a^3} - \frac{9\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^4} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{10a^2} + \frac{x\sqrt{c+a}}{}$$

$$= -\frac{x\sqrt{c+a^2cx^2}}{20a^3} - \frac{9\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^4} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{10a^2} + \frac{x\sqrt{c+a}}{}$$

Mathematica [A] time = 1.22, size = 262, normalized size = 0.50

$$\sqrt{a^2cx^2+c}\left(-\left(a^2x^2+1\right)^2\left(\frac{48ax}{\left(a^2x^2+1\right)^2}+\tan^{-1}(ax)^2\left(6\sin\left(2\tan^{-1}(ax)\right)-33\sin\left(4\tan^{-1}(ax)\right)\right)+32\tan^{-1}(ax)^3\left(5\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*((48*((-11*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2
+ 10*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] + (11*I)*ArcTan[a*x]*PolyLog[2, (-I)*
E^(I*ArcTan[a*x])] - (11*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - 1
1*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 11*PolyLog[3, I*E^(I*ArcTan[a*x])]))
/Sqrt[1 + a^2*x^2] - (1 + a^2*x^2)^2*((48*a*x)/(1 + a^2*x^2)^2 + 32*ArcTan[
a*x]^3*(-1 + 5*Cos[2*ArcTan[a*x]]) + 6*ArcTan[a*x]*(25 + 36*Cos[2*ArcTan[a*
x]] + 11*Cos[4*ArcTan[a*x]]) + ArcTan[a*x]^2*(6*Sin[2*ArcTan[a*x]] - 33*Sin
[4*ArcTan[a*x]]))))/(960*a^4)
```

fricas [F] time = 0.92, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x^3\arctan(ax)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.76, size = 417, normalized size = 0.80

$$\frac{\sqrt{c(ax-i)(ax+i)}\,\left(24\arctan(ax)^3x^4a^4-18\arctan(ax)^2x^3a^3+8\arctan(ax)^3x^2a^2+12\arctan(ax)a^2x^2+\right.}{120a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/120/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(24*arctan(a*x)^3*x^4*a^4-18*arctan(a*x
)^2*x^3*a^3+8*arctan(a*x)^3*x^2*a^2+12*arctan(a*x)*a^2*x^2+15*arctan(a*x)^2
*x*a-16*arctan(a*x)^3-6*a*x-54*arctan(a*x))-11/120*(c*(a*x-I)*(I+a*x))^(1/2
)*(I*arctan(a*x)^3+6*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
-3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(3,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2)))/a^4/(a^2*x^2+1)^(1/2)+11/120*(c*(a*x-I)*(I+a*x))^(1/2
)*(I*arctan(a*x)^3-3*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*
arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(3,-I*(1+I*a
*x)/(a^2*x^2+1)^(1/2)))/a^4/(a^2*x^2+1)^(1/2)-I/a^4*(c*(a*x-I)*(I+a*x))^(1/
2)*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{a^2cx^2+c}\,x^3\arctan(ax)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^3*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 \operatorname{atan}(a\,x)^3\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^3\sqrt{c\left(a^2x^2+1\right)}\,\operatorname{atan}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**3*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3, x)
```

3.413 $\int x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=747

$$\frac{x\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3}{8a^2}-\frac{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}{4a}+\frac{x\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{4a^2}+\frac{1}{4}x^3\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3-\frac{ic\sqrt{}}{}$$

```
[Out] 3/4*I*c*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^
2*c*x^2+c)^(1/2)-3/4*I*c*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+
1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+I*c*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-
I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-1/2*I*c*polylog(2,-
I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2
)+3/8*I*c*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1
)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/4*I*c*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))
*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+3/4*c*arctan(a*x)*
polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+
c)^(1/2)-3/4*c*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^
2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+1/2*I*c*polylog(2,I*(1+I*a*x)^(1/2)/(1-I
*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3/8*I*c*arctan(a*x)^
2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^
2+c)^(1/2)-1/4*(a^2*c*x^2+c)^(1/2)/a^3+1/4*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2
)/a^2+1/8*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^3-1/4*x^2*arctan(a*x)^2*(a^2*
c*x^2+c)^(1/2)/a+1/8*x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^2+1/4*x^3*arctan
(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.85, antiderivative size = 747, normalized size of antiderivative = 1.00, number of steps used = 40, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4952, 4930, 4890, 4886, 4888, 4181, 2531, 6609, 2282, 6589, 261}

$$-\frac{ic\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a^3\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a^3\sqrt{a^2cx^2+c}}-\frac{3ic\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{PolyLog}(}{8a^3\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] -Sqrt[c + a^2*c*x^2]/(4*a^3) + (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(4*a^2)
+ (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(8*a^3) - (x^2*Sqrt[c + a^2*c*x^2]*Ar
cTan[a*x]^2)/(4*a) + (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(8*a^2) + (x^3*S
qrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/4 + ((I/4)*c*Sqrt[1 + a^2*x^2]*ArcTan[E^(
I*ArcTan[a*x])]*ArcTan[a*x]^3)/(a^3*Sqrt[c + a^2*c*x^2]) + (I*c*Sqrt[1 + a^
2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a
^2*c*x^2]) - (((3*I)/8)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E
^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + (((3*I)/8)*c*Sqrt[1 + a^2*x^
2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2])
 - ((I/2)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*
a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + ((I/2)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, (I
*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + (3*c*Sqrt[1
 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(4*a^3*Sqrt[c +
 a^2*c*x^2]) - (3*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[
a*x])])/(4*a^3*Sqrt[c + a^2*c*x^2]) + (((3*I)/4)*c*Sqrt[1 + a^2*x^2]*PolyLo
g[4, (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) - (((3*I)/4)*c*Sqrt
[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
```

```
NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] && !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx = c\int \frac{x^2\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{x^4\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2} + \frac{1}{4}x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{1}{4}(3c)\int \frac{x^2\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{4a} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax}{8a^2}$$

$$= \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{4a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{8a^3} - \frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{4a}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{4a^3} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{4a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{8a^3} - \frac{x^2\sqrt{c+a^2}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{4a^3} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{4a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{8a^3} - \frac{x^2\sqrt{c+a^2}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{4a^3} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{4a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{8a^3} - \frac{x^2\sqrt{c+a^2}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{4a^3} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{4a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{8a^3} - \frac{x^2\sqrt{c+a^2}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{4a^3} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{4a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{8a^3} - \frac{x^2\sqrt{c+a^2}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}}{4a^3} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{4a^2} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{8a^3} - \frac{x^2\sqrt{c+a^2}}{}$$

Mathematica [B] time = 12.13, size = 1844, normalized size = 2.47

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] ((Sqrt[c*(1 + a^2*x^2)]*(-1 + ArcTan[a*x]^2))/(4*Sqrt[1 + a^2*x^2]) + (Sqrt
[c*(1 + a^2*x^2)]*(-(ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*
E^(I*ArcTan[a*x])])) - I*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2, I
*E^(I*ArcTan[a*x])])))/(2*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*(-1/8
*(Pi^3*Log[Cot[(Pi/2 - ArcTan[a*x])/2]]) - (3*Pi^2*((Pi/2 - ArcTan[a*x])*(L
og[1 - E^(I*(Pi/2 - ArcTan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) +
 I*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTa
n[a*x]))])))/4 + (3*Pi*((Pi/2 - ArcTan[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcTan
[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + (2*I)*(Pi/2 - ArcTan[a*x]
)*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTan
[a*x]))]) + 2*(-PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))] + PolyLog[3, E^(I*(
Pi/2 - ArcTan[a*x]))])))/2 - 8*((I/64)*(Pi/2 - ArcTan[a*x])^4 + (I/4)*(Pi/2
 + (-1/2*Pi + ArcTan[a*x])/2)^4 - ((Pi/2 - ArcTan[a*x])^3*Log[1 + E^(I*(Pi/
2 - ArcTan[a*x]))])/8 - (Pi^3*(I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2) - Log[1
 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi + A
rcTan[a*x])/2)^3*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + ((
3*I)/8)*(Pi/2 - ArcTan[a*x])^2*PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] + (3
```

```
*Pi^2*((I/2)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + ArcT
an[a*x])/2)*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + (I/2)*P
olyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/4 + ((3*I)/2)*(P
i/2 + (-1/2*Pi + ArcTan[a*x])/2)^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi +
ArcTan[a*x])/2))] - (3*(Pi/2 - ArcTan[a*x])*PolyLog[3, -E^(I*(Pi/2 - ArcTan
[a*x]))])/4 - (3*Pi*((I/3)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3 - (Pi/2 + (
-1/2*Pi + ArcTan[a*x])/2)^2*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x]
)/2))] + I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2 +
(-1/2*Pi + ArcTan[a*x])/2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcT
an[a*x])/2))]/2))/2 - (3*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[3, -E^(
(2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^(I*
(Pi/2 - ArcTan[a*x]))] - ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi +
ArcTan[a*x])/2))])))/(8*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*ArcTan[
a*x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^4)
+ (Sqrt[c*(1 + a^2*x^2)]*(2*ArcTan[a*x] - ArcTan[a*x]^2 - ArcTan[a*x]^3))/(
16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^2) - (Sqrt[c
*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^2]*(Cos
[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^3) - (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*
x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^4) +
(Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^
2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]*(-
2*ArcTan[a*x] - ArcTan[a*x]^2 + ArcTan[a*x]^3))/(16*Sqrt[1 + a^2*x^2]*(Cos[
ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^2) + (Sqrt[c*(1 + a^2*x^2)]*(Sin[ArcTa
n[a*x]/2] - ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos[Ar
cTan[a*x]/2] + Sin[ArcTan[a*x]/2])) + (Sqrt[c*(1 + a^2*x^2)]*(-Sin[ArcTan[a
*x]/2] + ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos[ArcTa
n[a*x]/2] - Sin[ArcTan[a*x]/2])))/a^3
```

fricas [F] time = 0.84, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x^2\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.80, size = 460, normalized size = 0.62

$$\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(2\arctan\left(ax\right)^3a^3x^3-2\arctan\left(ax\right)^2x^2a^2+\arctan\left(ax\right)^3xa+2\arctan\left(ax\right)xa+\arctan\left(a\right.\right.}{8a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/8/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)^3*a^3*x^3-2*arctan(a*x)^2*
x^2*a^2+arctan(a*x)^3*x*a+2*arctan(a*x)*x*a+arctan(a*x)^2-2)-1/8*(c*(a*x-I)
*(I+a*x))^(1/2)*(arctan(a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*arct
an(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)^3*ln(1+I*(1+
```

```
I*a*x)/(a^2*x^2+1)^(1/2))+3*I*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2
+1)^(1/2))+4*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*arctan(a*x)*
polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-4*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^
2*x^2+1)^(1/2))+6*I*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*arctan(a*x)*
polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+4*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))-4*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*polylog(4,-I*(1+I*
a*x)/(a^2*x^2+1)^(1/2)))/a^3/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^2cx^2 + c}\,x^2 \arctan{(ax)}^3 \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2 \,\mathrm{atan}\left(a\,x\right)^3 \sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2} \sqrt{c \left(a^{2} x^{2} + 1\right)} \operatorname{atan}^{3}{\left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**3*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3, x)
```

3.414 $\int x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=373

$$-\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{c\sqrt{a^2x^2+1}\,\text{Li}_3\left(-ie^{i\tan^{-1}(a}\right.}{a^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/a^2/c-arctanh(a*x*c^(1/2)/(a^2*c*x^2+
c)^(1/2))*c^(1/2)/a^2+I*c*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2
*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-I*c*arctan(a*x)*polylog(2,-I*(1+
I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+I*c*arc
tan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^
2*c*x^2+c)^(1/2)+c*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1
/2)/a^2/(a^2*c*x^2+c)^(1/2)-c*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2
*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2-1
/2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.36, antiderivative size = 373, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.454, Rules used = {4930, 4880, 4890, 4888, 4181, 2531, 2282, 6589, 217, 206}

$$-\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{c\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/a^2 - (x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^
2)/(2*a) + (I*c*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/
(a^2*Sqrt[c + a^2*c*x^2]) + ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/(3*a^2*c)
 - (Sqrt[c]*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/a^2 - (I*c*Sqrt[1 +
 a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^2*Sqrt[c + a^2
*c*x^2]) + (I*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x]
)])/(a^2*Sqrt[c + a^2*c*x^2]) + (c*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*A
rcTan[a*x])])/(a^2*Sqrt[c + a^2*c*x^2]) - (c*Sqrt[1 + a^2*x^2]*PolyLog[3, I
*E^(I*ArcTan[a*x])])/(a^2*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx = \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3a^2c} - \frac{\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx}{a}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a} + \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3a^2c}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a} + \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3a^2c}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a} + \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3a^2c}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a} + \frac{ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan}\right.}{a^2\sqrt{c+a^2c}}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a} + \frac{ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan}\right.}{a^2\sqrt{c+a^2c}}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a} + \frac{ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan}\right.}{a^2\sqrt{c+a^2c}}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^2} - \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a} + \frac{ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan}\right.}{a^2\sqrt{c+a^2c}}$$

Mathematica [A] time = 0.59, size = 206, normalized size = 0.55

$$\frac{\sqrt{a^2cx^2+c}\left(\left(a^2x^2+1\right)\tan^{-1}(ax)\left(4\tan^{-1}(ax)^2-3\tan^{-1}(ax)\sin\left(2\tan^{-1}(ax)\right)+6\cos\left(2\tan^{-1}(ax)\right)+6\right)+\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*((12*(I*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 - ArcT
anh[(a*x)/Sqrt[1 + a^2*x^2]] - I*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*
x])] + I*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + PolyLog[3, (-I)*E^(I
*ArcTan[a*x])] - PolyLog[3, I*E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] + (1 +
 a^2*x^2)*ArcTan[a*x]*(6 + 4*ArcTan[a*x]^2 + 6*Cos[2*ArcTan[a*x]] - 3*ArcTa
n[a*x]*Sin[2*ArcTan[a*x]])))/(12*a^2)
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x\arctan(ax)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.33, size = 370, normalized size = 0.99

$$\frac{\sqrt{c(ax-i)(ax+i)}\ \arctan(ax)\left(2\arctan(ax)^2x^2a^2-3\arctan(ax)xa+2\arctan(ax)^2+6\right)}{6a^2}-\frac{\sqrt{c(ax-i)(ax+i)}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/6/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(2*arctan(a*x)^2*x^2*a^2-3*ar
ctan(a*x)*x*a+2*arctan(a*x)^2+6)-1/6*(c*(a*x-I)*(I+a*x))^(1/2)*(-I*arctan(a
*x)^3+3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*p
olylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)
^(1/2)))/a^2/(a^2*x^2+1)^(1/2)+1/6*(c*(a*x-I)*(I+a*x))^(1/2)*(-I*arctan(a*x
)^3+3*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*pol
ylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)
^(1/2)))/a^2/(a^2*x^2+1)^(1/2)+2*I/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*arctan((1+
I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\sqrt{a^2cx^2+c}\,x\arctan(ax)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*x*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}(a\,x)^3\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^3*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x*atan(a*x)^3*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**3*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3, x)
```

3.415 $\int \sqrt{c + a^2cx^2}\ \tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=626

$$\frac{3ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}-\frac{3ic\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}+\frac{3ic\sqrt{a^2x^2+1}\ \tan^{-1}(ax)^2\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{2a\sqrt{a^2cx^2+c}}-\frac{3ic\sqrt{a^2}}{}$$

```
[Out] -I*c*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a/
(a^2*c*x^2+c)^(1/2)-6*I*c*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2
))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+3/2*I*c*arctan(a*x)^2*polylog(2,
-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3/2
*I*c*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/
2)/a/(a^2*c*x^2+c)^(1/2)+3*I*c*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2)
)*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3*I*c*polylog(2,I*(1+I*a*x)^(1/2)
/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3*c*arctan(a*x)*p
olylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^
(1/2)+3*c*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^
(1/2)/a/(a^2*c*x^2+c)^(1/2)-3*I*c*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+3*I*c*polylog(4,I*(1+I*a*x)/(a^2*x
^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3/2*arctan(a*x)^2*(a^2
*c*x^2+c)^(1/2)/a+1/2*x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.36, antiderivative size = 626, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4880, 4890, 4888, 4181, 2531, 6609, 2282, 6589, 4886}

$$\frac{3ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}-\frac{3ic\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a\sqrt{a^2cx^2+c}}+\frac{3ic\sqrt{a^2x^2+1}\ \tan^{-1}(ax)^2\mathrm{PolyLog}}{2a\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] (-3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*a) + (x*Sqrt[c + a^2*c*x^2]*ArcTa
n[a*x]^3)/2 - (I*c*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^
3)/(a*Sqrt[c + a^2*c*x^2]) - ((6*I)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[
Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) + (((3*I)/2)*c*Sq
rt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c
 + a^2*c*x^2]) - (((3*I)/2)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, I*
E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + ((3*I)*c*Sqrt[1 + a^2*x^2]*Po
lyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) -
 ((3*I)*c*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]]
)/(a*Sqrt[c + a^2*c*x^2]) - (3*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (
-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + (3*c*Sqrt[1 + a^2*x^2]*Ar
cTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - ((3*I)
*c*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*
x^2]) + ((3*I)*c*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/(a*Sqrt
[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
```

```
d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \sqrt{c+a^2cx^2}\tan^{-1}(ax)^3\,dx = -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3+\frac{1}{2}c\int\frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3+\frac{\left(c\sqrt{1+a^2x^2}\right)\int\frac{\tan^{-1}}{\sqrt{1+}}}{2\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3-\frac{6ic\sqrt{1+a^2x^2}\tan^{-1}(}{a\sqrt{c+a}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e\right.}{a\sqrt{c+}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e\right.}{a\sqrt{c+}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e\right.}{a\sqrt{c+}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e\right.}{a\sqrt{c+}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3-\frac{ic\sqrt{1+a^2x^2}\tan^{-1}\left(e\right.}{a\sqrt{c+}}$$

Mathematica [A] time = 0.84, size = 258, normalized size = 0.41

$$-\frac{i\sqrt{c\left(a^2x^2+1\right)}\left(iax\sqrt{a^2x^2+1}\tan^{-1}(ax)^3-3i\sqrt{a^2x^2+1}\tan^{-1}(ax)^2-6i\tan^{-1}(ax)\mathrm{Li}_3\left(-ie^{i\tan^{-1}(ax)}\right)+6i\tan\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
```

```
[Out] ((-1/2*I)*Sqrt[c*(1 + a^2*x^2)]*(12*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x] -
 (3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + I*a*x*Sqrt[1 + a^2*x^2]*ArcTan[a*x
]^3 + 2*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3 - 3*(2 + ArcTan[a*x]^2)*Pol
yLog[2, (-I)*E^(I*ArcTan[a*x])] + 3*(2 + ArcTan[a*x]^2)*PolyLog[2, I*E^(I*A
rcTan[a*x])] - (6*I)*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + (6*I)
*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])] + 6*PolyLog[4, (-I)*E^(I*ArcTa
n[a*x])] - 6*PolyLog[4, I*E^(I*ArcTan[a*x])]))/(a*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.62, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\sqrt{a^2cx^2+c}\arctan(ax)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.89, size = 422, normalized size = 0.67

$$\frac{\sqrt{c(ax-i)(ax+i)}\ \arctan(ax)^2(\arctan(ax)xa-3)}{2a}+\frac{\sqrt{c(ax-i)(ax+i)}\ \left(\arctan(ax)^3\ln\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-3i\,\mathrm{arc}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/2/a*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^2*(arctan(a*x)*x*a-3)+1/2*(c*(a
*x-I)*(I+a*x))^(1/2)*(arctan(a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I
*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)^3*ln(1+
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*I*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^
2*x^2+1)^(1/2))+6*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*arctan(
a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*polylog(4,I*(1+I*a*x)/(a^
2*x^2+1)^(1/2))-6*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*arctan(
a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*polylog(4,-I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))+6*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*dilog(1-I*
(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^2cx^2+c}\ \arctan(ax)^3\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}(a\,x)^3\,\sqrt{c\,a^2\,x^2+c}\ dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^3*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{c\left(a^2x^2+1\right)}\ \mathrm{atan}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3, x)
```

3.416 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{x}\,dx$

Optimal. Leaf size=600

$$\frac{3ic\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ic\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{6ic\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{L}}{\sqrt{a^2cx^2+}}$$

```
[Out] 6*I*c*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)-2*c*arctan(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(
a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*c*arctan(a*x)^2*polylog(2,-(1+I*a*
x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*c*arctan(a*
x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c
)^(1/2)+6*I*c*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2
+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*c*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*
x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*c*arctan(a*x)*polylog
(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*c*
polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(
1/2)-6*c*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*
x^2+c)^(1/2)+6*c*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^
2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*c*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*I*c*polylog(4,(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^3*(a^2*c*x^2+c)
^(1/2)
```

Rubi [A] time = 0.73, antiderivative size = 600, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4958, 4956, 4183, 2531, 6609, 2282, 6589, 4930, 4890, 4888, 4181}

$$\frac{3ic\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ic\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{6ic\sqrt{a^2x^}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x,x]
```

```
[Out] ((6*I)*c*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c
+ a^2*c*x^2] + Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3 - (2*c*Sqrt[1 + a^2*x^2]*A
rcTan[a*x]^3*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((3*I)*c*Sqr
t[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c
*x^2] - ((6*I)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[
a*x])])/Sqrt[c + a^2*c*x^2] + ((6*I)*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLo
g[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*c*Sqrt[1 + a^2*x^2]
*ArcTan[a*x]^2*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (6*c*Sq
rt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*
x^2] + (6*c*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c +
a^2*c*x^2] - (6*c*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/Sqrt[c
 + a^2*c*x^2] + (6*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, E^(I*ArcTan[a
*x])])/Sqrt[c + a^2*c*x^2] - ((6*I)*c*Sqrt[1 + a^2*x^2]*PolyLog[4, -E^(I*Ar
cTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((6*I)*c*Sqrt[1 + a^2*x^2]*PolyLog[4, E^
(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
```

```
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x}\,dx = c\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{x\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$$

$$= \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - (3ac)\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx + \frac{\left(c\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)^3}{x\sqrt{1+a^2x^2}}}{\sqrt{c+a^2cx^2}}$$

$$= \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 + \frac{\left(c\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^3\csc(x)\,dx, x, \tan^{-1}(ax)\right)}{\sqrt{c+a^2cx^2}} -$$

$$= \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{2c\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} - \frac{\left(3c\sqrt{1\right.}}{}$$

$$= \frac{6ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} + \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{2c\sqrt{1}}{}$$

$$= \frac{6ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} + \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{2c\sqrt{1}}{}$$

$$= \frac{6ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} + \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{2c\sqrt{1}}{}$$

$$= \frac{6ic\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}} + \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{2c\sqrt{1}}{}$$

Mathematica [A] time = 0.63, size = 366, normalized size = 0.61

$$\frac{\sqrt{a^2cx^2+c}\left(8\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^3 + 24i\tan^{-1}(ax)^2\text{Li}_2\left(e^{-i\tan^{-1}(ax)}\right) + 24i\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - 48i\,\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x,x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*((-I)*Pi^4 + 8*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3 + (2*I)
*ArcTan[a*x]^4 + 8*ArcTan[a*x]^3*Log[1 - E^((-I)*ArcTan[a*x])] - 24*ArcTan[
a*x]^2*Log[1 - I*E^(I*ArcTan[a*x])] + 24*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTa
n[a*x])] - 8*ArcTan[a*x]^3*Log[1 + E^(I*ArcTan[a*x])] + (24*I)*ArcTan[a*x]^
2*PolyLog[2, E^((-I)*ArcTan[a*x])] + (24*I)*ArcTan[a*x]^2*PolyLog[2, -E^(I*
ArcTan[a*x])] - (48*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (48
*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + 48*ArcTan[a*x]*PolyLog[3,
 E^((-I)*ArcTan[a*x])] - 48*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] + 48
*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 48*PolyLog[3, I*E^(I*ArcTan[a*x])] -
(48*I)*PolyLog[4, E^((-I)*ArcTan[a*x])] - (48*I)*PolyLog[4, -E^(I*ArcTan[a*
x])]))/(8*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.29, size = 453, normalized size = 0.76

$$\sqrt{c(ax-i)(ax+i)}\,\arctan(ax)^3+\frac{\sqrt{c(ax-i)(ax+i)}\,\left(3i\arctan(ax)^2\operatorname{polylog}\left(2,-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-\arctan(ax)^3\ln\left(1\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x,x)
```

```
[Out] (c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^3+(c*(a*x-I)*(I+a*x))^(1/2)*(3*I*arct
an(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-arctan(a*x)^3*ln(1+(1+I*a
*x)/(a^2*x^2+1)^(1/2))+arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*
arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*ln(1+I
*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x
^2+1)^(1/2))-3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan
(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*polylog(4,(1+I*a*x)/(a^2
*x^2+1)^(1/2))-6*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*po
lylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*arctan(a*x)*polylog(3,(1+I*a*x)/(a^
2*x^2+1)^(1/2))+6*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(3,I*(
1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}\left(a\,x\right)^3\,\sqrt{c\,a^2\,x^2+c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\operatorname{atan}^3\left(ax\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3*(a**2*c*x**2+c)**(1/2)/x,x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3/x, x)
```

3.417 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{x^2}\,dx$

Optimal. Leaf size=622

$$\frac{3iac\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3iac\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{6iac\sqrt{a^2x^2+1}\tan^{-1}(ax}{\sqrt{a^2cx^2+}}$$

```
[Out] -2*I*a*c*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2
)/(a^2*c*x^2+c)^(1/2)-6*a*c*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*I*a*c*arctan(a*x)*polylog(2,-(1
+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*a*c*ar
ctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)-3*I*a*c*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*a*c*arctan(a*x)*polylog(2,(1
+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a*c*poly
log(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6
*a*c*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2
)/(a^2*c*x^2+c)^(1/2)+6*a*c*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*a*c*polylog(3,(1+I*a*x)/(a^2*
x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*a*c*polylog(4,-I*(1
+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*I*a*c*po
lylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2
)-arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x
```

Rubi [A] time = 0.77, antiderivative size = 622, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4944, 4958, 4956, 4183, 2531, 2282, 6589, 4890, 4888, 4181, 6609}

$$\frac{3iac\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3iac\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{6iac\sqrt{a^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x) - ((2*I)*a*c*Sqrt[1 + a^2*x^2]*Arc
Tan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2] - (6*a*c*Sqrt[1 +
 a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (
(6*I)*a*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqr
t[c + a^2*c*x^2] + ((3*I)*a*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-
I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a*c*Sqrt[1 + a^2*x^2]*A
rcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((6*I)*
a*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a
^2*c*x^2] - (6*a*c*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c
 + a^2*c*x^2] - (6*a*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*A
rcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (6*a*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Po
lyLog[3, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (6*a*c*Sqrt[1 + a^2*x^
2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((6*I)*a*c*Sqrt[1 +
 a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((6*I)*
a*c*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
```

```
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^2}\,dx = c\int \frac{\tan^{-1}(ax)^3}{x^2\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + (3ac)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx + \frac{\left(a^2c\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax}{\sqrt{1+a^2x}}}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{\left(ac\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^3\sec(x)\,dx, x, \tan^{-1}(ax)\right)}{\sqrt{c+a^2cx^2}} +$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} - \frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} + \frac{\left(3ac\sqrt{\right.}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} - \frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} - \frac{6ac\sqrt{1}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} - \frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} - \frac{6ac\sqrt{1}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} - \frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} - \frac{6ac\sqrt{1}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} - \frac{2iac\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} - \frac{6ac\sqrt{1}}{}$$

Mathematica [A] time = 3.51, size = 768, normalized size = 1.23

$$\frac{a\sqrt{a^2cx^2+c}\,\csc\left(\frac{1}{2}\tan^{-1}(ax)\right)\sec\left(\frac{1}{2}\tan^{-1}(ax)\right)\left(-64\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^3+192iax\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{-i\tan^{-1}(ax}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] (a*Sqrt[c + a^2*c*x^2]*Csc[ArcTan[a*x]/2]*((-7*I)*a*Pi^4*x - (8*I)*a*Pi^3*x
*ArcTan[a*x] + (24*I)*a*Pi^2*x*ArcTan[a*x]^2 - (32*I)*a*Pi*x*ArcTan[a*x]^3
- 64*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3 + (16*I)*a*x*ArcTan[a*x]^4 + 48*a*Pi^2
*x*ArcTan[a*x]*Log[1 - I/E^(I*ArcTan[a*x])] - 96*a*Pi*x*ArcTan[a*x]^2*Log[1
 - I/E^(I*ArcTan[a*x])] - 8*a*Pi^3*x*Log[1 + I/E^(I*ArcTan[a*x])] + 64*a*x*
ArcTan[a*x]^3*Log[1 + I/E^(I*ArcTan[a*x])] + 192*a*x*ArcTan[a*x]^2*Log[1 -
E^(I*ArcTan[a*x])] + 8*a*Pi^3*x*Log[1 + I*E^(I*ArcTan[a*x])] - 48*a*Pi^2*x*
ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] + 96*a*Pi*x*ArcTan[a*x]^2*Log[1 +
I*E^(I*ArcTan[a*x])] - 64*a*x*ArcTan[a*x]^3*Log[1 + I*E^(I*ArcTan[a*x])] -
192*a*x*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + 8*a*Pi^3*x*Log[Tan[(Pi +
 2*ArcTan[a*x])/4]] + (192*I)*a*x*ArcTan[a*x]^2*PolyLog[2, (-I)/E^(I*ArcTan
[a*x])] + (48*I)*a*Pi*x*(Pi - 4*ArcTan[a*x])*PolyLog[2, I/E^(I*ArcTan[a*x])
] + (384*I)*a*x*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] + (48*I)*a*Pi^2*
x*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (192*I)*a*Pi*x*ArcTan[a*x]*PolyLog[2
, (-I)*E^(I*ArcTan[a*x])] + (192*I)*a*x*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*
ArcTan[a*x])] - (384*I)*a*x*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] + 384
*a*x*ArcTan[a*x]*PolyLog[3, (-I)/E^(I*ArcTan[a*x])] - 192*a*Pi*x*PolyLog[3,
 I/E^(I*ArcTan[a*x])] - 384*a*x*PolyLog[3, -E^(I*ArcTan[a*x])] + 192*a*Pi*x
*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 384*a*x*ArcTan[a*x]*PolyLog[3, (-I)*E
^(I*ArcTan[a*x])] + 384*a*x*PolyLog[3, E^(I*ArcTan[a*x])] - (384*I)*a*x*Pol
yLog[4, (-I)/E^(I*ArcTan[a*x])] - (384*I)*a*x*PolyLog[4, (-I)*E^(I*ArcTan[a
*x])])*Sec[ArcTan[a*x]/2])/(128*(1 + a^2*x^2))
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\ \arctan(ax)^3}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.26, size = 466, normalized size = 0.75

$$-\frac{\sqrt{c(ax-i)(ax+i)}\ \arctan(ax)^3}{x}-\frac{ia\sqrt{c(ax-i)(ax+i)}\ \left(i\arctan(ax)^3\ln\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-i\arctan(ax)^3\ln\left(\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^2,x)
```

```
[Out] -(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^3/x-I*a*(c*(a*x-I)*(I+a*x))^(1/2)*(I
*arctan(a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)^3*ln(1+I*(
```

```
1+I*a*x)/(a^2*x^2+1)^(1/2))+3*I*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1
/2))-3*I*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*po
lylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan(a*x)*polylog(3,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/
2))-6*I*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*arctan(a*x)
*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*polylog(3,(1+I*a*x)/(a^2*x^2+1)
^(1/2))-6*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*polylog(3
,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6
*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^2,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,\sqrt{c\,a^2\,x^2+c}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x^2,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^3(ax)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3*(a**2*c*x**2+c)**(1/2)/x**2,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3/x**2, x)
```

3.418 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{x^3}\,dx$

Optimal. Leaf size=602

$$\frac{3ia^2c\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ia^2c\sqrt{a^2x^2+1}\,\mathrm{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{3ia^2c\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{2\sqrt{a^2cx^2+c}}-\frac{3i}{}$$

```
[Out] -a^2*c*arctan(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)
/(a^2*c*x^2+c)^(1/2)-6*a^2*c*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^
(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3/2*I*a^2*c*arctan(a*x)^2*poly
log(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3
/2*I*a^2*c*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)
^(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*a^2*c*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(
1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^2*c*polylog(2,(1+I*a*x)^(
1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*a^2*c*arctan(
a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c
)^(1/2)+3*a^2*c*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2
+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^2*c*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1
/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*a^2*c*polylog(4,(1+I*a*x)/(a
^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3/2*a*arctan(a*x)^2*
(a^2*c*x^2+c)^(1/2)/x-1/2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 1.24, antiderivative size = 602, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4950, 4962, 4944, 4958, 4954, 4956, 4183, 2531, 6609, 2282, 6589}

$$\frac{3ia^2c\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ia^2c\sqrt{a^2x^2+1}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}+\frac{3ia^2c\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\mathrm{Poly}}{2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (-3*a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*x) - (Sqrt[c + a^2*c*x^2]*ArcTa
n[a*x]^3)/(2*x^2) - (a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*Arc
Tan[a*x])])/Sqrt[c + a^2*c*x^2] - (6*a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Ar
cTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] + (((3*I)/2)*a^
2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c
+ a^2*c*x^2] - (((3*I)/2)*a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2,
E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((3*I)*a^2*c*Sqrt[1 + a^2*x^2]*Po
lyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*
a^2*c*Sqrt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c
 + a^2*c*x^2] - (3*a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, -E^(I*Arc
Tan[a*x])])/Sqrt[c + a^2*c*x^2] + (3*a^2*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Po
lyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^2*c*Sqrt[1 + a^
2*x^2]*PolyLog[4, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((3*I)*a^2*c*S
qrt[1 + a^2*x^2]*PolyLog[4, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
```

```
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^3}\,dx = c\int \frac{\tan^{-1}(ax)^3}{x^3\sqrt{c+a^2cx^2}}\,dx + \left(a^2c\right)\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} + \frac{1}{2}(3ac)\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\,dx - \frac{1}{2}\left(a^2c\right)\int \frac{\tan^{-1}(a}{x\sqrt{c+a^2}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} + \left(3a^2c\right)\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} - \frac{2a^2c\sqrt{1+a^2x^2}\,\tan^{-1}(}{\sqrt{c+}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\,\tan^{-1}(a}{\sqrt{c+}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\,\tan^{-1}(a}{\sqrt{c+}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\,\tan^{-1}(a}{\sqrt{c+}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\,\tan^{-1}(a}{\sqrt{c+}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2} - \frac{a^2c\sqrt{1+a^2x^2}\,\tan^{-1}(a}{\sqrt{c+}$$

Mathematica [A] time = 5.94, size = 345, normalized size = 0.57

$$a^2\sqrt{c\left(a^2x^2+1\right)}\left(24i\tan^{-1}(ax)^2\mathrm{Li}_2\left(e^{-i\tan^{-1}(ax)}\right)+48\tan^{-1}(ax)\mathrm{Li}_3\left(e^{-i\tan^{-1}(ax)}\right)-48\tan^{-1}(ax)\mathrm{Li}_3\left(-e^{i\tan^{-1}(ax}\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (a^2*Sqrt[c*(1 + a^2*x^2)]*((-I)*Pi^4 + (2*I)*ArcTan[a*x]^4 - 12*ArcTan[a*x
]^2*Cot[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Csc[ArcTan[a*x]/2]^2 + 8*ArcTan[a*
x]^3*Log[1 - E^((-I)*ArcTan[a*x])] + 48*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x
])] - 48*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] - 8*ArcTan[a*x]^3*Log[1 + E
^(I*ArcTan[a*x])] + (24*I)*ArcTan[a*x]^2*PolyLog[2, E^((-I)*ArcTan[a*x])] +
 (24*I)*(2 + ArcTan[a*x]^2)*PolyLog[2, -E^(I*ArcTan[a*x])] - (48*I)*PolyLog
[2, E^(I*ArcTan[a*x])] + 48*ArcTan[a*x]*PolyLog[3, E^((-I)*ArcTan[a*x])] -
48*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] - (48*I)*PolyLog[4, E^((-I)*A
rcTan[a*x])] - (48*I)*PolyLog[4, -E^(I*ArcTan[a*x])] + 2*ArcTan[a*x]^3*Sec[
ArcTan[a*x]/2]^2 - 12*ArcTan[a*x]^2*Tan[ArcTan[a*x]/2]))/(16*Sqrt[1 + a^2*x
^2])
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\ \arctan(ax)^3}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.40, size = 404, normalized size = 0.67

$$-\frac{\sqrt{c(ax-i)(ax+i)}\ \arctan(ax)^2(3ax+\arctan(ax))}{2x^2}+\frac{ia^2\sqrt{c(ax-i)(ax+i)}\ \left(i\arctan(ax)^3\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^3,x)
```

```
[Out] -1/2*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^2*(3*a*x+arctan(a*x))/x^2+1/2*I*
a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(I*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(
1/2))-I*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan(a*x)*ln(
1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^
2+1)^(1/2))+6*I*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arc
tan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)^2*polylog(2,(1+I*a
*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2
))+6*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(4,-(1+I*a*x)/(a^2*x^
2+1)^(1/2))-6*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(4,(1+I*a*x)/
(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\sqrt{a^2cx^2+c}\ \arctan(ax)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^3,x, algorithm="maxima")
```

```
[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3\,\sqrt{c\,a^2\,x^2+c}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x^3,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\,\operatorname{atan}^3(ax)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3*(a**2*c*x**2+c)**(1/2)/x**3,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3/x**3, x)
```

3.419 $\int \frac{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3}{x^4} dx$

Optimal. Leaf size=361

$$-\frac{a^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{x}-\frac{a\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}{2x^2}-\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3}+\frac{ia^3c\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(-e^{i\right.}}{\sqrt{a^2cx^2+c}}$$

```
[Out] -1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/c/x^3-a^3*arctanh((a^2*c*x^2+c)^(1/2
)/c^(1/2))*c^(1/2)-a^3*c*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))
*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+I*a^3*c*arctan(a*x)*polylog(2,-(1+I*
a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-I*a^3*c*arcta
n(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+
c)^(1/2)-a^3*c*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a
^2*c*x^2+c)^(1/2)+a^3*c*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^
(1/2)/(a^2*c*x^2+c)^(1/2)-a^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x-1/2*a*arcta
n(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 1.02, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4944, 4950, 4962, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589}

$$\frac{ia^3c\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{ia^3c\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{a^3c\sqrt{a^2x^2+\right.}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] -((a^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x) - (a*Sqrt[c + a^2*c*x^2]*ArcTan[
a*x]^2)/(2*x^2) - ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/(3*c*x^3) - (a^3*c*
Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*
x^2] - a^3*Sqrt[c]*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]] + (I*a^3*c*Sqrt[1 +
 a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] -
 (I*a^3*c*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt
[c + a^2*c*x^2] - (a^3*c*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/
Sqrt[c + a^2*c*x^2] + (a^3*c*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])
])/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
```

```
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{x^4}\,dx = -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3} + a\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{x^3}\,dx$$

$$= -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3} + (ac)\int \frac{\tan^{-1}(ax)^2}{x^3\sqrt{c+a^2cx^2}}\,dx + \left(a^3c\right)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,d$$

$$= -\frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3} + \left(a^2c\right)\int \frac{\tan^{-1}(ax)}{x^2\sqrt{c+a^2cx^2}}\,d$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{x} - \frac{a\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2x^2} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3cx^3}$$

Mathematica [A] time = 3.92, size = 341, normalized size = 0.94

$$\frac{a^3c\sqrt{a^2x^2+1}\left(-\frac{ax\tan^{-1}(ax)^3\csc^4\left(\frac{1}{2}\tan^{-1}(ax)\right)}{2\sqrt{a^2x^2+1}} - \frac{8\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^3\sin^4\left(\frac{1}{2}\tan^{-1}(ax)\right)}{a^3x^3} + 24i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - 2\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] (a^3*c*Sqrt[1 + a^2*x^2]*(-12*ArcTan[a*x]*Cot[ArcTan[a*x]/2] - 2*ArcTan[a*x
]^3*Cot[ArcTan[a*x]/2] - 3*ArcTan[a*x]^2*Csc[ArcTan[a*x]/2]^2 - (a*x*ArcTan
```

```
[a*x]^3*Csc[ArcTan[a*x]/2]^4)/(2*Sqrt[1 + a^2*x^2]) + 12*ArcTan[a*x]^2*Log[
1 - E^(I*ArcTan[a*x])] - 12*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + 24*L
og[Tan[ArcTan[a*x]/2]] + (24*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])]
- (24*I)*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] - 24*PolyLog[3, -E^(I*Ar
cTan[a*x])] + 24*PolyLog[3, E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]^2*Sec[ArcTan
[a*x]/2]^2 - (8*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^3*Sin[ArcTan[a*x]/2]^4)/(a^
3*x^3) - 12*ArcTan[a*x]*Tan[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Tan[ArcTan[a*x
]/2]))/(24*Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.64, size = 462, normalized size = 1.28

$$-\frac{\sqrt{c(ax-i)(ax+i)}\,\arctan(ax)\left(2\arctan(ax)^2x^2a^2+6a^2x^2+3\arctan(ax)xa+2\arctan(ax)^2\right)}{6x^3}+\frac{a^3\sqrt{c(ax}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^4,x)
```

```
[Out] -1/6*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(2*arctan(a*x)^2*x^2*a^2+6*a^2*x
^2+3*arctan(a*x)*x*a+2*arctan(a*x)^2)/x^3+1/2*a^3*(c*(a*x-I)*(I+a*x))^(1/2)
*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)-I*a^3*(c
*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))/
(a^2*x^2+1)^(1/2)+a^3*(c*(a*x-I)*(I+a*x))^(1/2)*polylog(3,(1+I*a*x)/(a^2*x^
2+1)^(1/2))/(a^2*x^2+1)^(1/2)-1/2*a^3*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)
^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)+I*a^3*(c*(a*x-I)*(I+
a*x))^(1/2)*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)
^(1/2)-a^3*(c*(a*x-I)*(I+a*x))^(1/2)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)/(a^2*x^2+1)^(1/2)-2*a^3*(c*(a*x-I)*(I+a*x))^(1/2)*arctanh((1+I*a*x)/(a^2*
x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^4,x, algorithm="maxima")
```

[Out] integrate(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/x^4, x)

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,\sqrt{c\,a^2\,x^2+c}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x^4,x)

[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(1/2))/x^4, x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^{2}x^{2}+1\right)}\,\mathrm{atan}^{3}\left(ax\right)}{x^{4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(atan(a*x)**3*(a**2*c*x**2+c)**(1/2)/x**4,x)

[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3/x**4, x)

3.420 $\int x^3 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=652

$$\frac{cx^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3}{35a^2}+\frac{cx^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}{60a^2}+\frac{1}{7}a^2cx^6\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3-\frac{1}{14}acx^5\sqrt{a^2cx^2+c}\tan$$

```
[Out] 23/120*c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^4-51/280*I*c^2*ar
ctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a
^2*c*x^2+c)^(1/2)+51/280*I*c^2*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-51/280*I*c^2*arctan((1+
I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)
^(1/2)-51/280*c^2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/
2)/a^4/(a^2*c*x^2+c)^(1/2)+51/280*c^2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+1/420*c*x*(a^2*c*x^2+c)^(1/2)
/a^3-1/140*c*x^3*(a^2*c*x^2+c)^(1/2)/a-163/840*c*arctan(a*x)*(a^2*c*x^2+c)^
(1/2)/a^4+1/60*c*x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2+1/35*c*x^4*arctan(
a*x)*(a^2*c*x^2+c)^(1/2)+9/112*c*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^3-23
/280*c*x^3*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a-1/14*a*c*x^5*arctan(a*x)^2*(
a^2*c*x^2+c)^(1/2)-2/35*c*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^4+1/35*c*x^2*
arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^2+8/35*c*x^4*arctan(a*x)^3*(a^2*c*x^2+c
)^(1/2)+1/7*a^2*c*x^6*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 7.37, antiderivative size = 652, normalized size of antiderivative = 1.00, number of steps used = 200, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589, 321}

$$\frac{51ic^2\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{280a^4\sqrt{a^2cx^2+c}}-\frac{51ic^2\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{280a^4\sqrt{a^2cx^2+c}}-\frac{51c^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*x*Sqrt[c + a^2*c*x^2])/(420*a^3) - (c*x^3*Sqrt[c + a^2*c*x^2])/(140*a) -
 (163*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(840*a^4) + (c*x^2*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x])/(60*a^2) + (c*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/35 + (
9*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(112*a^3) - (23*c*x^3*Sqrt[c + a^2
*c*x^2]*ArcTan[a*x]^2)/(280*a) - (a*c*x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2
)/14 - (((51*I)/280)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan
[a*x]^2)/(a^4*Sqrt[c + a^2*c*x^2]) - (2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3
)/(35*a^4) + (c*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(35*a^2) + (8*c*x^4*
Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/35 + (a^2*c*x^6*Sqrt[c + a^2*c*x^2]*ArcT
an[a*x]^3)/7 + (23*c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(120
*a^4) + (((51*I)/280)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(
I*ArcTan[a*x])])/(a^4*Sqrt[c + a^2*c*x^2]) - (((51*I)/280)*c^2*Sqrt[1 + a^2
*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^4*Sqrt[c + a^2*c*x^2]
) - (51*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(280*a^4*
Sqrt[c + a^2*c*x^2]) + (51*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a
*x])])/(280*a^4*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3\,dx = c\int x^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx+\left(a^2c\right)\int x^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx$$

$$= c^2\int\frac{x^3\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx+2\left(\left(a^2c^2\right)\int\frac{x^5\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx\right)+\left(a^4c^2\right)\int\frac{x^7\tan^{-1}(}{\sqrt{c+a^2}}$$

$$= \frac{cx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3a^2}+\frac{1}{7}a^2cx^6\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3-\frac{\left(2c^2\right)\int\frac{x\tan^{-1}(}{\sqrt{c+a^2}}}{3a^2}$$

$$= -\frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3}-\frac{1}{14}acx^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2-\frac{2c\sqrt{c+a^2cx^2}}{3a^4}$$

$$= \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^4}+\frac{1}{35}cx^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)-\frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}}{2a^3}$$

$$= -\frac{cx^3\sqrt{c+a^2cx^2}}{140a}+\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{a^4}-\frac{11cx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{60a^2}+$$

$$= \frac{43cx\sqrt{c+a^2cx^2}}{420a^3}-\frac{cx^3\sqrt{c+a^2cx^2}}{140a}+\frac{2273c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{840a^4}-\frac{11cx^2\sqrt{}}{}$$

$$= \frac{43cx\sqrt{c+a^2cx^2}}{420a^3}-\frac{cx^3\sqrt{c+a^2cx^2}}{140a}+\frac{2273c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{840a^4}-\frac{11cx^2\sqrt{}}{}$$

$$= \frac{43cx\sqrt{c+a^2cx^2}}{420a^3}-\frac{cx^3\sqrt{c+a^2cx^2}}{140a}+\frac{2273c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{840a^4}-\frac{11cx^2\sqrt{}}{}$$

$$= \frac{43cx\sqrt{c+a^2cx^2}}{420a^3}-\frac{cx^3\sqrt{c+a^2cx^2}}{140a}+\frac{2273c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{840a^4}-\frac{11cx^2\sqrt{}}{}$$

$$= \frac{43cx\sqrt{c+a^2cx^2}}{420a^3}-\frac{cx^3\sqrt{c+a^2cx^2}}{140a}+\frac{2273c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{840a^4}-\frac{11cx^2\sqrt{}}{}$$

$$= \frac{43cx\sqrt{c+a^2cx^2}}{420a^3}-\frac{cx^3\sqrt{c+a^2cx^2}}{140a}+\frac{2273c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{840a^4}-\frac{11cx^2\sqrt{}}{}$$

Mathematica [A] time = 3.69, size = 538, normalized size = 0.83

$$\frac{c\sqrt{a^2cx^2+c}\left(64\left(-259\tanh^{-1}\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)-309i\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+309i\tan^{-1}(ax)\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+3\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(64*((309*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2
 - 259*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - (309*I)*ArcTan[a*x]*PolyLog[2, (-
I)*E^(I*ArcTan[a*x])] + (309*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])]
 + 309*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 309*PolyLog[3, I*E^(I*ArcTan[a*
```

```
x])]) + 2688*((-11*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 10*ArcTanh[
(a*x)/Sqrt[1 + a^2*x^2]] + (11*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a
*x])] - (11*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - 11*PolyLog[3,
(-I)*E^(I*ArcTan[a*x])] + 11*PolyLog[3, I*E^(I*ArcTan[a*x])]) - 56*(1 + a^2
*x^2)^(5/2)*((48*a*x)/(1 + a^2*x^2)^2 + 32*ArcTan[a*x]^3*(-1 + 5*Cos[2*ArcT
an[a*x]]) + 6*ArcTan[a*x]*(25 + 36*Cos[2*ArcTan[a*x]] + 11*Cos[4*ArcTan[a*x
]]) + ArcTan[a*x]^2*(6*Sin[2*ArcTan[a*x]] - 33*Sin[4*ArcTan[a*x]])) + (1 +
a^2*x^2)^(7/2)*(64*ArcTan[a*x]^3*(57 - 28*Cos[2*ArcTan[a*x]] + 35*Cos[4*Arc
Tan[a*x]]) + (8*ArcTan[a*x]*(647 + 764*Cos[2*ArcTan[a*x]] + 309*Cos[4*ArcTa
n[a*x]]))/(1 + a^2*x^2) + 4*(101*Sin[2*ArcTan[a*x]] + 88*Sin[4*ArcTan[a*x]]
 + 25*Sin[6*ArcTan[a*x]]) - 3*ArcTan[a*x]^2*(211*Sin[2*ArcTan[a*x]] - 60*Si
n[4*ArcTan[a*x]] + 103*Sin[6*ArcTan[a*x]]))))/(53760*a^4*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^5 + cx^3\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^5 + c*x^3)*sqrt(a^2*c*x^2 + c)*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.84, size = 469, normalized size = 0.72

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(240\arctan\left(ax\right)^3x^6a^6 - 120\arctan\left(ax\right)^2x^5a^5 + 384\arctan\left(ax\right)^3x^4a^4 + 48\arctan\left(ax\right)x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x)
```

```
[Out] 1/1680*c/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(240*arctan(a*x)^3*x^6*a^6-120*arcta
n(a*x)^2*x^5*a^5+384*arctan(a*x)^3*x^4*a^4+48*arctan(a*x)*x^4*a^4-138*arcta
n(a*x)^2*x^3*a^3+48*arctan(a*x)^3*x^2*a^2-12*a^3*x^3+28*arctan(a*x)*a^2*x^2
+135*arctan(a*x)^2*x*a-96*arctan(a*x)^3+4*a*x-326*arctan(a*x))+17/560*c*(c*
(a*x-I)*(I+a*x))^(1/2)*(-I*arctan(a*x)^3+3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+
6*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^4/(a^2*x^2+1)^(1/2)-17/560*c*
(c*(a*x-I)*(I+a*x))^(1/2)*(-I*arctan(a*x)^3+3*arctan(a*x)^2*ln(1+I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/
2))+6*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^4/(a^2*x^2+1)^(1/2)-23/6
0*I*c/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^
2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{3}{2}} x^3 \arctan\left(ax\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^3*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 \operatorname{atan}(a\,x)^3 \left(c\,a^2\,x^2+c\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^3 \left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}} \operatorname{atan}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**(3/2)*atan(a*x)**3,x)
```

```
[Out] Integral(x**3*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3, x)
```

3.421 $\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=882

$$\frac{1}{6}a^2c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3x^5-\frac{1}{10}ac\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^2x^4+\frac{7}{24}c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3x^3+\frac{1}{20}c\sqrt{a^2cx^2+c}$$

```
[Out] -1/60*(a^2*c*x^2+c)^(3/2)/a^3+1/8*I*c^2*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))
*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3/8*I*c^2*polylog(
4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+
3/8*I*c^2*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(
a^2*c*x^2+c)^(1/2)+3/16*I*c^2*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3/16*I*c^2*arctan(a*x)^
2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^
2+c)^(1/2)+41/60*I*c^2*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*
(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+3/8*c^2*arctan(a*x)*polylog(3,-I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3/8*
c^2*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/
a^3/(a^2*c*x^2+c)^(1/2)-41/120*I*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)
^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+41/120*I*c^2*polylog(2,I*
(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-
1/30*c*(a^2*c*x^2+c)^(1/2)/a^3+1/12*c*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2
+1/20*c*x^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)+31/240*c*arctan(a*x)^2*(a^2*c*x
^2+c)^(1/2)/a^3-19/120*c*x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a-1/10*a*c*x
^4*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)+1/16*c*x*arctan(a*x)^3*(a^2*c*x^2+c)^(
1/2)/a^2+7/24*c*x^3*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)+1/6*a^2*c*x^5*arctan(
a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 5.47, antiderivative size = 882, normalized size of antiderivative = 1.00, number of steps used = 108, number of rules used = 14, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4950, 4952, 4930, 4890, 4886, 4888, 4181, 2531, 6609, 2282, 6589, 261, 266, 43}

$$\frac{1}{6}a^2c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3x^5-\frac{1}{10}ac\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^2x^4+\frac{7}{24}c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3x^3+\frac{1}{20}c\sqrt{a^2cx^2+c}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] -(c*Sqrt[c + a^2*c*x^2])/(30*a^3) - (c + a^2*c*x^2)^(3/2)/(60*a^3) + (c*x*S
qrt[c + a^2*c*x^2]*ArcTan[a*x])/(12*a^2) + (c*x^3*Sqrt[c + a^2*c*x^2]*ArcTa
n[a*x])/20 + (31*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(240*a^3) - (19*c*x^2
*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(120*a) - (a*c*x^4*Sqrt[c + a^2*c*x^2]*
ArcTan[a*x]^2)/10 + (c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(16*a^2) + (7*c
*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/24 + (a^2*c*x^5*Sqrt[c + a^2*c*x^2]
*ArcTan[a*x]^3)/6 + ((I/8)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*
ArcTan[a*x]^3)/(a^3*Sqrt[c + a^2*c*x^2]) + (((41*I)/60)*c^2*Sqrt[1 + a^2*x^
2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c
*x^2]) - (((3*I)/16)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^
(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + (((3*I)/16)*c^2*Sqrt[1 + a^2*
x^2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2
]) - (((41*I)/120)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/
Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + (((41*I)/120)*c^2*Sqrt[1 + a^
2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c
*x^2]) + (3*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a
*x])])/(8*a^3*Sqrt[c + a^2*c*x^2]) - (3*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*P
```

```
olyLog[3, I*E^(I*ArcTan[a*x])])/(8*a^3*Sqrt[c + a^2*c*x^2]) + (((3*I)/8)*c^
2*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c
*x^2]) - (((3*I)/8)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/
(a^3*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
```

```
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3\,dx = c\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx + \left(a^2c\right)\int x^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx$$

$$= c^2\int\frac{x^2\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx + 2\left(\left(a^2c^2\right)\int\frac{x^4\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx\right) + \left(a^4c^2\right)\int\frac{x^6\tan^{-1}(}{\sqrt{c+a^2}}$$

$$= \frac{cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2} + \frac{1}{6}a^2cx^5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{c^2\int\frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,d}{2a^2}$$

$$= -\frac{3c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3} - \frac{1}{10}acx^4\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{cx\sqrt{c+a^2cx^2}}{2a^2}$$

$$= \frac{1}{20}cx^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3} + \frac{41cx^2\sqrt{c+a^2cx^2}}{120a}$$

$$= -\frac{5cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^2} + \frac{1}{20}cx^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{749c\sqrt{c+a^2cx^2}}{240a}$$

$$= \frac{5c\sqrt{c+a^2cx^2}}{12a^3} - \frac{5cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^2} + \frac{1}{20}cx^3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) -$$

$$= \frac{7c\sqrt{c+a^2cx^2}}{15a^3} - \frac{\left(c+a^2cx^2\right)^{3/2}}{60a^3} - \frac{5cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^2} + \frac{1}{20}cx^3\sqrt{c+a^2}$$

$$= \frac{7c\sqrt{c+a^2cx^2}}{15a^3} - \frac{\left(c+a^2cx^2\right)^{3/2}}{60a^3} - \frac{5cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^2} + \frac{1}{20}cx^3\sqrt{c+a^2}$$

$$= \frac{7c\sqrt{c+a^2cx^2}}{15a^3} - \frac{\left(c+a^2cx^2\right)^{3/2}}{60a^3} - \frac{5cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^2} + \frac{1}{20}cx^3\sqrt{c+a^2}$$

$$= \frac{7c\sqrt{c+a^2cx^2}}{15a^3} - \frac{\left(c+a^2cx^2\right)^{3/2}}{60a^3} - \frac{5cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^2} + \frac{1}{20}cx^3\sqrt{c+a^2}$$

$$= \frac{7c\sqrt{c+a^2cx^2}}{15a^3} - \frac{\left(c+a^2cx^2\right)^{3/2}}{60a^3} - \frac{5cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{12a^2} + \frac{1}{20}cx^3\sqrt{c+a^2}$$

Mathematica [B] time = 18.27, size = 4015, normalized size = 4.55

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*((Sqrt[c*(1 + a^2*x^2)]*(-1 + ArcTan[a*x]^2))/(4*Sqrt[1 + a^2*x^2]) + (S
qrt[c*(1 + a^2*x^2)]*(-(ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 +
 I*E^(I*ArcTan[a*x])])) - I*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2
, I*E^(I*ArcTan[a*x])])))/(2*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*(-
1/8*(Pi^3*Log[Cot[(Pi/2 - ArcTan[a*x])/2]]) - (3*Pi^2*((Pi/2 - ArcTan[a*x])
*(Log[1 - E^(I*(Pi/2 - ArcTan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]
```

```
) + I*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - Ar
cTan[a*x]))])))/4 + (3*Pi*((Pi/2 - ArcTan[a*x])^2*(Log[1 - E^(I*(Pi/2 - Arc
Tan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + (2*I)*(Pi/2 - ArcTan[a
*x])*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - Arc
Tan[a*x]))]) + 2*(-PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))] + PolyLog[3, E^(
I*(Pi/2 - ArcTan[a*x]))])))/2 - 8*((I/64)*(Pi/2 - ArcTan[a*x])^4 + (I/4)*(P
i/2 + (-1/2*Pi + ArcTan[a*x])/2)^4 - ((Pi/2 - ArcTan[a*x])^3*Log[1 + E^(I*(
Pi/2 - ArcTan[a*x]))])/8 - (Pi^3*(I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2) - Lo
g[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi
+ ArcTan[a*x])/2)^3*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] +
 ((3*I)/8)*(Pi/2 - ArcTan[a*x])^2*PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] +
 (3*Pi^2*((I/2)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + A
rcTan[a*x])/2)*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + (I/2
)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/4 + ((3*I)/2)
*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi
 + ArcTan[a*x])/2))] - (3*(Pi/2 - ArcTan[a*x])*PolyLog[3, -E^(I*(Pi/2 - Arc
Tan[a*x]))])/4 - (3*Pi*((I/3)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3 - (Pi/2
+ (-1/2*Pi + ArcTan[a*x])/2)^2*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a
*x])/2))] + I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2
 + (-1/2*Pi + ArcTan[a*x])/2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + A
rcTan[a*x])/2))]/2))/2 - (3*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[3, -
E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^
(I*(Pi/2 - ArcTan[a*x]))] - ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi
 + ArcTan[a*x])/2))])))/(8*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*ArcT
an[a*x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^
4) + (Sqrt[c*(1 + a^2*x^2)]*(2*ArcTan[a*x] - ArcTan[a*x]^2 - ArcTan[a*x]^3)
)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^2) - (Sqr
t[c*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^2]*(
Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^3) - (Sqrt[c*(1 + a^2*x^2)]*ArcTan
[a*x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^4)
 + (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2
*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]
*(-2*ArcTan[a*x] - ArcTan[a*x]^2 + ArcTan[a*x]^3))/(16*Sqrt[1 + a^2*x^2]*(C
os[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^2) + (Sqrt[c*(1 + a^2*x^2)]*(Sin[Ar
cTan[a*x]/2] - ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos
[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])) + (Sqrt[c*(1 + a^2*x^2)]*(-Sin[ArcTa
n[a*x]/2] + ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos[Ar
cTan[a*x]/2] - Sin[ArcTan[a*x]/2]))))/a^3 + (c*((Sqrt[c*(1 + a^2*x^2)]*(50
- 19*ArcTan[a*x]^2))/(240*Sqrt[1 + a^2*x^2]) + (19*Sqrt[c*(1 + a^2*x^2)]*(A
rcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) +
I*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2, I*E^(I*ArcTan[a*x])])))/
(120*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*((Pi^3*Log[Cot[(Pi/2 - Arc
Tan[a*x])/2]])/8 + (3*Pi^2*((Pi/2 - ArcTan[a*x])*(Log[1 - E^(I*(Pi/2 - ArcT
an[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + I*(PolyLog[2, -E^(I*(Pi
/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTan[a*x]))])))/4 - (3*Pi*(
(Pi/2 - ArcTan[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcTan[a*x]))] - Log[1 + E^(I*
(Pi/2 - ArcTan[a*x]))]) + (2*I)*(Pi/2 - ArcTan[a*x])*(PolyLog[2, -E^(I*(Pi/
2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTan[a*x]))]) + 2*(-PolyLog[
3, -E^(I*(Pi/2 - ArcTan[a*x]))] + PolyLog[3, E^(I*(Pi/2 - ArcTan[a*x]))])))
/2 + 8*((I/64)*(Pi/2 - ArcTan[a*x])^4 + (I/4)*(Pi/2 + (-1/2*Pi + ArcTan[a*x
])/2)^4 - ((Pi/2 - ArcTan[a*x])^3*Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))])/8 -
(Pi^3*(I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2) - Log[1 + E^((2*I)*(Pi/2 + (-1/
2*Pi + ArcTan[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3*Log[1 +
 E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + ((3*I)/8)*(Pi/2 - ArcTan[a
*x])^2*PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] + (3*Pi^2*((I/2)*(Pi/2 + (-1
/2*Pi + ArcTan[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*Log[1 + E^((
2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + (I/2)*PolyLog[2, -E^((2*I)*(Pi/
2 + (-1/2*Pi + ArcTan[a*x])/2))]))/4 + ((3*I)/2)*(Pi/2 + (-1/2*Pi + ArcTan[
a*x])/2)^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] - (3*(
```

```
Pi/2 - ArcTan[a*x])*PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))])/4 - (3*Pi*((I/
3)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3 - (Pi/2 + (-1/2*Pi + ArcTan[a*x])/2
)^2*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + I*(Pi/2 + (-1/2
*Pi + ArcTan[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/
2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]/2))/2 - (3
*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi +
 ArcTan[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^(I*(Pi/2 - ArcTan[a*x]))] -
 ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))])))/(16
*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^3)/(48*Sqrt[1 + a^
2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^6) + (Sqrt[c*(1 + a^2*x^2)
]*(ArcTan[a*x] - ArcTan[a*x]^2 - 5*ArcTan[a*x]^3))/(80*Sqrt[1 + a^2*x^2]*(C
os[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^4) + (Sqrt[c*(1 + a^2*x^2)]*(-2 - 5
2*ArcTan[a*x] + 26*ArcTan[a*x]^2 + 15*ArcTan[a*x]^3))/(480*Sqrt[1 + a^2*x^2
]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^2) - (Sqrt[c*(1 + a^2*x^2)]*Arc
Tan[a*x]^2*Sin[ArcTan[a*x]/2])/(40*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] -
Sin[ArcTan[a*x]/2])^5) - (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^3)/(48*Sqrt[1 +
 a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^6) + (Sqrt[c*(1 + a^2*x
^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(40*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*
x]/2] + Sin[ArcTan[a*x]/2])^5) + (Sqrt[c*(1 + a^2*x^2)]*(-ArcTan[a*x] - Arc
Tan[a*x]^2 + 5*ArcTan[a*x]^3))/(80*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] +
Sin[ArcTan[a*x]/2])^4) + (Sqrt[c*(1 + a^2*x^2)]*(-2 + 52*ArcTan[a*x] + 26*A
rcTan[a*x]^2 - 15*ArcTan[a*x]^3))/(480*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2
] + Sin[ArcTan[a*x]/2])^2) + (Sqrt[c*(1 + a^2*x^2)]*(50*Sin[ArcTan[a*x]/2]
- 19*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(240*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[
a*x]/2] - Sin[ArcTan[a*x]/2])) + (Sqrt[c*(1 + a^2*x^2)]*(Sin[ArcTan[a*x]/2]
 - 13*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(120*Sqrt[1 + a^2*x^2]*(Cos[ArcTan
[a*x]/2] + Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]*(-Sin[ArcTan[a*x
]/2] + 13*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(120*Sqrt[1 + a^2*x^2]*(Cos[Ar
cTan[a*x]/2] - Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]*(-50*Sin[Arc
Tan[a*x]/2] + 19*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(240*Sqrt[1 + a^2*x^2]*
(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2]))))/a^3
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^4 + cx^2\right)\sqrt{a^2cx^2 + c}\ \arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^4 + c*x^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x)^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.86, size = 514, normalized size = 0.58

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(40\arctan\left(ax\right)^3x^5a^5 - 24\arctan\left(ax\right)^2x^4a^4 + 70\arctan\left(ax\right)^3a^3x^3 + 12\arctan\left(ax\right)x^3a^3 - \cdots\right.}{240a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x)
```

```
[Out] 1/240*c/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(40*arctan(a*x)^3*x^5*a^5-24*arctan(a
*x)^2*x^4*a^4+70*arctan(a*x)^3*a^3*x^3+12*arctan(a*x)*x^3*a^3-38*arctan(a*x
)^2*x^2*a^2+15*arctan(a*x)^3*x*a-4*a^2*x^2+20*arctan(a*x)*x*a+31*arctan(a*x
)^2-12)-1/240*c*(c*(a*x-I)*(I+a*x))^(1/2)*(15*arctan(a*x)^3*ln(1-I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))-45*I*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))-15*arctan(a*x)^3*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+45*I*arctan(a*x)
^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+82*arctan(a*x)*ln(1-I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))+90*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)
)+90*I*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-82*arctan(a*x)*ln(1+I*(1+I*
a*x)/(a^2*x^2+1)^(1/2))-90*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))-90*I*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+82*I*dilog(1+I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))-82*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^3/(a^2
*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{3}{2}} x^2 \arctan\left(ax\right)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^2*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2 \operatorname{atan}\left(a\,x\right)^3 \left(c\,a^2\,x^2 + c\right)^{3/2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2 \left(c\left(a^2x^2 + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^3\left(ax\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(3/2)*atan(a*x)**3,x)
```

```
[Out] Integral(x**2*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3, x)
```

3.422 $\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=477

$$-\frac{c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)}{2a^2}-\frac{9ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{20a^2\sqrt{a^2cx^2+c}}+\frac{9ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{20a^2\sqrt{a^2cx^2+c}}+\cdots$$

```
[Out] 1/10*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/a^2-3/20*x*(a^2*c*x^2+c)^(3/2)*arctan(
a*x)^2/a+1/5*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/a^2/c-1/2*c^(3/2)*arctanh(a*
x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^2+9/20*I*c^2*arctan((1+I*a*x)/(a^2*x^2+1)^
(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-9/20*I*c^2*a
rctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/
(a^2*c*x^2+c)^(1/2)+9/20*I*c^2*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+9/20*c^2*polylog(3,-I*(1
+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-9/20*c
^2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^
2+c)^(1/2)-1/20*c*x*(a^2*c*x^2+c)^(1/2)/a+9/20*c*arctan(a*x)*(a^2*c*x^2+c)^
(1/2)/a^2-9/40*c*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.42, antiderivative size = 477, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4930, 4880, 4890, 4888, 4181, 2531, 2282, 6589, 217, 206, 195}

$$-\frac{9ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{20a^2\sqrt{a^2cx^2+c}}+\frac{9ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{20a^2\sqrt{a^2cx^2+c}}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] -(c*x*Sqrt[c + a^2*c*x^2])/(20*a) + (9*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(
20*a^2) + ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/(10*a^2) - (9*c*x*Sqrt[c + a^
2*c*x^2]*ArcTan[a*x]^2)/(40*a) - (3*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/
(20*a) + (((9*I)/20)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan
[a*x]^2)/(a^2*Sqrt[c + a^2*c*x^2]) + ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/
(5*a^2*c) - (c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(2*a^2) -
(((9*I)/20)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a
*x])])/(a^2*Sqrt[c + a^2*c*x^2]) + (((9*I)/20)*c^2*Sqrt[1 + a^2*x^2]*ArcTan
[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^2*Sqrt[c + a^2*c*x^2]) + (9*c^2*S
qrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(20*a^2*Sqrt[c + a^2*c
*x^2]) - (9*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(20*a^2*
Sqrt[c + a^2*c*x^2])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3\,dx=\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}{5a^2c}-\frac{3\int\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx}{5a}$$

$$=\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-\frac{3x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{20a}+\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-}}{5a^2c}$$

$$=-\frac{cx\sqrt{c+a^2cx^2}}{20a}+\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-9cx$$

$$=-\frac{cx\sqrt{c+a^2cx^2}}{20a}+\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-9cx$$

$$=-\frac{cx\sqrt{c+a^2cx^2}}{20a}+\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-9cx$$

$$=-\frac{cx\sqrt{c+a^2cx^2}}{20a}+\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-9cx$$

$$=-\frac{cx\sqrt{c+a^2cx^2}}{20a}+\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-9cx$$

$$=-\frac{cx\sqrt{c+a^2cx^2}}{20a}+\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-9cx$$

$$=-\frac{cx\sqrt{c+a^2cx^2}}{20a}+\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{20a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{10a^2}-9cx$$

Mathematica [A] time = 3.99, size = 441, normalized size = 0.92

$$c\sqrt{a^2cx^2+c}\left(960\left(-\tanh^{-1}\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)-i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+i\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)+\text{Li}_3\left(-ie^{i\tan}\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*(960*(I*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 - Ar
cTanh[(a*x)/Sqrt[1 + a^2*x^2]] - I*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[
a*x])] + I*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + PolyLog[3, (-I)*E^
(I*ArcTan[a*x])] - PolyLog[3, I*E^(I*ArcTan[a*x])]) + 48*((-11*I)*ArcTan[E^
(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 10*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] + (11*
I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (11*I)*ArcTan[a*x]*Poly
Log[2, I*E^(I*ArcTan[a*x])] - 11*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 11*Po
lyLog[3, I*E^(I*ArcTan[a*x])]) + 80*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]*(6 + 4*
```

```
ArcTan[a*x]^2 + 6*Cos[2*ArcTan[a*x]] - 3*ArcTan[a*x]*Sin[2*ArcTan[a*x]]) -
(1 + a^2*x^2)^(5/2)*((48*a*x)/(1 + a^2*x^2)^2 + 32*ArcTan[a*x]^3*(-1 + 5*Co
s[2*ArcTan[a*x]]) + 6*ArcTan[a*x]*(25 + 36*Cos[2*ArcTan[a*x]] + 11*Cos[4*Ar
cTan[a*x]]) + ArcTan[a*x]^2*(6*Sin[2*ArcTan[a*x]] - 33*Sin[4*ArcTan[a*x]]))
))/(960*a^2*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^3+cx\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^3 + c*x)*sqrt(a^2*c*x^2 + c)*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.32, size = 421, normalized size = 0.88

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(8\arctan\left(ax\right)^3x^4a^4-6\arctan\left(ax\right)^2x^3a^3+16\arctan\left(ax\right)^3x^2a^2+4\arctan\left(ax\right)a^2x^2-1\right.}{40a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x)
```

```
[Out] 1/40*c/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(8*arctan(a*x)^3*x^4*a^4-6*arctan(a*x)
^2*x^3*a^3+16*arctan(a*x)^3*x^2*a^2+4*arctan(a*x)*a^2*x^2-15*arctan(a*x)^2*
x*a+8*arctan(a*x)^3-2*a*x+22*arctan(a*x))-3/40*c*(c*(a*x-I)*(I+a*x))^(1/2)*
(-I*arctan(a*x)^3+3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*a
rctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(3,I*(1+I*a*x)
/(a^2*x^2+1)^(1/2)))/a^2/(a^2*x^2+1)^(1/2)+3/40*c*(c*(a*x-I)*(I+a*x))^(1/2)
*(-I*arctan(a*x)^3+3*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*
arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(3,-I*(1+I*a
*x)/(a^2*x^2+1)^(1/2)))/a^2/(a^2*x^2+1)^(1/2)+I*c/a^2*(c*(a*x-I)*(I+a*x))^(
1/2)*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a^2cx^2+c\right)^{\frac{3}{2}}x\arctan\left(ax\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^3*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x*atan(a*x)^3*(c + a^2*c*x^2)^(3/2), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)*atan(a*x)**3,x)
```

```
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3, x)
```

3.423 $\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=760

$$\frac{5ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}-\frac{5ic^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}+\frac{9ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{8a\sqrt{a^2cx^2+c}}-\frac{9ic^2}{}$$

```
[Out] -1/4*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/a+1/4*x*(a^2*c*x^2+c)^(3/2)*arctan(a
*x)^3-3/4*I*c^2*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+
1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+5/2*I*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*
a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-5*I*c^2*arctan(a*x)*arc
tan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2
)-5/2*I*c^2*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/
a/(a^2*c*x^2+c)^(1/2)+9/8*I*c^2*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x
^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-9/4*I*c^2*polylog(4,-I
*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-9/4*c
^2*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/
a/(a^2*c*x^2+c)^(1/2)+9/4*c^2*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+9/4*I*c^2*polylog(4,I*(1+I*
a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-9/8*I*c^2*a
rctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(
a^2*c*x^2+c)^(1/2)-1/4*c*(a^2*c*x^2+c)^(1/2)/a+1/4*c*x*arctan(a*x)*(a^2*c*x
^2+c)^(1/2)-9/8*c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a+3/8*c*x*arctan(a*x)^3
*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.52, antiderivative size = 760, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4880, 4890, 4888, 4181, 2531, 6609, 2282, 6589, 4886, 4878}

$$\frac{5ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}-\frac{5ic^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{2a\sqrt{a^2cx^2+c}}+\frac{9ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyL}}{8a\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] -(c*Sqrt[c + a^2*c*x^2])/(4*a) + (c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/4 -
(9*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(8*a) - ((c + a^2*c*x^2)^(3/2)*ArcT
an[a*x]^2)/(4*a) + (3*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/8 + (x*(c + a^
2*c*x^2)^(3/2)*ArcTan[a*x]^3)/4 - (((3*I)/4)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[E
^(I*ArcTan[a*x])]*ArcTan[a*x]^3)/(a*Sqrt[c + a^2*c*x^2]) - ((5*I)*c^2*Sqrt[
1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a*Sqrt[c
 + a^2*c*x^2]) + (((9*I)/8)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2,
(-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - (((9*I)/8)*c^2*Sqrt[1 +
a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x
^2]) + (((5*I)/2)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/S
qrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) - (((5*I)/2)*c^2*Sqrt[1 + a^2*x^2]
*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) -
 (9*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(
4*a*Sqrt[c + a^2*c*x^2]) + (9*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3,
I*E^(I*ArcTan[a*x])])/(4*a*Sqrt[c + a^2*c*x^2]) - (((9*I)/4)*c^2*Sqrt[1 + a
^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + (((9*
I)/4)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^
2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
```

```
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3\,dx = -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{4a}+\frac{1}{4}x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3+\frac{1}{2}c\int\sqrt{c+a^2c}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

$$= -\frac{c\sqrt{c+a^2cx^2}}{4a}+\frac{1}{4}cx\sqrt{c+a^2cx^2}\tan^{-1}(ax)-\frac{9c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{8a}-\frac{(c}{}$$

Mathematica [B] time = 12.84, size = 2105, normalized size = 2.77

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
```

```
[Out] ((-1/2*I)*c*Sqrt[c*(1 + a^2*x^2)]*(12*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]
 - (3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + I*a*x*Sqrt[1 + a^2*x^2]*ArcTan[a
*x]^3 + 2*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3 - 3*(2 + ArcTan[a*x]^2)*P
olyLog[2, (-I)*E^(I*ArcTan[a*x])] + 3*(2 + ArcTan[a*x]^2)*PolyLog[2, I*E^(I
*ArcTan[a*x])] - (6*I)*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + (6*
I)*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])] + 6*PolyLog[4, (-I)*E^(I*Arc
Tan[a*x])] - 6*PolyLog[4, I*E^(I*ArcTan[a*x])]))/(a*Sqrt[1 + a^2*x^2]) + (c
*((Sqrt[c*(1 + a^2*x^2)]*(-1 + ArcTan[a*x]^2))/(4*Sqrt[1 + a^2*x^2]) + (Sqr
t[c*(1 + a^2*x^2)]*(-(ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I
*E^(I*ArcTan[a*x])])) - I*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2,
I*E^(I*ArcTan[a*x])])))/(2*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*(-1/
8*(Pi^3*Log[Cot[(Pi/2 - ArcTan[a*x])/2]]) - (3*Pi^2*((Pi/2 - ArcTan[a*x])*(
Log[1 - E^(I*(Pi/2 - ArcTan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))])
+ I*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcT
an[a*x]))])))/4 + (3*Pi*((Pi/2 - ArcTan[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcTa
n[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + (2*I)*(Pi/2 - ArcTan[a*x
])*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTa
n[a*x]))]) + 2*(-PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))] + PolyLog[3, E^(I*
(Pi/2 - ArcTan[a*x]))])))/2 - 8*((I/64)*(Pi/2 - ArcTan[a*x])^4 + (I/4)*(Pi/
2 + (-1/2*Pi + ArcTan[a*x])/2)^4 - ((Pi/2 - ArcTan[a*x])^3*Log[1 + E^(I*(Pi
/2 - ArcTan[a*x]))])/8 - (Pi^3*(I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2) - Log[
1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi +
ArcTan[a*x])/2)^3*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + (
(3*I)/8)*(Pi/2 - ArcTan[a*x])^2*PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] + (
3*Pi^2*((I/2)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + Arc
Tan[a*x])/2)*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + (I/2)*
PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/4 + ((3*I)/2)*(
Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi +
 ArcTan[a*x])/2))] - (3*(Pi/2 - ArcTan[a*x])*PolyLog[3, -E^(I*(Pi/2 - ArcTa
n[a*x]))])/4 - (3*Pi*((I/3)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3 - (Pi/2 +
(-1/2*Pi + ArcTan[a*x])/2)^2*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x
])/2))] + I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2 +
 (-1/2*Pi + ArcTan[a*x])/2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + Arc
Tan[a*x])/2))]/2))/2 - (3*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[3, -E^
((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^(I
*(Pi/2 - ArcTan[a*x]))] - ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi +
 ArcTan[a*x])/2))])))/(8*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*ArcTan
[a*x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^4)
 + (Sqrt[c*(1 + a^2*x^2)]*(2*ArcTan[a*x] - ArcTan[a*x]^2 - ArcTan[a*x]^3))/
(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^2) - (Sqrt[
c*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^2]*(Co
s[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^3) - (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a
*x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^4) +
 (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x
^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]*(
-2*ArcTan[a*x] - ArcTan[a*x]^2 + ArcTan[a*x]^3))/(16*Sqrt[1 + a^2*x^2]*(Cos
[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^2) + (Sqrt[c*(1 + a^2*x^2)]*(Sin[ArcT
an[a*x]/2] - ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos[A
rcTan[a*x]/2] + Sin[ArcTan[a*x]/2])) + (Sqrt[c*(1 + a^2*x^2)]*(-Sin[ArcTan[
a*x]/2] + ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos[ArcT
an[a*x]/2] - Sin[ArcTan[a*x]/2]))))/a
```

fricas [F] time = 1.20, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.93, size = 466, normalized size = 0.61

$$\frac{c\sqrt{c\,(ax-i)\,(ax+i)}\;\left(2\arctan\left(ax\right)^{3}a^{3}x^{3}-2\arctan\left(ax\right)^{2}x^{2}a^{2}+5\arctan\left(ax\right)^{3}xa+2\arctan\left(ax\right)xa-11\,\mathrm{arc}\right.}{8a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x)
```

```
[Out] 1/8*c/a*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)^3*a^3*x^3-2*arctan(a*x)^2*
x^2*a^2+5*arctan(a*x)^3*x*a+2*arctan(a*x)*x*a-11*arctan(a*x)^2-2)+1/8*c*(c*
(a*x-I)*(I+a*x))^(1/2)*(3*arctan(a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
-9*I*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)^3
*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+9*I*arctan(a*x)^2*polylog(2,-I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))+20*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+18
*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+18*I*polylog(4,I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))-20*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
-18*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-18*I*polylog(4,-I
*(1+I*a*x)/(a^2*x^2+1)^(1/2))+20*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-2
0*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^{3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^3*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^{3}{\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**3,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3, x)
```

3.424 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x}\,dx$

Optimal. Leaf size=726

$$-c^{3/2}\tanh^{-1}\left(\frac{a\sqrt{c}\,x}{\sqrt{a^2cx^2+c}}\right)+\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3-c^(3/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^
2+c)^(1/2))+7*I*c^2*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a
^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-2*c^2*arctan(a*x)^3*arctanh((1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*c^2*polylog(4,-
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*c^2*
arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)-3*I*c^2*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2
))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+7*I*c^2*arctan((1+I*a*x)/(a^2*x^2+
1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*c^2*arctan(
a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c
)^(1/2)+7*c^2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)-7*c^2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+
1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*c^2*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2
+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-7*I*c^2*arctan(a*x)*polylo
g(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6
*I*c^2*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+
c)^(1/2)+c*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-1/2*a*c*x*arctan(a*x)^2*(a^2*c*x
^2+c)^(1/2)+c*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.14, antiderivative size = 726, normalized size of antiderivative = 1.00, number of steps used = 36, number of rules used = 15, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4950, 4958, 4956, 4183, 2531, 6609, 2282, 6589, 4930, 4890, 4888, 4181, 4880, 217, 206}

$$\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ic^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{7ic^2\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x,x]
```

```
[Out] c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] - (a*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^
2)/2 + ((7*I)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2
)/Sqrt[c + a^2*c*x^2] + c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3 + ((c + a^2*c*x
^2)^(3/2)*ArcTan[a*x]^3)/3 - (2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh
[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - c^(3/2)*ArcTanh[(a*Sqrt[c]*x)/Sq
rt[c + a^2*c*x^2]] + ((3*I)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2,
-E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((7*I)*c^2*Sqrt[1 + a^2*x^2]*Arc
Tan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((7*I)*c
^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c +
a^2*c*x^2] - ((3*I)*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, E^(I*Arc
Tan[a*x])])/Sqrt[c + a^2*c*x^2] - (6*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Poly
Log[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (7*c^2*Sqrt[1 + a^2*x^2]*
PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (7*c^2*Sqrt[1 + a
^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (6*c^2*Sqrt[
1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
 - ((6*I)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[4, -E^(I*ArcTan[a*x])])/Sqrt[c + a^
2*c*x^2] + ((6*I)*c^2*Sqrt[1 + a^2*x^2]*PolyLog[4, E^(I*ArcTan[a*x])])/Sqrt
[c + a^2*c*x^2]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x}\,dx + \left(a^2c\right)\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx$$

$$= \frac{1}{3}\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3 - (ac)\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx + c^2\int \frac{\tan}{x\sqrt{c}}$$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + c\sqrt{c+a^2cx^2}\,\tan^{-1}($$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + c\sqrt{c+a^2cx^2}\,\tan^{-1}($$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + c\sqrt{c+a^2cx^2}\,\tan^{-1}($$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{7ic^2\sqrt{1+a^2x^2}\,\tan}{\sqrt{c}}$$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{7ic^2\sqrt{1+a^2x^2}\,\tan}{\sqrt{c}}$$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{7ic^2\sqrt{1+a^2x^2}\,\tan}{\sqrt{c}}$$

$$= c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{7ic^2\sqrt{1+a^2x^2}\,\tan}{\sqrt{c}}$$

Mathematica [A] time = 1.49, size = 555, normalized size = 0.76

$$c\sqrt{a^2cx^2+c}\left(\frac{40a^2x^2\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}} + \frac{24a^2x^2\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} - \frac{12ax\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}} + \frac{32\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}} + \frac{24\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} - 24\tanh^{-1}\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x,x]
```

```
[Out] (c*Sqrt[c + a^2*c*x^2]*((-3*I)*Pi^4 + (24*ArcTan[a*x])/Sqrt[1 + a^2*x^2] +
(24*a^2*x^2*ArcTan[a*x])/Sqrt[1 + a^2*x^2] - (12*a*x*ArcTan[a*x]^2)/Sqrt[1
+ a^2*x^2] - (12*a^3*x^3*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] + (24*I)*ArcTan[E
^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + (32*ArcTan[a*x]^3)/Sqrt[1 + a^2*x^2] + (4
0*a^2*x^2*ArcTan[a*x]^3)/Sqrt[1 + a^2*x^2] + (8*a^4*x^4*ArcTan[a*x]^3)/Sqrt
[1 + a^2*x^2] + (6*I)*ArcTan[a*x]^4 - 24*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] +
 24*ArcTan[a*x]^3*Log[1 - E^((-I)*ArcTan[a*x])] - 72*ArcTan[a*x]^2*Log[1 -
I*E^(I*ArcTan[a*x])] + 72*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] - 24*A
rcTan[a*x]^3*Log[1 + E^(I*ArcTan[a*x])] + (72*I)*ArcTan[a*x]^2*PolyLog[2, E
^((-I)*ArcTan[a*x])] + (72*I)*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])]
- (168*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (168*I)*ArcTan[a
*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + 144*ArcTan[a*x]*PolyLog[3, E^((-I)*Ar
cTan[a*x])] - 144*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] + 168*PolyLog[
3, (-I)*E^(I*ArcTan[a*x])] - 168*PolyLog[3, I*E^(I*ArcTan[a*x])] - (144*I)*
PolyLog[4, E^((-I)*ArcTan[a*x])] - (144*I)*PolyLog[4, -E^(I*ArcTan[a*x])]))
/(24*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.17, size = 511, normalized size = 0.70

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \arctan\left(ax\right)\left(2\arctan\left(ax\right)^2x^2a^2-3\arctan\left(ax\right)xa+8\arctan\left(ax\right)^2+6\right)}{6}+\frac{c\sqrt{c\left(ax-i\right)\left(ax+\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x,x)
```

```
[Out] 1/6*c*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(2*arctan(a*x)^2*x^2*a^2-3*arct
an(a*x)*x*a+8*arctan(a*x)^2+6)+1/2*c*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*
x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)^2*polylog(2,(1+I*a*x
)/(a^2*x^2+1)^(1/2))-2*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*
arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+7*arctan(a*x)^2*ln(1+
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-14*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2
*x^2+1)^(1/2))-7*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+14*I*arc
tan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+12*arctan(a*x)*polylog(3,
(1+I*a*x)/(a^2*x^2+1)^(1/2))+12*I*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))-12
*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-12*I*polylog(4,-(1+I*a
*x)/(a^2*x^2+1)^(1/2))+4*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))+14*polylog(3
,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-14*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)
))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3\left(ax\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**3/x,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3/x, x)
```

3.425 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^2}\,dx$

Optimal. Leaf size=901

$$-\frac{3iac^2\sqrt{a^2x^2+1}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{a^2cx^2+c}}+\frac{1}{2}a^2cx\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3-\frac{c\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3}{x}-\frac{6ac^2\sqrt{a^2}}{}$$

```
[Out] 9*I*a*c^2*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c
*x^2+c)^(1/2)+9/2*I*a*c^2*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a*c^2*arctan(a*x)^2*arctanh(
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*I*a*c^
2*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)+3*I*a*c^2*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a
^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*a*c^2*arctan(a*x)*polylog(2,(1+I*a*
x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a*c^2*arcta
n((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c
)^(1/2)-3*I*a*c^2*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^
(1/2)/(a^2*c*x^2+c)^(1/2)-9/2*I*a*c^2*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a*c^2*polylog(3,-
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-9*a*c^2*
arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)+9*a*c^2*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2
))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*a*c^2*polylog(3,(1+I*a*x)/(a^2*x
^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-9*I*a*c^2*polylog(4,-I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*a*c^2
*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)-3/2*a*c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)-c*arctan(a*x)^3*(
a^2*c*x^2+c)^(1/2)/x+1/2*a^2*c*x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.24, antiderivative size = 901, normalized size of antiderivative = 1.00, number of steps used = 37, number of rules used = 14, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4950, 4944, 4958, 4956, 4183, 2531, 2282, 6589, 4890, 4888, 4181, 6609, 4880, 4886}

$$-\frac{3iac^2\sqrt{a^2x^2+1}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{a^2cx^2+c}}+\frac{1}{2}a^2cx\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3-\frac{c\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3}{x}-\frac{6ac^2\sqrt{a^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] (-3*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/2 - (c*Sqrt[c + a^2*c*x^2]*ArcTa
n[a*x]^3)/x + (a^2*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/2 - ((3*I)*a*c^2*
Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x
^2] - ((6*I)*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqr
t[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (6*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]
^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((6*I)*a*c^2*Sqrt[1 +
a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] +
(((9*I)/2)*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTa
n[a*x])])/Sqrt[c + a^2*c*x^2] - (((9*I)/2)*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a
*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((6*I)*a*c^2*S
qrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*
x^2] + ((3*I)*a*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqr
t[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - ((3*I)*a*c^2*Sqrt[1 + a^2*x^2]*PolyLog
[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (6*a*c^2*Sq
rt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (9*a*
c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt[
```

```
c + a^2*c*x^2] + (9*a*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^(I*A
rcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (6*a*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, E
^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((9*I)*a*c^2*Sqrt[1 + a^2*x^2]*Pol
yLog[4, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((9*I)*a*c^2*Sqrt[1
+ a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
```

```
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^2}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^2}\,dx + \left(a^2c\right)\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3\,dx$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 + c^2\int \frac{\tan^{-1}}{x^2\sqrt{c+}}$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}$$

$$= -\frac{3}{2}ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} + \frac{1}{2}a^2cx\sqrt{c+a^2cx^2}$$

Mathematica [A] time = 7.07, size = 1387, normalized size = 1.54

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] (a*c*Sqrt[c + a^2*c*x^2]*((-7*I)*Pi^4*Sqrt[1 + a^2*x^2] - (8*I)*Pi^3*Sqrt[1
 + a^2*x^2]*ArcTan[a*x] - (384*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x]
)]*ArcTan[a*x] - 96*ArcTan[a*x]^2 - 96*a^2*x^2*ArcTan[a*x]^2 + (24*I)*Pi^2*
Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 - (64*ArcTan[a*x]^3)/(a*x) - 32*a*x*ArcTan[
a*x]^3 + 32*a^3*x^3*ArcTan[a*x]^3 - (32*I)*Pi*Sqrt[1 + a^2*x^2]*ArcTan[a*x]
^3 - (64*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3 + (16
*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^4 + 48*Pi^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]
*Log[1 - I/E^(I*ArcTan[a*x])] - 96*Pi*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Log[1
 - I/E^(I*ArcTan[a*x])] - 8*Pi^3*Sqrt[1 + a^2*x^2]*Log[1 + I/E^(I*ArcTan[a*
x])] + 64*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*Log[1 + I/E^(I*ArcTan[a*x])] + 19
2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Log[1 - E^(I*ArcTan[a*x])] + 8*Pi^3*Sqrt[
1 + a^2*x^2]*Log[1 + I*E^(I*ArcTan[a*x])] - 48*Pi^2*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] + 96*Pi*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2
*Log[1 + I*E^(I*ArcTan[a*x])] - 64*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*Log[1 +
I*E^(I*ArcTan[a*x])] - 192*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Log[1 + E^(I*Arc
Tan[a*x])] + 8*Pi^3*Sqrt[1 + a^2*x^2]*Log[2*Sqrt[1 + a^2*x^2]*Sin[(Pi + 2*A
rcTan[a*x])/4]^2] + (192*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)
/E^(I*ArcTan[a*x])] + (48*I)*Pi*Sqrt[1 + a^2*x^2]*(Pi - 4*ArcTan[a*x])*Poly
Log[2, I/E^(I*ArcTan[a*x])] + (384*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog
[2, -E^(I*ArcTan[a*x])] + (192*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, (-I)*E^(I*Ar
```

```
cTan[a*x])] + (48*I)*Pi^2*Sqrt[1 + a^2*x^2]*PolyLog[2, (-I)*E^(I*ArcTan[a*x
])] - (192*I)*Pi*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[
a*x])] + (288*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTa
n[a*x])] - (192*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, I*E^(I*ArcTan[a*x])] - (96*
I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])] - (384*I
)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] + 384*Sqrt[1
+ a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)/E^(I*ArcTan[a*x])] - 192*Pi*Sqrt[1 +
 a^2*x^2]*PolyLog[3, I/E^(I*ArcTan[a*x])] - 384*Sqrt[1 + a^2*x^2]*PolyLog[3
, -E^(I*ArcTan[a*x])] + 192*Pi*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTa
n[a*x])] - 576*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*
x])] + 192*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])] +
384*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])] - (384*I)*Sqrt[1 + a^2*
x^2]*PolyLog[4, (-I)/E^(I*ArcTan[a*x])] - (576*I)*Sqrt[1 + a^2*x^2]*PolyLog
[4, (-I)*E^(I*ArcTan[a*x])] + (192*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*A
rcTan[a*x])]))/(64*(1 + a^2*x^2))
```

fricas [F] time = 0.73, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.27, size = 602, normalized size = 0.67

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \arctan\left(ax\right)^2\left(\arctan\left(ax\right)a^2x^2-3ax-2\arctan\left(ax\right)\right)}{2x}-\frac{3iac\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(-6i\arctan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^2,x)
```

```
[Out] 1/2*c*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^2*(arctan(a*x)*a^2*x^2-3*a*x-2*
arctan(a*x))/x-3/2*I*a*c*(c*(a*x-I)*(I+a*x))^(1/2)*(-I*arctan(a*x)^3*ln(1+I
*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))+4*I*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan(a*x)*polylog(3
,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-4*I*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))
-3*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*arctan(a*x)*
ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
+I*arctan(a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+4*arctan(a*x)*polylog(
2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)
^(1/2))-4*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*arctan(a*
x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)
```

```
^(1/2))+6*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*polylog(2,I*(1+I*a*x)
/(a^2*x^2+1)^(1/2))-6*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)
^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x^2,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3\left(ax\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**3/x**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3/x**2, x)
```

3.426 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^3}\,dx$

Optimal. Leaf size=919

$$-\frac{3a^2c^2\sqrt{a^2x^2+1}\ \tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{a^2cx^2+c}}+a^2c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3-\frac{c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3}{2x^2}+\frac{6ia^2c^2\sqrt{a}}{}$$

```
[Out] -9*I*a^2*c^2*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)-3*a^2*c^2*arctan(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2)
)*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a^2*c^2*arctan(a*x)*arctanh((1+I*
a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*I*a^2*c
^2*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)-9/2*I*a^2*c^2*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)
^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^2*c^2*polylog(2,(1+I*a*
x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+9*I*a^2*c^2
*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/
2)+6*I*a^2*c^2*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^
2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+9/2*I*a^2*c^2*arctan(a*x)^2*polylog(2,-(1+I*
a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-9*a^2*c^2*arc
tan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x
^2+c)^(1/2)+6*a^2*c^2*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)
^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a^2*c^2*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2
))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+9*a^2*c^2*arctan(a*x)*polylog(3,(1
+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*a^2*c^
2*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)+3*I*a^2*c^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*
(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3/2*a*c*arctan(a*x)^2*(a^2*c*x^2+c)^(
1/2)/x+a^2*c*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)-1/2*c*arctan(a*x)^3*(a^2*c*x
^2+c)^(1/2)/x^2
```

Rubi [A] time = 2.02, antiderivative size = 919, normalized size of antiderivative = 1.00, number of steps used = 50, number of rules used = 15, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4950, 4962, 4944, 4958, 4954, 4956, 4183, 2531, 6609, 2282, 6589, 4930, 4890, 4888, 4181}

$$-\frac{3a^2c^2\sqrt{a^2x^2+1}\ \tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{a^2cx^2+c}}+a^2c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3-\frac{c\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^3}{2x^2}+\frac{6ia^2c^2\sqrt{a}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (-3*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*x) + ((6*I)*a^2*c^2*Sqrt[1 +
a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c + a^2*c*x^2] + a^2
*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3 - (c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3
)/(2*x^2) - (3*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*ArcTan[
a*x])])/Sqrt[c + a^2*c*x^2] - (6*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcT
anh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] + (((9*I)/2)*a^2*
c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c
+ a^2*c*x^2] - ((6*I)*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)
*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((6*I)*a^2*c^2*Sqrt[1 + a^2*x^2]
*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (((9*I)
/2)*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, E^(I*ArcTan[a*x])])/
Sqrt[c + a^2*c*x^2] + ((3*I)*a^2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1
+ I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^2*c^2*Sqrt[1 + a
^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] -
(9*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sq
```

```
rt[c + a^2*c*x^2] + (6*a^2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTa
n[a*x])])/Sqrt[c + a^2*c*x^2] - (6*a^2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E
^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (9*a^2*c^2*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((9*I)*a^2*c^2*
Sqrt[1 + a^2*x^2]*PolyLog[4, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((9
*I)*a^2*c^2*Sqrt[1 + a^2*x^2]*PolyLog[4, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c
*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^3}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^3}\,dx+\left(a^2c\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x}\,dx$$

$$= c^2\int \frac{\tan^{-1}(ax)^3}{x^3\sqrt{c+a^2cx^2}}\,dx+2\left(\left(a^2c^2\right)\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx\right)+\left(a^4c^2\right)\int \frac{x\tan^{-1}(}{\sqrt{c+a^2}}$$

$$= a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3-\frac{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2x^2}+\frac{1}{2}\left(3ac^2\right)\int \frac{\tan^{-1}(}{x^2\sqrt{c+}}$$

$$= -\frac{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x}+a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3-\frac{c\sqrt{c+a^2cx^2}\,\tan}{2x^2}$$

$$= -\frac{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x}+a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3-\frac{c\sqrt{c+a^2cx^2}\,\tan}{2x^2}$$

$$= -\frac{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x}+\frac{6ia^2c^2\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x}+\frac{6ia^2c^2\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x}+\frac{6ia^2c^2\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x}+\frac{6ia^2c^2\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x}+\frac{6ia^2c^2\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 9.52, size = 691, normalized size = 0.75

$$\frac{a^2c\sqrt{a^2cx^2+c}\,\tan\left(\frac{1}{2}\tan^{-1}(ax)\right)\left(72i\tan^{-1}(ax)^2\text{Li}_2\left(e^{-i\tan^{-1}(ax)}\right)\cot\left(\frac{1}{2}\tan^{-1}(ax)\right)-96i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (a^2*c*Sqrt[c + a^2*c*x^2]*(-12*ArcTan[a*x]^2 - (3*I)*Pi^4*Cot[ArcTan[a*x]/
2] + (6*I)*ArcTan[a*x]^4*Cot[ArcTan[a*x]/2] - 12*ArcTan[a*x]^2*Cot[ArcTan[a
*x]/2]^2 + 8*a*x*ArcTan[a*x]^3*Csc[ArcTan[a*x]/2]^2 - 2*ArcTan[a*x]^3*Cot[A
rcTan[a*x]/2]*Csc[ArcTan[a*x]/2]^2 + 24*ArcTan[a*x]^3*Cot[ArcTan[a*x]/2]*Lo
```

```
g[1 - E^((-I)*ArcTan[a*x])] + 48*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Log[1 - E^(
I*ArcTan[a*x])] - 48*ArcTan[a*x]^2*Cot[ArcTan[a*x]/2]*Log[1 - I*E^(I*ArcTan
[a*x])] + 48*ArcTan[a*x]^2*Cot[ArcTan[a*x]/2]*Log[1 + I*E^(I*ArcTan[a*x])]
- 48*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Log[1 + E^(I*ArcTan[a*x])] - 24*ArcTan[
a*x]^3*Cot[ArcTan[a*x]/2]*Log[1 + E^(I*ArcTan[a*x])] + (72*I)*ArcTan[a*x]^2
*Cot[ArcTan[a*x]/2]*PolyLog[2, E^((-I)*ArcTan[a*x])] + (24*I)*(2 + 3*ArcTan
[a*x]^2)*Cot[ArcTan[a*x]/2]*PolyLog[2, -E^(I*ArcTan[a*x])] - (96*I)*ArcTan[
a*x]*Cot[ArcTan[a*x]/2]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (96*I)*ArcTan[
a*x]*Cot[ArcTan[a*x]/2]*PolyLog[2, I*E^(I*ArcTan[a*x])] - (48*I)*Cot[ArcTan
[a*x]/2]*PolyLog[2, E^(I*ArcTan[a*x])] + 144*ArcTan[a*x]*Cot[ArcTan[a*x]/2]
*PolyLog[3, E^((-I)*ArcTan[a*x])] - 144*ArcTan[a*x]*Cot[ArcTan[a*x]/2]*Poly
Log[3, -E^(I*ArcTan[a*x])] + 96*Cot[ArcTan[a*x]/2]*PolyLog[3, (-I)*E^(I*Arc
Tan[a*x])] - 96*Cot[ArcTan[a*x]/2]*PolyLog[3, I*E^(I*ArcTan[a*x])] - (144*I
)*Cot[ArcTan[a*x]/2]*PolyLog[4, E^((-I)*ArcTan[a*x])] - (144*I)*Cot[ArcTan[
a*x]/2]*PolyLog[4, -E^(I*ArcTan[a*x])] + 2*ArcTan[a*x]^3*Csc[ArcTan[a*x]/2]
*Sec[ArcTan[a*x]/2])*Tan[ArcTan[a*x]/2])/(16*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.70, size = 592, normalized size = 0.64

$$\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \arctan\left(ax\right)^2\left(2\arctan\left(ax\right)a^2x^2-3ax-\arctan\left(ax\right)\right)}{2x^2}+\frac{3a^2c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(\arctan\left(ax\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^3,x)
```

```
[Out] 1/2*c*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)^2*(2*arctan(a*x)*a^2*x^2-3*a*x-
arctan(a*x))/x^2+3/2*a^2*c*(c*(a*x-I)*(I+a*x))^(1/2)*(arctan(a*x)^3*ln(1-(1
+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-arcta
n(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*polylog(4,-(1+I*a*x)/(a^2*x^
2+1)^(1/2))+2*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*I*arctan(
a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*arctan(a*x)^2*ln(1-I*(1+I*a
*x)/(a^2*x^2+1)^(1/2))+4*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))+2*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*polylog(2,-(1+I*a*
x)/(a^2*x^2+1)^(1/2))+6*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))+
6*I*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*arctan(a*x)*ln(1+(1+I*a*x)/(a^
2*x^2+1)^(1/2))-4*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6
```

```
*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+3*I*arctan(a*x)^2*poly
log(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+4*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))-4*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x^3,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3\left(ax\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**3/x**3,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3/x**3, x)
```

3.427 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^4}\,dx$

Optimal. Leaf size=788

$$-\frac{a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{x}-\frac{a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{x}-\frac{ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{2x^2}-\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^3}{3x^3}-a^3c$$

```
[Out] -1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^3-a^3*c^(3/2)*arctanh((a^2*c*x^2+c
)^(1/2)/c^(1/2))-2*I*a^3*c^2*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x
)^3*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-7*a^3*c^2*arctan(a*x)^2*arctanh((
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*a^3*c
^2*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2
)/(a^2*c*x^2+c)^(1/2)-7*I*a^3*c^2*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+7*I*a^3*c^2*arctan(a*x)*pol
ylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+
6*I*a^3*c^2*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)-7*a^3*c^2*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+
1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a^3*c^2*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*a^3*c^2*arctan(a*
x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)
^(1/2)+7*a^3*c^2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)-6*I*a^3*c^2*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a
^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^3*c^2*arctan(a*x)^2*polylog(2,I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a^2*c*arc
tan(a*x)*(a^2*c*x^2+c)^(1/2)/x-1/2*a*c*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^
2-a^2*c*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x
```

Rubi [A] time = 1.88, antiderivative size = 788, normalized size of antiderivative = 1.00, number of steps used = 48, number of rules used = 16, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4950, 4944, 4962, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589, 4890, 4888, 4181, 6609}

$$\frac{7ia^3c^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{3ia^3c^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ia^3}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] -((a^2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x) - (a*c*Sqrt[c + a^2*c*x^2]*Arc
Tan[a*x]^2)/(2*x^2) - (a^2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x - ((c + a
^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/(3*x^3) - ((2*I)*a^3*c^2*Sqrt[1 + a^2*x^2]*A
rcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2] - (7*a^3*c^2*Sq
rt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^
2] - a^3*c^(3/2)*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]] + ((7*I)*a^3*c^2*Sqrt
[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^
2] + ((3*I)*a^3*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*Ar
cTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^3*c^2*Sqrt[1 + a^2*x^2]*ArcTan[
a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((7*I)*a^3*c^
2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2
*c*x^2] - (7*a^3*c^2*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt
[c + a^2*c*x^2] - (6*a^3*c^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*
E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (6*a^3*c^2*Sqrt[1 + a^2*x^2]*ArcT
an[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (7*a^3*c^2*S
qrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((6*I
)*a^3*c^2*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^
2*c*x^2] + ((6*I)*a^3*c^2*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])]
)/Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
```

```
d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^4}\,dx = c\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^4}\,dx + \left(a^2c\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^2}\,dx$$

$$= -\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3x^3} + (ac)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{x^3}\,dx + \left(a^2c^2\right)\int$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{3x^3} + \left(ac^2\right)\int \frac{\tan^{-1}(}{x^3\sqrt{c+}}$$

$$= -\frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x} - \frac{\left(c+a^2cx^2\right)^{3/2}\tan}{3x^3}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan}{x}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan}{x}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan}{x}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan}{x}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan}{x}$$

$$= -\frac{a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} - \frac{a^2c\sqrt{c+a^2cx^2}\,\tan}{x}$$

Mathematica [A] time = 10.54, size = 1508, normalized size = 1.91

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] (a^3*c*Sqrt[c*(1 + a^2*x^2)]*Csc[ArcTan[a*x]/2]*(((-7*I)*a*Pi^4*x)/Sqrt[1 +
 a^2*x^2] - ((8*I)*a*Pi^3*x*ArcTan[a*x])/Sqrt[1 + a^2*x^2] + ((24*I)*a*Pi^2
*x*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] - 64*ArcTan[a*x]^3 - ((32*I)*a*Pi*x*Arc
Tan[a*x]^3)/Sqrt[1 + a^2*x^2] + ((16*I)*a*x*ArcTan[a*x]^4)/Sqrt[1 + a^2*x^2
] + (48*a*Pi^2*x*ArcTan[a*x]*Log[1 - I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2
] - (96*a*Pi*x*ArcTan[a*x]^2*Log[1 - I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2
] - (8*a*Pi^3*x*Log[1 + I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (64*a*x*A
rcTan[a*x]^3*Log[1 + I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (192*a*x*Arc
Tan[a*x]^2*Log[1 - E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (8*a*Pi^3*x*Log[
1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (48*a*Pi^2*x*ArcTan[a*x]*Log[
1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (96*a*Pi*x*ArcTan[a*x]^2*Log[
1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (64*a*x*ArcTan[a*x]^3*Log[1 +
 I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (192*a*x*ArcTan[a*x]^2*Log[1 + E
```

```
^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (8*a*Pi^3*x*Log[Tan[(Pi + 2*ArcTan[a
*x])/4]])/Sqrt[1 + a^2*x^2] + ((192*I)*a*x*ArcTan[a*x]^2*PolyLog[2, (-I)/E^
(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((48*I)*a*Pi*x*(Pi - 4*ArcTan[a*x])*P
olyLog[2, I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((384*I)*a*x*ArcTan[a*x
]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((48*I)*a*Pi^2*x*Poly
Log[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((192*I)*a*Pi*x*ArcTan[
a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((192*I)*a*x*A
rcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((384*
I)*a*x*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (384*
a*x*ArcTan[a*x]*PolyLog[3, (-I)/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (19
2*a*Pi*x*PolyLog[3, I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (384*a*x*Poly
Log[3, -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (192*a*Pi*x*PolyLog[3, (-I)
*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (384*a*x*ArcTan[a*x]*PolyLog[3, (-
I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (384*a*x*PolyLog[3, E^(I*ArcTan[
a*x])])/Sqrt[1 + a^2*x^2] - ((384*I)*a*x*PolyLog[4, (-I)/E^(I*ArcTan[a*x])]
)/Sqrt[1 + a^2*x^2] - ((384*I)*a*x*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/Sqrt
[1 + a^2*x^2])*Sec[ArcTan[a*x]/2])/(128*Sqrt[1 + a^2*x^2]) + (a^3*c^2*Sqrt[
1 + a^2*x^2]*(-12*ArcTan[a*x]*Cot[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Cot[ArcT
an[a*x]/2] - 3*ArcTan[a*x]^2*Csc[ArcTan[a*x]/2]^2 - (a*x*ArcTan[a*x]^3*Csc[
ArcTan[a*x]/2]^4)/(2*Sqrt[1 + a^2*x^2]) + 12*ArcTan[a*x]^2*Log[1 - E^(I*Arc
Tan[a*x])] - 12*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + 24*Log[Tan[ArcTa
n[a*x]/2]] + (24*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] - (24*I)*Arc
Tan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] - 24*PolyLog[3, -E^(I*ArcTan[a*x])]
+ 24*PolyLog[3, E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]^2*Sec[ArcTan[a*x]/2]^2 -
 (8*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^3*Sin[ArcTan[a*x]/2]^4)/(a^3*x^3) - 12*
ArcTan[a*x]*Tan[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Tan[ArcTan[a*x]/2]))/(24*S
qrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.98, size = 557, normalized size = 0.71

$$-\frac{c\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \arctan\left(ax\right)\left(8\arctan\left(ax\right)^2x^2a^2+6a^2x^2+3\arctan\left(ax\right)xa+2\arctan\left(ax\right)^2\right)}{6x^3}+\frac{ia^3c\sqrt{c\left(ax\right.}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^4,x)
```

```
[Out] -1/6*c*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(8*arctan(a*x)^2*x^2*a^2+6*a^2
*x^2+3*arctan(a*x)*x*a+2*arctan(a*x)^2)/x^3+1/2*I*a^3*c*(c*(a*x-I)*(I+a*x))
^(1/2)*(2*I*arctan(a*x)^3*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*ln(1+(1+I
*a*x)/(a^2*x^2+1)^(1/2))+12*I*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1
)^(1/2))-2*I*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)+6*arctan(a*x)^2*polylog(2,-I
*(1+I*a*x)/(a^2*x^2+1)^(1/2))-7*I*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^
(1/2))-6*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*arctan(
a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-14*arctan(a*x)*polylog(2,(1+I*a*
x)/(a^2*x^2+1)^(1/2))-14*I*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-12*I*arct
an(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+14*arctan(a*x)*polylog(2,-
(1+I*a*x)/(a^2*x^2+1)^(1/2))+7*I*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(
1/2))+14*I*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-12*polylog(4,-I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))+12*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+
1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^4,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3/x^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x^4,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(3/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3\left(ax\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**3/x**4,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3/x**4, x)
```

3.428 $\int x^3 \left(c + a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=798

$$\frac{1}{9}a^4c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^8-\frac{1}{24}a^3c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2x^7+\frac{19}{63}a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^6+\frac{1}{84}a^2c^2\sqrt{a^2c}$$

```
[Out] 1433/15120*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^4+115/1344*I*
c^3*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)
/a^4/(a^2*c*x^2+c)^(1/2)-115/1344*I*c^3*arctan(a*x)*polylog(2,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-115/1344*I*c^3*
arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^4/(a^
2*c*x^2+c)^(1/2)-115/1344*c^3*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^
2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+115/1344*c^3*polylog(3,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+85/12096*c^2*x*
(a^2*c*x^2+c)^(1/2)/a^3-1/240*c^2*x^3*(a^2*c*x^2+c)^(1/2)/a-1/504*a*c^2*x^5
*(a^2*c*x^2+c)^(1/2)-6157/60480*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^4-47/
30240*c^2*x^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2+67/2520*c^2*x^4*arctan(a*
x)*(a^2*c*x^2+c)^(1/2)+1/84*a^2*c^2*x^6*arctan(a*x)*(a^2*c*x^2+c)^(1/2)+47/
896*c^2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^3-205/4032*c^2*x^3*arctan(a*x
)^2*(a^2*c*x^2+c)^(1/2)/a-103/1008*a*c^2*x^5*arctan(a*x)^2*(a^2*c*x^2+c)^(1
/2)-1/24*a^3*c^2*x^7*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)-2/63*c^2*arctan(a*x)
^3*(a^2*c*x^2+c)^(1/2)/a^4+1/63*c^2*x^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a
^2+5/21*c^2*x^4*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)+19/63*a^2*c^2*x^6*arctan(
a*x)^3*(a^2*c*x^2+c)^(1/2)+1/9*a^4*c^2*x^8*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2
)
```

Rubi [A] time = 19.66, antiderivative size = 798, normalized size of antiderivative = 1.00, number of steps used = 547, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4950, 4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589, 321}

$$\frac{1}{9}a^4c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^8-\frac{1}{24}a^3c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2x^7+\frac{19}{63}a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^6+\frac{1}{84}a^2c^2\sqrt{a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

```
[Out] (85*c^2*x*Sqrt[c + a^2*c*x^2])/(12096*a^3) - (c^2*x^3*Sqrt[c + a^2*c*x^2])/
(240*a) - (a*c^2*x^5*Sqrt[c + a^2*c*x^2])/504 - (6157*c^2*Sqrt[c + a^2*c*x^
2]*ArcTan[a*x])/(60480*a^4) - (47*c^2*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/
(30240*a^2) + (67*c^2*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/2520 + (a^2*c^2*
x^6*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/84 + (47*c^2*x*Sqrt[c + a^2*c*x^2]*Arc
Tan[a*x]^2)/(896*a^3) - (205*c^2*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(40
32*a) - (103*a*c^2*x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/1008 - (a^3*c^2*x
^7*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/24 - (((115*I)/1344)*c^3*Sqrt[1 + a^2
*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^4*Sqrt[c + a^2*c*x^2]) -
(2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(63*a^4) + (c^2*x^2*Sqrt[c + a^2*
c*x^2]*ArcTan[a*x]^3)/(63*a^2) + (5*c^2*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
^3)/21 + (19*a^2*c^2*x^6*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/63 + (a^4*c^2*x
^8*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/9 + (1433*c^(5/2)*ArcTanh[(a*Sqrt[c]*
x)/Sqrt[c + a^2*c*x^2]])/(15120*a^4) + (((115*I)/1344)*c^3*Sqrt[1 + a^2*x^2
]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^4*Sqrt[c + a^2*c*x^2])
 - (((115*I)/1344)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcT
an[a*x])])/(a^4*Sqrt[c + a^2*c*x^2]) - (115*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3
, (-I)*E^(I*ArcTan[a*x])])/(1344*a^4*Sqrt[c + a^2*c*x^2]) + (115*c^3*Sqrt[1
 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(1344*a^4*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x^3 \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3\,dx = c\int x^3 \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3\,dx + \left(a^2c\right)\int x^5 \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3\,dx$$

Mathematica [A] time = 7.27, size = 850, normalized size = 1.07

$$c^2\sqrt{a^2cx^2+c}\left(-\left(\left(1536\left(711\cos\left(2\tan^{-1}(ax)\right)-126\cos\left(4\tan^{-1}(ax)\right)+105\cos\left(6\tan^{-1}(ax)\right)-178\right)\tan^{-1}(ax)^3\right.\right.\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*(774144*((-11*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[
a*x]^2 + 10*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] + (11*I)*ArcTan[a*x]*PolyLog[2
, (-I)*E^(I*ArcTan[a*x])] - (11*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x
])] - 11*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 11*PolyLog[3, I*E^(I*ArcTan[a
*x])]) + 256*((-16407*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 + 12788*Ar
cTanh[(a*x)/Sqrt[1 + a^2*x^2]] + (16407*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I
*ArcTan[a*x])] - (16407*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - 16
407*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 16407*PolyLog[3, I*E^(I*ArcTan[a*x
])]) - 16128*(1 + a^2*x^2)^(5/2)*((48*a*x)/(1 + a^2*x^2)^2 + 32*ArcTan[a*x]
^3*(-1 + 5*Cos[2*ArcTan[a*x]]) + 6*ArcTan[a*x]*(25 + 36*Cos[2*ArcTan[a*x]]
+ 11*Cos[4*ArcTan[a*x]]) + ArcTan[a*x]^2*(6*Sin[2*ArcTan[a*x]] - 33*Sin[4*A
rcTan[a*x]])) + 576*(64*((309*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 -
```

```
259*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - (309*I)*ArcTan[a*x]*PolyLog[2, (-I)*
E^(I*ArcTan[a*x])] + (309*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] +
309*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 309*PolyLog[3, I*E^(I*ArcTan[a*x])
]) + (1 + a^2*x^2)^(7/2)*(64*ArcTan[a*x]^3*(57 - 28*Cos[2*ArcTan[a*x]] + 35
*Cos[4*ArcTan[a*x]]) + (8*ArcTan[a*x]*(647 + 764*Cos[2*ArcTan[a*x]] + 309*C
os[4*ArcTan[a*x]]))/(1 + a^2*x^2) + 4*(101*Sin[2*ArcTan[a*x]] + 88*Sin[4*Ar
cTan[a*x]] + 25*Sin[6*ArcTan[a*x]]) - 3*ArcTan[a*x]^2*(211*Sin[2*ArcTan[a*x
]] - 60*Sin[4*ArcTan[a*x]] + 103*Sin[6*ArcTan[a*x]]))) - (1 + a^2*x^2)^(9/2
)*(1536*ArcTan[a*x]^3*(-178 + 711*Cos[2*ArcTan[a*x]] - 126*Cos[4*ArcTan[a*x
]] + 105*Cos[6*ArcTan[a*x]]) + (8*ArcTan[a*x]*(87630 + 153529*Cos[2*ArcTan[
a*x]] + 59266*Cos[4*ArcTan[a*x]] + 16407*Cos[6*ArcTan[a*x]]))/(1 + a^2*x^2)
 + 74932*Sin[2*ArcTan[a*x]] + 77908*Sin[4*ArcTan[a*x]] + 36612*Sin[6*ArcTan
[a*x]] + 3*ArcTan[a*x]^2*(13074*Sin[2*ArcTan[a*x]] - 26742*Sin[4*ArcTan[a*x
]] + 6362*Sin[6*ArcTan[a*x]] - 5469*Sin[8*ArcTan[a*x]]) + 7238*Sin[8*ArcTan
[a*x]])))/(15482880*a^4*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^7 + 2\,a^2c^2x^5 + c^2x^3\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3)*sqrt(a^2*c*x^2 + c)*arctan
(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.85, size = 525, normalized size = 0.66

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(13440\arctan\left(ax\right)^3x^8a^8 - 5040\arctan\left(ax\right)^2x^7a^7 + 36480\arctan\left(ax\right)^3x^6a^6 + 1440\,\text{arc}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x)
```

```
[Out] 1/120960*c^2/a^4*(c*(a*x-I)*(I+a*x))^(1/2)*(13440*arctan(a*x)^3*x^8*a^8-504
0*arctan(a*x)^2*x^7*a^7+36480*arctan(a*x)^3*x^6*a^6+1440*arctan(a*x)*x^6*a^
6-12360*arctan(a*x)^2*x^5*a^5+28800*arctan(a*x)^3*x^4*a^4-240*x^5*a^5+3216*
arctan(a*x)*x^4*a^4-6150*arctan(a*x)^2*x^3*a^3+1920*arctan(a*x)^3*x^2*a^2-5
04*a^3*x^3-188*arctan(a*x)*a^2*x^2+6345*arctan(a*x)^2*x*a-3840*arctan(a*x)^
3+850*a*x-12314*arctan(a*x))+115/8064*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(-I*arc
tan(a*x)^3+3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a
*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(3,I*(1+I*a*x)/(a^2*x
^2+1)^(1/2)))/a^4/(a^2*x^2+1)^(1/2)-115/8064*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*
(-I*arctan(a*x)^3+3*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*a
rctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(3,-I*(1+I*a*
x)/(a^2*x^2+1)^(1/2)))/a^4/(a^2*x^2+1)^(1/2)-1433/7560*I*c^2/a^4*(c*(a*x-I)
*(I+a*x))^(1/2)*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{5}{2}} x^3 \arctan\left(ax\right)^3 \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^3*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3 \operatorname{atan}\left(a\,x\right)^3 \left(c\,a^2\,x^2 + c\right)^{5/2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(5/2),x)
[Out] int(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a**2*c*x**2+c)**(5/2)*atan(a*x)**3,x)
[Out] Timed out
```

3.429 $\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=1019

$$\frac{1}{8}a^4c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^7-\frac{3}{56}a^3c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2x^6+\frac{17}{48}a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^5+\frac{1}{56}a^2c^2\sqrt{}$$

```
[Out] -3/560*c*(a^2*c*x^2+c)^(3/2)/a^3-1/280*(a^2*c*x^2+c)^(5/2)/a^3+15/64*I*c^3*
polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+
c)^(1/2)+397/840*I*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*
(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-15/64*I*c^3*polylog(4,I*(1+I*a*x)
/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+5/64*I*c^3*ar
ctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a^3/(a^2*
c*x^2+c)^(1/2)-397/1680*I*c^3*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))
*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+15/128*I*c^3*arctan(a*x)^2*polyl
og(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/
2)+15/64*c^3*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2
+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-15/64*c^3*arctan(a*x)*polylog(3,I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+397/1680*I*
c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2
*c*x^2+c)^(1/2)-15/128*I*c^3*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+13/6720*c^2*(a^2*c*x^2+
c)^(1/2)/a^3+43/1344*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2+29/560*c^2*x
^3*arctan(a*x)*(a^2*c*x^2+c)^(1/2)+1/56*a^2*c^2*x^5*arctan(a*x)*(a^2*c*x^2+
c)^(1/2)+1373/13440*c^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^3-737/6720*c^2*
x^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a-83/560*a*c^2*x^4*arctan(a*x)^2*(a^2
*c*x^2+c)^(1/2)-3/56*a^3*c^2*x^6*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)+5/128*c^
2*x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^2+59/192*c^2*x^3*arctan(a*x)^3*(a^2
*c*x^2+c)^(1/2)+17/48*a^2*c^2*x^5*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)+1/8*a^4
*c^2*x^7*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 15.42, antiderivative size = 1019, normalized size of antiderivative = 1.00, number of steps used = 293, number of rules used = 14, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4950, 4952, 4930, 4890, 4886, 4888, 4181, 2531, 6609, 2282, 6589, 261, 266, 43}

$$\frac{1}{8}a^4c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^7-\frac{3}{56}a^3c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2x^6+\frac{17}{48}a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3x^5+\frac{1}{56}a^2c^2\sqrt{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

```
[Out] (13*c^2*Sqrt[c + a^2*c*x^2])/(6720*a^3) - (3*c*(c + a^2*c*x^2)^(3/2))/(560*
a^3) - (c + a^2*c*x^2)^(5/2)/(280*a^3) + (43*c^2*x*Sqrt[c + a^2*c*x^2]*ArcT
an[a*x])/(1344*a^2) + (29*c^2*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/560 + (a
^2*c^2*x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/56 + (1373*c^2*Sqrt[c + a^2*c*x
^2]*ArcTan[a*x]^2)/(13440*a^3) - (737*c^2*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*
x]^2)/(6720*a) - (83*a*c^2*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/560 - (3*
a^3*c^2*x^6*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/56 + (5*c^2*x*Sqrt[c + a^2*c
*x^2]*ArcTan[a*x]^3)/(128*a^2) + (59*c^2*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x
]^3)/192 + (17*a^2*c^2*x^5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/48 + (a^4*c^2
*x^7*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/8 + (((5*I)/64)*c^3*Sqrt[1 + a^2*x^
2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3)/(a^3*Sqrt[c + a^2*c*x^2]) + (((
397*I)/840)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1
 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) - (((15*I)/128)*c^3*Sqrt[1 + a^2*x^2]
*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]
```

```
) + (((15*I)/128)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*Arc
Tan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) - (((397*I)/1680)*c^3*Sqrt[1 + a^2*x^
2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*
x^2]) + (((397*I)/1680)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x]
)/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + (15*c^3*Sqrt[1 + a^2*x^2]*A
rcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(64*a^3*Sqrt[c + a^2*c*x^2])
 - (15*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(
64*a^3*Sqrt[c + a^2*c*x^2]) + (((15*I)/64)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[4,
 (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) - (((15*I)/64)*c^3*Sqrt
[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
```

```
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int x^2 \left(c + a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3 \, dx = c \int x^2 \left(c + a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx + \left(a^2c\right) \int x^4 \left(c + a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$$

$$= c^2 \int x^2\sqrt{c + a^2cx^2} \tan^{-1}(ax)^3 \, dx + 2\left(\left(a^2c^2\right) \int x^4\sqrt{c + a^2cx^2} \tan^{-1}(ax)^3 \, dx\right.$$

$$= c^3 \int \frac{x^2 \tan^{-1}(ax)^3}{\sqrt{c + a^2cx^2}} \, dx + \left(a^2c^3\right) \int \frac{x^4 \tan^{-1}(ax)^3}{\sqrt{c + a^2cx^2}} \, dx + \left(a^4c^3\right) \int \frac{x^6 \tan^{-1}(ax)}{\sqrt{c + a^2cx^2}}$$

$$= \frac{c^2x\sqrt{c + a^2cx^2} \tan^{-1}(ax)^3}{2a^2} + \frac{1}{4}c^2x^3\sqrt{c + a^2cx^2} \tan^{-1}(ax)^3 + \frac{1}{6}a^2c^2x^5\sqrt{c + a^2}$$

$$= -\frac{3c^2\sqrt{c + a^2cx^2} \tan^{-1}(ax)^2}{2a^3} - \frac{c^2x^2\sqrt{c + a^2cx^2} \tan^{-1}(ax)^2}{4a} - \frac{1}{10}ac^2x^4\sqrt{c + a^2}$$

$$= \frac{c^2x\sqrt{c + a^2cx^2} \tan^{-1}(ax)}{4a^2} + \frac{1}{20}c^2x^3\sqrt{c + a^2cx^2} \tan^{-1}(ax) + \frac{1}{56}a^2c^2x^5\sqrt{c + a}$$

$$= -\frac{c^2\sqrt{c + a^2cx^2}}{4a^3} - \frac{c^2x\sqrt{c + a^2cx^2} \tan^{-1}(ax)}{6a^2} - \frac{27}{560}c^2x^3\sqrt{c + a^2cx^2} \tan^{-1}(ax)$$

$$= \frac{c^2\sqrt{c + a^2cx^2}}{6a^3} + \frac{491c^2x\sqrt{c + a^2cx^2} \tan^{-1}(ax)}{1344a^2} - \frac{27}{560}c^2x^3\sqrt{c + a^2cx^2} \tan^{-1}(a$$

$$= -\frac{2239c^2\sqrt{c + a^2cx^2}}{6720a^3} - \frac{c\left(c + a^2cx^2\right)^{3/2}}{210a^3} - \frac{\left(c + a^2cx^2\right)^{5/2}}{280a^3} + \frac{491c^2x\sqrt{c + a^2cx^2}}{1344a^2}$$

$$= -\frac{2899c^2\sqrt{c + a^2cx^2}}{6720a^3} + \frac{47c\left(c + a^2cx^2\right)^{3/2}}{1680a^3} - \frac{\left(c + a^2cx^2\right)^{5/2}}{280a^3} + \frac{491c^2x\sqrt{c + a^2c}}{1344}$$

$$= -\frac{2899c^2\sqrt{c + a^2cx^2}}{6720a^3} + \frac{47c\left(c + a^2cx^2\right)^{3/2}}{1680a^3} - \frac{\left(c + a^2cx^2\right)^{5/2}}{280a^3} + \frac{491c^2x\sqrt{c + a^2c}}{1344}$$

$$= -\frac{2899c^2\sqrt{c + a^2cx^2}}{6720a^3} + \frac{47c\left(c + a^2cx^2\right)^{3/2}}{1680a^3} - \frac{\left(c + a^2cx^2\right)^{5/2}}{280a^3} + \frac{491c^2x\sqrt{c + a^2c}}{1344}$$

$$= -\frac{2899c^2\sqrt{c + a^2cx^2}}{6720a^3} + \frac{47c\left(c + a^2cx^2\right)^{3/2}}{1680a^3} - \frac{\left(c + a^2cx^2\right)^{5/2}}{280a^3} + \frac{491c^2x\sqrt{c + a^2c}}{1344}$$

$$= -\frac{2899c^2\sqrt{c + a^2cx^2}}{6720a^3} + \frac{47c\left(c + a^2cx^2\right)^{3/2}}{1680a^3} - \frac{\left(c + a^2cx^2\right)^{5/2}}{280a^3} + \frac{491c^2x\sqrt{c + a^2c}}{1344}$$

Mathematica [B] time = 24.43, size = 6517, normalized size = 6.40

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

[Out] Result too large to show

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^6 + 2\,a^2c^2x^4 + c^2x^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*sqrt(a^2*c*x^2 + c)*arctan
(a*x)^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.05, size = 566, normalized size = 0.56

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(1680\arctan\left(ax\right)^3x^7a^7 - 720\arctan\left(ax\right)^2x^6a^6 + 4760\arctan\left(ax\right)^3x^5a^5 + 240\arctan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x)
```

```
[Out] 1/13440*c^2/a^3*(c*(a*x-I)*(I+a*x))^(1/2)*(1680*arctan(a*x)^3*x^7*a^7-720*a
rctan(a*x)^2*x^6*a^6+4760*arctan(a*x)^3*x^5*a^5+240*arctan(a*x)*x^5*a^5-199
2*arctan(a*x)^2*x^4*a^4+4130*arctan(a*x)^3*a^3*x^3-48*a^4*x^4+696*arctan(a*
x)*x^3*a^3-1474*arctan(a*x)^2*x^2*a^2+525*arctan(a*x)^3*x*a-168*a^2*x^2+430
*arctan(a*x)*x*a+1373*arctan(a*x)^2-94)-1/13440*c^2*(c*(a*x-I)*(I+a*x))^(1/
2)*(525*arctan(a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-1575*I*arctan(a*x
)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-525*arctan(a*x)^3*ln(1+I*(1+I*
a*x)/(a^2*x^2+1)^(1/2))+1575*I*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^
2+1)^(1/2))+3176*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3150*arcta
n(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3150*I*polylog(4,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))-3176*arctan(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3
150*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-3150*I*polylog(4,
-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+3176*I*dilog(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2
))-3176*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^3/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2 + c\right)^{\frac{5}{2}} x^2 \arctan\left(ax\right)^3\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^2*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2 \left(c \left(a^2x^2 + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^3(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(5/2)*atan(a*x)**3,x)
```

```
[Out] Integral(x**2*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3, x)
```

3.430 $\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=561

$$-\frac{37c^{5/2}\tanh^{-1}\left(\frac{a\sqrt{c}x}{\sqrt{a^2cx^2+c}}\right)}{120a^2}-\frac{15ic^3\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{56a^2\sqrt{a^2cx^2+c}}+\frac{15ic^3\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}}\right.}{56a^2\sqrt{a^2cx^2+c}}$$

```
[Out] -1/140*c*x*(a^2*c*x^2+c)^(3/2)/a+5/84*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)/a^2
+1/35*(a^2*c*x^2+c)^(5/2)*arctan(a*x)/a^2-5/56*c*x*(a^2*c*x^2+c)^(3/2)*arct
an(a*x)^2/a-1/14*x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^2/a+1/7*(a^2*c*x^2+c)^(7
/2)*arctan(a*x)^3/a^2/c-37/120*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1
/2))/a^2+15/56*I*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2
*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-15/56*I*c^3*arctan(a*x)*polylog(2,-I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+15/5
6*I*c^3*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1
/2)/a^2/(a^2*c*x^2+c)^(1/2)+15/56*c^3*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-15/56*c^3*polylog(3,I*(1+I*a
*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)-17/420*c^2
*x*(a^2*c*x^2+c)^(1/2)/a+15/56*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/a^2-15/1
12*c^2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a
```

Rubi [A] time = 0.53, antiderivative size = 561, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 11, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4930, 4880, 4890, 4888, 4181, 2531, 2282, 6589, 217, 206, 195}

$$-\frac{15ic^3\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{56a^2\sqrt{a^2cx^2+c}}+\frac{15ic^3\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{56a^2\sqrt{a^2cx^2+c}}+15c$$

Antiderivative was successfully verified.

```
[In] Int[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

```
[Out] (-17*c^2*x*Sqrt[c + a^2*c*x^2])/(420*a) - (c*x*(c + a^2*c*x^2)^(3/2))/(140*
a) + (15*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(56*a^2) + (5*c*(c + a^2*c*x^
2)^(3/2)*ArcTan[a*x])/(84*a^2) + ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x])/(35*a^
2) - (15*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(112*a) - (5*c*x*(c + a^2
*c*x^2)^(3/2)*ArcTan[a*x]^2)/(56*a) - (x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^
2)/(14*a) + (((15*I)/56)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*Ar
cTan[a*x]^2)/(a^2*Sqrt[c + a^2*c*x^2]) + ((c + a^2*c*x^2)^(7/2)*ArcTan[a*x]
^3)/(7*a^2*c) - (37*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/(12
0*a^2) - (((15*I)/56)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(
I*ArcTan[a*x])])/(a^2*Sqrt[c + a^2*c*x^2]) + (((15*I)/56)*c^3*Sqrt[1 + a^2*
x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^2*Sqrt[c + a^2*c*x^2])
 + (15*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(56*a^2*Sq
rt[c + a^2*c*x^2]) - (15*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x
])])/(56*a^2*Sqrt[c + a^2*c*x^2])
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3\,dx = \frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)^3}{7a^2c} - \frac{3\int\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2\,dx}{7a}$$

$$= \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}{35a^2} - \frac{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{14a} + \frac{\left(c+a^2cx^2\right)^{7/2}\tan}{7a^2c}$$

$$= -\frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}{84a^2} + \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax}{35a^2}$$

$$= -\frac{17c^2x\sqrt{c+a^2cx^2}}{420a} - \frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{15c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{56a^2} + \frac{5c(}{}$$

$$= -\frac{17c^2x\sqrt{c+a^2cx^2}}{420a} - \frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{15c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{56a^2} + \frac{5c(}{}$$

$$= -\frac{17c^2x\sqrt{c+a^2cx^2}}{420a} - \frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{15c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{56a^2} + \frac{5c(}{}$$

$$= -\frac{17c^2x\sqrt{c+a^2cx^2}}{420a} - \frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{15c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{56a^2} + \frac{5c(}{}$$

$$= -\frac{17c^2x\sqrt{c+a^2cx^2}}{420a} - \frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{15c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{56a^2} + \frac{5c(}{}$$

$$= -\frac{17c^2x\sqrt{c+a^2cx^2}}{420a} - \frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{15c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{56a^2} + \frac{5c(}{}$$

$$= -\frac{17c^2x\sqrt{c+a^2cx^2}}{420a} - \frac{cx\left(c+a^2cx^2\right)^{3/2}}{140a} + \frac{15c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{56a^2} + \frac{5c(}{}$$

Mathematica [A] time = 6.09, size = 718, normalized size = 1.28

$$\frac{c^2\sqrt{a^2cx^2+c}\left(64\left(-259\tanh^{-1}\left(\frac{ax}{\sqrt{a^2x^2+1}}\right)-309i\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+309i\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

```
[Out] (c^2*Sqrt[c + a^2*c*x^2]*(64*((309*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]
^2 - 259*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - (309*I)*ArcTan[a*x]*PolyLog[2,
```

```
(-I)*E^(I*ArcTan[a*x])] + (309*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x]
)] + 309*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 309*PolyLog[3, I*E^(I*ArcTan[
a*x])]) + 53760*(I*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 - ArcTanh[(a*x)/
Sqrt[1 + a^2*x^2]] - I*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + I*A
rcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + PolyLog[3, (-I)*E^(I*ArcTan[a*
x])] - PolyLog[3, I*E^(I*ArcTan[a*x])]) + 4480*(1 + a^2*x^2)^(3/2)*ArcTan[a
*x]*(6 + 4*ArcTan[a*x]^2 + 6*Cos[2*ArcTan[a*x]] - 3*ArcTan[a*x]*Sin[2*ArcTa
n[a*x]]) - 112*(48*((11*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 - 10*Arc
Tanh[(a*x)/Sqrt[1 + a^2*x^2]] - (11*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*Arc
Tan[a*x])] + (11*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] + 11*PolyLo
g[3, (-I)*E^(I*ArcTan[a*x])] - 11*PolyLog[3, I*E^(I*ArcTan[a*x])]) + (1 + a
^2*x^2)^(5/2)*((48*a*x)/(1 + a^2*x^2)^2 + 32*ArcTan[a*x]^3*(-1 + 5*Cos[2*Ar
cTan[a*x]]) + 6*ArcTan[a*x]*(25 + 36*Cos[2*ArcTan[a*x]] + 11*Cos[4*ArcTan[a
*x]]) + ArcTan[a*x]^2*(6*Sin[2*ArcTan[a*x]] - 33*Sin[4*ArcTan[a*x]]))) + (1
 + a^2*x^2)^(7/2)*(64*ArcTan[a*x]^3*(57 - 28*Cos[2*ArcTan[a*x]] + 35*Cos[4*
ArcTan[a*x]]) + (8*ArcTan[a*x]*(647 + 764*Cos[2*ArcTan[a*x]] + 309*Cos[4*Ar
cTan[a*x]]))/(1 + a^2*x^2) + 4*(101*Sin[2*ArcTan[a*x]] + 88*Sin[4*ArcTan[a*
x]] + 25*Sin[6*ArcTan[a*x]]) - 3*ArcTan[a*x]^2*(211*Sin[2*ArcTan[a*x]] - 60
*Sin[4*ArcTan[a*x]] + 103*Sin[6*ArcTan[a*x]]))))/(53760*a^2*Sqrt[1 + a^2*x^
2])
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^5 + 2\,a^2c^2x^3 + c^2x\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*sqrt(a^2*c*x^2 + c)*arctan(a
*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.37, size = 477, normalized size = 0.85

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\,\left(240\arctan\left(ax\right)^3x^6a^6 - 120\arctan\left(ax\right)^2x^5a^5 + 720\arctan\left(ax\right)^3x^4a^4 + 48\arctan\left(ax\right)x^4a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x)
```

```
[Out] 1/1680*c^2/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*(240*arctan(a*x)^3*x^6*a^6-120*arc
tan(a*x)^2*x^5*a^5+720*arctan(a*x)^3*x^4*a^4+48*arctan(a*x)*x^4*a^4-390*arc
tan(a*x)^2*x^3*a^3+720*arctan(a*x)^3*x^2*a^2-12*a^3*x^3+196*arctan(a*x)*a^2
*x^2-495*arctan(a*x)^2*x*a+240*arctan(a*x)^3-80*a*x+598*arctan(a*x))+5/112*
c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(I*arctan(a*x)^3+6*I*arctan(a*x)*polylog(2,I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))-6*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^2/(a^2*x^2+1)^(1/2)+5/1
12*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(-I*arctan(a*x)^3+3*arctan(a*x)^2*ln(1+I*(
```

```
1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2
+1)^(1/2))+6*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/a^2/(a^2*x^2+1)^(1/
2)+37/60*I*c^2/a^2*(c*(a*x-I)*(I+a*x))^(1/2)*arctan((1+I*a*x)/(a^2*x^2+1)^(
1/2))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2+c\right)^{\frac{5}{2}} x \arctan\left(ax\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^3*(c + a^2*c*x^2)^(5/2),x)
[Out] int(x*atan(a*x)^3*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^3\left(ax\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)*atan(a*x)**3,x)
[Out] Integral(x*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3, x)
```

3.431 $\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3\,dx$

Optimal. Leaf size=870

$$-\frac{5i\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3c^3}{8a\sqrt{a^2cx^2+c}}-\frac{259i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)c^3}{60a\sqrt{a^2cx^2+c}}+\frac{15i\sqrt{a^2x^2+1}\,\tan^{-1}(}{16a\sqrt{}}$$

```
[Out] -1/60*c*(a^2*c*x^2+c)^(3/2)/a+1/20*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)-5/24
*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2/a-1/10*(a^2*c*x^2+c)^(5/2)*arctan(a*x)
^2/a+5/24*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3+1/6*x*(a^2*c*x^2+c)^(5/2)*a
rctan(a*x)^3-259/120*I*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^
2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-15/8*I*c^3*polylog(4,-I*(1+I*a*x)/(a^2
*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-15/16*I*c^3*arctan(a
*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x
^2+c)^(1/2)+15/16*I*c^3*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+259/120*I*c^3*polylog(2,-I*(1+
I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-5/8*I
*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a/
(a^2*c*x^2+c)^(1/2)-15/8*c^3*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+15/8*c^3*arctan(a*x)*polylo
g(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-
259/60*I*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1
)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+15/8*I*c^3*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-17/60*c^2*(a^2*c*x^2+c)^(1/2
)/a+17/60*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-15/16*c^2*arctan(a*x)^2*(a^
2*c*x^2+c)^(1/2)/a+5/16*c^2*x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.79, antiderivative size = 870, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4880, 4890, 4888, 4181, 2531, 6609, 2282, 6589, 4886, 4878}

$$-\frac{5i\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3c^3}{8a\sqrt{a^2cx^2+c}}-\frac{259i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)c^3}{60a\sqrt{a^2cx^2+c}}+\frac{15i\sqrt{a^2x^2+1}\,\tan^{-1}(}{16}$$

Antiderivative was successfully verified.

```
[In] Int[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

```
[Out] (-17*c^2*Sqrt[c + a^2*c*x^2])/(60*a) - (c*(c + a^2*c*x^2)^(3/2))/(60*a) + (
17*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/60 + (c*x*(c + a^2*c*x^2)^(3/2)*A
rcTan[a*x])/20 - (15*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(16*a) - (5*c*(
c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/(24*a) - ((c + a^2*c*x^2)^(5/2)*ArcTan[
a*x]^2)/(10*a) + (5*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/16 + (5*c*x*(c
 + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/24 + (x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x
]^3)/6 - (((5*I)/8)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[
a*x]^3)/(a*Sqrt[c + a^2*c*x^2]) - (((259*I)/60)*c^3*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) + (
((15*I)/16)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan
[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - (((15*I)/16)*c^3*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + (((259*
I)/120)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*
a*x]])/(a*Sqrt[c + a^2*c*x^2]) - (((259*I)/120)*c^3*Sqrt[1 + a^2*x^2]*PolyL
og[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a*Sqrt[c + a^2*c*x^2]) - (15*c
^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(8*a*S
qrt[c + a^2*c*x^2]) + (15*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^
(I*ArcTan[a*x])])/(8*a*Sqrt[c + a^2*c*x^2]) - (((15*I)/8)*c^3*Sqrt[1 + a^2*
```

```
x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + (((15*I)
/8)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*
c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
```

```
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] && !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3\,dx = -\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}{10a}+\frac{1}{6}x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3+\frac{1}{5}c\int \left(c+a^2cx^2\right)^{3}$$

$$= -\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{1}{20}cx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)-\frac{5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}{24a}$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

$$= -\frac{17c^2\sqrt{c+a^2cx^2}}{60a}-\frac{c\left(c+a^2cx^2\right)^{3/2}}{60a}+\frac{17}{60}c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax)+\frac{1}{20}cx\left(c+\right.$$

Mathematica [B] time = 18.95, size = 4281, normalized size = 4.92

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3,x]
```

```
[Out] ((-1/2*I)*c^2*Sqrt[c*(1 + a^2*x^2)]*(12*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*
x] - (3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + I*a*x*Sqrt[1 + a^2*x^2]*ArcTan
[a*x]^3 + 2*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3 - 3*(2 + ArcTan[a*x]^2)
*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + 3*(2 + ArcTan[a*x]^2)*PolyLog[2, I*E^
(I*ArcTan[a*x])] - (6*I)*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + (
6*I)*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])] + 6*PolyLog[4, (-I)*E^(I*A
rcTan[a*x])] - 6*PolyLog[4, I*E^(I*ArcTan[a*x])]))/(a*Sqrt[1 + a^2*x^2]) +
(2*c^2*((Sqrt[c*(1 + a^2*x^2)]*(-1 + ArcTan[a*x]^2))/(4*Sqrt[1 + a^2*x^2])
+ (Sqrt[c*(1 + a^2*x^2)]*(-(ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log
[1 + I*E^(I*ArcTan[a*x])])) - I*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyL
og[2, I*E^(I*ArcTan[a*x])])))/(2*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)
]*(-1/8*(Pi^3*Log[Cot[(Pi/2 - ArcTan[a*x])/2]]) - (3*Pi^2*((Pi/2 - ArcTan[a
*x])*(Log[1 - E^(I*(Pi/2 - ArcTan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x
]))]) + I*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2
- ArcTan[a*x]))])))/4 + (3*Pi*((Pi/2 - ArcTan[a*x])^2*(Log[1 - E^(I*(Pi/2 -
 ArcTan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + (2*I)*(Pi/2 - ArcT
an[a*x])*(PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 -
 ArcTan[a*x]))]) + 2*(-PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))] + PolyLog[3,
 E^(I*(Pi/2 - ArcTan[a*x]))])))/2 - 8*((I/64)*(Pi/2 - ArcTan[a*x])^4 + (I/4
)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^4 - ((Pi/2 - ArcTan[a*x])^3*Log[1 + E^
(I*(Pi/2 - ArcTan[a*x]))])/8 - (Pi^3*(I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)
- Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/8 - (Pi/2 + (-1/2
*Pi + ArcTan[a*x])/2)^3*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)
)] + ((3*I)/8)*(Pi/2 - ArcTan[a*x])^2*PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x])
)] + (3*Pi^2*((I/2)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2 - (Pi/2 + (-1/2*Pi
 + ArcTan[a*x])/2)*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] +
(I/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/4 + ((3*I
)/2)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/
2*Pi + ArcTan[a*x])/2))] - (3*(Pi/2 - ArcTan[a*x])*PolyLog[3, -E^(I*(Pi/2 -
 ArcTan[a*x]))])/4 - (3*Pi*((I/3)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3 - (P
i/2 + (-1/2*Pi + ArcTan[a*x])/2)^2*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcT
an[a*x])/2))] + I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[2, -E^((2*I)*(
Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi
 + ArcTan[a*x])/2))]/2))/2 - (3*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[
3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4,
 -E^(I*(Pi/2 - ArcTan[a*x]))] - ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/
2*Pi + ArcTan[a*x])/2))])))/(8*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*
ArcTan[a*x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/
2])^4) + (Sqrt[c*(1 + a^2*x^2)]*(2*ArcTan[a*x] - ArcTan[a*x]^2 - ArcTan[a*x
]^3))/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^2) -
(Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^
2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^3) - (Sqrt[c*(1 + a^2*x^2)]*Ar
cTan[a*x]^3)/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2]
)^4) + (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 +
 a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x
^2)]*(-2*ArcTan[a*x] - ArcTan[a*x]^2 + ArcTan[a*x]^3))/(16*Sqrt[1 + a^2*x^2
]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^2) + (Sqrt[c*(1 + a^2*x^2)]*(Si
n[ArcTan[a*x]/2] - ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*
(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])) + (Sqrt[c*(1 + a^2*x^2)]*(-Sin[A
rcTan[a*x]/2] + ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Co
s[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2]))))/a + (c^2*((Sqrt[c*(1 + a^2*x^2)]*
(50 - 19*ArcTan[a*x]^2))/(240*Sqrt[1 + a^2*x^2]) + (19*Sqrt[c*(1 + a^2*x^2)
```

```
]*(ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]
) + I*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2, I*E^(I*ArcTan[a*x])]
)))/(120*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*((Pi^3*Log[Cot[(Pi/2 -
 ArcTan[a*x])/2]])/8 + (3*Pi^2*((Pi/2 - ArcTan[a*x])*(Log[1 - E^(I*(Pi/2 -
ArcTan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + I*(PolyLog[2, -E^(I
*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTan[a*x]))])))/4 - (3*
Pi*((Pi/2 - ArcTan[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcTan[a*x]))] - Log[1 + E
^(I*(Pi/2 - ArcTan[a*x]))]) + (2*I)*(Pi/2 - ArcTan[a*x])*(PolyLog[2, -E^(I*
(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTan[a*x]))]) + 2*(-Poly
Log[3, -E^(I*(Pi/2 - ArcTan[a*x]))] + PolyLog[3, E^(I*(Pi/2 - ArcTan[a*x]))
])))/2 + 8*((I/64)*(Pi/2 - ArcTan[a*x])^4 + (I/4)*(Pi/2 + (-1/2*Pi + ArcTan
[a*x])/2)^4 - ((Pi/2 - ArcTan[a*x])^3*Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))])/
8 - (Pi^3*(I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2) - Log[1 + E^((2*I)*(Pi/2 +
(-1/2*Pi + ArcTan[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3*Log
[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + ((3*I)/8)*(Pi/2 - ArcT
an[a*x])^2*PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] + (3*Pi^2*((I/2)*(Pi/2 +
 (-1/2*Pi + ArcTan[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*Log[1 +
E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + (I/2)*PolyLog[2, -E^((2*I)*
(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/4 + ((3*I)/2)*(Pi/2 + (-1/2*Pi + Arc
Tan[a*x])/2)^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] -
(3*(Pi/2 - ArcTan[a*x])*PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))])/4 - (3*Pi*
((I/3)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3 - (Pi/2 + (-1/2*Pi + ArcTan[a*x
])/2)^2*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + I*(Pi/2 + (
-1/2*Pi + ArcTan[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*
x])/2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]/2))/2
- (3*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*
Pi + ArcTan[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^(I*(Pi/2 - ArcTan[a*x])
)] - ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))])))
/(16*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^3)/(48*Sqrt[1
+ a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^6) + (Sqrt[c*(1 + a^2*
x^2)]*(ArcTan[a*x] - ArcTan[a*x]^2 - 5*ArcTan[a*x]^3))/(80*Sqrt[1 + a^2*x^2
]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^4) + (Sqrt[c*(1 + a^2*x^2)]*(-2
 - 52*ArcTan[a*x] + 26*ArcTan[a*x]^2 + 15*ArcTan[a*x]^3))/(480*Sqrt[1 + a^2
*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^2) - (Sqrt[c*(1 + a^2*x^2)]
*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(40*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2
] - Sin[ArcTan[a*x]/2])^5) - (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^3)/(48*Sqrt
[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^6) + (Sqrt[c*(1 + a
^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(40*Sqrt[1 + a^2*x^2]*(Cos[ArcTa
n[a*x]/2] + Sin[ArcTan[a*x]/2])^5) + (Sqrt[c*(1 + a^2*x^2)]*(-ArcTan[a*x] -
 ArcTan[a*x]^2 + 5*ArcTan[a*x]^3))/(80*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2
] + Sin[ArcTan[a*x]/2])^4) + (Sqrt[c*(1 + a^2*x^2)]*(-2 + 52*ArcTan[a*x] +
26*ArcTan[a*x]^2 - 15*ArcTan[a*x]^3))/(480*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*
x]/2] + Sin[ArcTan[a*x]/2])^2) + (Sqrt[c*(1 + a^2*x^2)]*(50*Sin[ArcTan[a*x]
/2] - 19*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(240*Sqrt[1 + a^2*x^2]*(Cos[Arc
Tan[a*x]/2] - Sin[ArcTan[a*x]/2])) + (Sqrt[c*(1 + a^2*x^2)]*(Sin[ArcTan[a*x
]/2] - 13*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(120*Sqrt[1 + a^2*x^2]*(Cos[Ar
cTan[a*x]/2] + Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]*(-Sin[ArcTan
[a*x]/2] + 13*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(120*Sqrt[1 + a^2*x^2]*(Co
s[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]*(-50*Sin
[ArcTan[a*x]/2] + 19*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(240*Sqrt[1 + a^2*x
^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2]))))/a
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.97, size = 518, normalized size = 0.60

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\,\left(40\arctan(ax)^3x^5a^5-24\arctan(ax)^2x^4a^4+130\arctan(ax)^3a^3x^3+12\arctan(ax)\,x^3\right.}{240a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x)
```

```
[Out] 1/240*c^2/a*(c*(a*x-I)*(I+a*x))^(1/2)*(40*arctan(a*x)^3*x^5*a^5-24*arctan(a
*x)^2*x^4*a^4+130*arctan(a*x)^3*a^3*x^3+12*arctan(a*x)*x^3*a^3-98*arctan(a*
x)^2*x^2*a^2+165*arctan(a*x)^3*x*a-4*a^2*x^2+80*arctan(a*x)*x*a-299*arctan(
a*x)^2-72)+1/240*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(75*arctan(a*x)^3*ln(1-I*(1+
I*a*x)/(a^2*x^2+1)^(1/2))-225*I*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^
2+1)^(1/2))-75*arctan(a*x)^3*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+225*I*arct
an(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+518*arctan(a*x)*ln(1-I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))+450*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2
+1)^(1/2))+450*I*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-518*arctan(a*x)*l
n(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-450*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))-450*I*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+518*I*dil
og(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-518*I*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(
1/2)))/a/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan(ax)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}(a\,x)^3\,\left(c\,a^2\,x^2+c\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^3*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\mathrm{atan}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**3,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3, x)
```

3.432 $\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}{x}\,dx$

Optimal. Leaf size=845

$$\frac{149i\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2c^3}{20\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)c^3}{\sqrt{a^2cx^2+c}}+\frac{3i\sqrt{a^2x^2+1}\,\text{ta}}{}$$

```
[Out] 1/10*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)-3/20*a*c*x*(a^2*c*x^2+c)^(3/2)*arcta
n(a*x)^2+1/3*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3+1/5*(a^2*c*x^2+c)^(5/2)*ar
ctan(a*x)^3-3/2*c^(5/2)*arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))-149/20*I*c
^3*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/
(a^2*c*x^2+c)^(1/2)-2*c^3*arctan(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2)
)*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*I*c^3*polylog(4,(1+I*a*x)/(a^2*x^
2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+149/20*I*c^3*arctan(a*x)*
polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1
/2)+3*I*c^3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+
1)^(1/2)/(a^2*c*x^2+c)^(1/2)+149/20*I*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2
))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*c^3*arctan(a*x)*po
lylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
+149/20*c^3*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)-149/20*c^3*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x
^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*c^3*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*
x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*c^3*polylog(4,-(1+I
*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*c^3*arct
an(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x
^2+c)^(1/2)-1/20*a*c^2*x*(a^2*c*x^2+c)^(1/2)+29/20*c^2*arctan(a*x)*(a^2*c*x
^2+c)^(1/2)-29/40*a*c^2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)+c^2*arctan(a*x)
^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.78, antiderivative size = 845, normalized size of antiderivative = 1.00, number of steps used = 54, number of rules used = 16, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4950, 4958, 4956, 4183, 2531, 6609, 2282, 6589, 4930, 4890, 4888, 4181, 4880, 217, 206, 195}

$$\frac{149i\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2c^3}{20\sqrt{a^2cx^2+c}}-\frac{2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)c^3}{\sqrt{a^2cx^2+c}}+\frac{3i\sqrt{a^2x^2+1}\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x,x]
```

```
[Out] -(a*c^2*x*Sqrt[c + a^2*c*x^2])/20 + (29*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
)/20 + (c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])/10 - (29*a*c^2*x*Sqrt[c + a^2*
c*x^2]*ArcTan[a*x]^2)/40 - (3*a*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2)/20
 + (((149*I)/20)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x
]^2)/Sqrt[c + a^2*c*x^2] + c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3 + (c*(c +
a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/3 + ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/5
 - (2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[
c + a^2*c*x^2] - (3*c^(5/2)*ArcTanh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]])/2 +
 ((3*I)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])
/Sqrt[c + a^2*c*x^2] - (((149*I)/20)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Poly
Log[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (((149*I)/20)*c^3*Sqr
t[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*
x^2] - ((3*I)*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, E^(I*ArcTan[a*
x])])/Sqrt[c + a^2*c*x^2] - (6*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3,
 -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (149*c^3*Sqrt[1 + a^2*x^2]*Poly
Log[3, (-I)*E^(I*ArcTan[a*x])])/(20*Sqrt[c + a^2*c*x^2]) - (149*c^3*Sqrt[1
+ a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(20*Sqrt[c + a^2*c*x^2]) + (6*c
```

```
^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^
2*c*x^2] - ((6*I)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[4, -E^(I*ArcTan[a*x])])/Sqr
t[c + a^2*c*x^2] + ((6*I)*c^3*Sqrt[1 + a^2*x^2]*PolyLog[4, E^(I*ArcTan[a*x]
)])/Sqrt[c + a^2*c*x^2]
```

Rule 195

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^p)/(n*p
 + 1), x] + Dist[(a*n*p)/(n*p + 1), Int[(a + b*x^n)^(p - 1), x], x] /; Free
Q[{a, b}, x] && IGtQ[n, 0] && GtQ[p, 0] && (IntegerQ[2*p] || (EqQ[n, 2] &&
IntegerQ[4*p]) || (EqQ[n, 2] && IntegerQ[3*p]) || LtQ[Denominator[p + 1/n],
 Denominator[p]])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
```

```
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}{x}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x}\,dx + \left(a^2c\right)\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3\,dx$$

$$= \frac{1}{5}\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3 - \frac{1}{5}(3ac)\int \left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2\,dx + c^2\int \frac{\sqrt{c}}{}$$

$$= \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax) - \frac{3}{20}acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2 + \frac{1}{3}c\left(c+a^2cx^2\right.$$

$$= -\frac{1}{20}ac^2x\sqrt{c+a^2cx^2} + \frac{29}{20}c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

$$= -\frac{1}{20}ac^2x\sqrt{c+a^2cx^2} + \frac{29}{20}c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

$$= -\frac{1}{20}ac^2x\sqrt{c+a^2cx^2} + \frac{29}{20}c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

$$= -\frac{1}{20}ac^2x\sqrt{c+a^2cx^2} + \frac{29}{20}c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

$$= -\frac{1}{20}ac^2x\sqrt{c+a^2cx^2} + \frac{29}{20}c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

$$= -\frac{1}{20}ac^2x\sqrt{c+a^2cx^2} + \frac{29}{20}c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

$$= -\frac{1}{20}ac^2x\sqrt{c+a^2cx^2} + \frac{29}{20}c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax) + \frac{1}{10}c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(a$$

Mathematica [A] time = 7.17, size = 1066, normalized size = 1.26

$$\frac{1}{8}\sqrt{c\left(a^2x^2+1\right)}\left(\frac{2i\tan^{-1}(ax)^4}{\sqrt{a^2x^2+1}} + \frac{8\log\left(1-e^{-i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}} - \frac{8\log\left(1+e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}} + 8\tan^{-1}(\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x,x]
```

```
[Out] (c^2*Sqrt[c*(1 + a^2*x^2)]*(((-I)*Pi^4)/Sqrt[1 + a^2*x^2] + 8*ArcTan[a*x]^3
 + ((2*I)*ArcTan[a*x]^4)/Sqrt[1 + a^2*x^2] + (8*ArcTan[a*x]^3*Log[1 - E^((-
I)*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (24*ArcTan[a*x]^2*Log[1 - I*E^(I*ArcT
an[a*x])])/Sqrt[1 + a^2*x^2] + (24*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x]
)])/Sqrt[1 + a^2*x^2] - (8*ArcTan[a*x]^3*Log[1 + E^(I*ArcTan[a*x])])/Sqrt[1
 + a^2*x^2] + ((24*I)*ArcTan[a*x]^2*PolyLog[2, E^((-I)*ArcTan[a*x])])/Sqrt[
1 + a^2*x^2] + ((24*I)*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[1
 + a^2*x^2] - ((48*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[
```

```
1 + a^2*x^2] + ((48*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[1
+ a^2*x^2] + (48*ArcTan[a*x]*PolyLog[3, E^((-I)*ArcTan[a*x])])/Sqrt[1 + a^2
*x^2] - (48*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] +
 (48*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (48*PolyLog[3,
 I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((48*I)*PolyLog[4, E^((-I)*ArcTa
n[a*x])])/Sqrt[1 + a^2*x^2] - ((48*I)*PolyLog[4, -E^(I*ArcTan[a*x])])/Sqrt[
1 + a^2*x^2]))/8 + 2*c^2*((Sqrt[c*(1 + a^2*x^2)]*(I*ArcTan[E^(I*ArcTan[a*x]
)]*ArcTan[a*x]^2 - ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - I*ArcTan[a*x]*PolyLog
[2, (-I)*E^(I*ArcTan[a*x])] + I*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])]
 + PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - PolyLog[3, I*E^(I*ArcTan[a*x])]))/S
qrt[1 + a^2*x^2] + ((1 + a^2*x^2)*Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]*(6 + 4*
ArcTan[a*x]^2 + 6*Cos[2*ArcTan[a*x]] - 3*ArcTan[a*x]*Sin[2*ArcTan[a*x]]))/1
2) + c^2*((Sqrt[c*(1 + a^2*x^2)]*((-11*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[
a*x]^2 + 10*ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] + (11*I)*ArcTan[a*x]*PolyLog[2
, (-I)*E^(I*ArcTan[a*x])] - (11*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x
])] - 11*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 11*PolyLog[3, I*E^(I*ArcTan[a
*x])]))/(20*Sqrt[1 + a^2*x^2]) - ((1 + a^2*x^2)^2*Sqrt[c*(1 + a^2*x^2)]*(15
0*ArcTan[a*x] - 32*ArcTan[a*x]^3 + 8*ArcTan[a*x]*(27 + 20*ArcTan[a*x]^2)*Co
s[2*ArcTan[a*x]] + 66*ArcTan[a*x]*Cos[4*ArcTan[a*x]] + 12*Sin[2*ArcTan[a*x]
] + 6*ArcTan[a*x]^2*Sin[2*ArcTan[a*x]] + 6*Sin[4*ArcTan[a*x]] - 33*ArcTan[a
*x]^2*Sin[4*ArcTan[a*x]]))/960)
```

fricas [F] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^3}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^3/x, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.27, size = 562, normalized size = 0.67

$$\frac{c^2\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(24\arctan\left(ax\right)^3 x^4a^4 - 18\arctan\left(ax\right)^2 x^3a^3 + 88\arctan\left(ax\right)^3 x^2a^2 + 12\arctan\left(ax\right) a^2x\right.}{120}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x,x)
```

```
[Out] 1/120*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(24*arctan(a*x)^3*x^4*a^4-18*arctan(a*x
)^2*x^3*a^3+88*arctan(a*x)^3*x^2*a^2+12*arctan(a*x)*a^2*x^2-105*arctan(a*x)
^2*x*a+184*arctan(a*x)^3-6*a*x+186*arctan(a*x))+1/40*(c*(a*x-I)*(I+a*x))^(1
/2)/(a^2*x^2+1)^(1/2)*(40*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-4
0*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-120*I*arctan(a*x)^2*polyl
```

```
og(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+120*I*arctan(a*x)^2*polylog(2,-(1+I*a*x)/
(a^2*x^2+1)^(1/2))+149*arctan(a*x)^2*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-14
9*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-298*I*arctan(a*x)*polyl
og(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+298*I*arctan(a*x)*polylog(2,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))+240*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))
-240*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+240*I*polylog(4,(1
+I*a*x)/(a^2*x^2+1)^(1/2))-240*I*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+12
0*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))+298*polylog(3,-I*(1+I*a*x)/(a^2*x^2
+1)^(1/2))-298*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^3\left(ax\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**3/x,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3/x, x)
```

3.433 $\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}{x^2}\,dx$

Optimal. Leaf size=1027

$$-\frac{15ia\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3c^3}{4\sqrt{a^2cx^2+c}}-\frac{11ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)c^3}{\sqrt{a^2cx^2+c}}-\frac{6a\sqrt{a^2x^2+1}\,\text{ta}}{}$$

```
[Out] -1/4*a*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^2+1/4*a^2*c*x*(a^2*c*x^2+c)^(3/2)*
arctan(a*x)^3-45/4*I*a*c^3*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x
^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-11/2*I*a*c^3*polylog(2,I*(1+I*a*x)^(1/2)/(1
-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a*c^3*arctan(a*x)^2*
arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-
11*I*a*c^3*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^
(1/2)/(a^2*c*x^2+c)^(1/2)-15/4*I*a*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*
arctan(a*x)^3*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*I*a*c^3*arctan(a*x)*p
olylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2
)+45/4*I*a*c^3*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)-6*I*a*c^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1
/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+11/2*I*a*c^3*polylog(2,-I*(1+I*a
*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a*c^3*po
lylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
-45/4*a*c^3*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+
1)^(1/2)/(a^2*c*x^2+c)^(1/2)+45/4*a*c^3*arctan(a*x)*polylog(3,I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*a*c^3*polylog(3,(
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+45/8*I*a*
c^3*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/
2)/(a^2*c*x^2+c)^(1/2)-45/8*I*a*c^3*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^
2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-1/4*a*c^2*(a^2*c*x^2+
c)^(1/2)+1/4*a^2*c^2*x*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-21/8*a*c^2*arctan(a*
x)^2*(a^2*c*x^2+c)^(1/2)-c^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x+7/8*a^2*c^
2*x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 2.11, antiderivative size = 1027, normalized size of antiderivative = 1.00, number of steps used = 56, number of rules used = 15, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4950, 4944, 4958, 4956, 4183, 2531, 2282, 6589, 4890, 4888, 4181, 6609, 4880, 4886, 4878}

$$-\frac{15ia\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3c^3}{4\sqrt{a^2cx^2+c}}-\frac{11ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\tan^{-1}\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)c^3}{\sqrt{a^2cx^2+c}}-\frac{6a\sqrt{a^2x^2+1}\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] -(a*c^2*Sqrt[c + a^2*c*x^2])/4 + (a^2*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]
)/4 - (21*a*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/8 - (a*c*(c + a^2*c*x^2)
^(3/2)*ArcTan[a*x]^2)/4 - (c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x + (7*a^
2*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/8 + (a^2*c*x*(c + a^2*c*x^2)^(3/
2)*ArcTan[a*x]^3)/4 - (((15*I)/4)*a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTa
n[a*x])]*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2] - ((11*I)*a*c^3*Sqrt[1 + a^2*x^
2]*ArcTan[a*x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
 - (6*a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqr
t[c + a^2*c*x^2] + ((6*I)*a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E
^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (((45*I)/8)*a*c^3*Sqrt[1 + a^2*x^2
]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (
((45*I)/8)*a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a
*x])])/Sqrt[c + a^2*c*x^2] - ((6*I)*a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Pol
```

```
yLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (((11*I)/2)*a*c^3*Sqrt[1
+ a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2
*c*x^2] - (((11*I)/2)*a*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x]
)/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (6*a*c^3*Sqrt[1 + a^2*x^2]*PolyLo
g[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (45*a*c^3*Sqrt[1 + a^2*x^2]
*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(4*Sqrt[c + a^2*c*x^2]) +
(45*a*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(4
*Sqrt[c + a^2*c*x^2]) + (6*a*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a
*x])])/Sqrt[c + a^2*c*x^2] - (((45*I)/4)*a*c^3*Sqrt[1 + a^2*x^2]*PolyLog[4,
 (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (((45*I)/4)*a*c^3*Sqrt[1 +
a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4878

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_.), x_Symbo
l] :> -Simp[(b*(d + e*x^2)^q)/(2*c*q*(2*q + 1)), x] + (Dist[(2*d*q)/(2*q +
1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTan[c*x]), x], x] + Simp[(x*(d + e*x^
2)^q*(a + b*ArcTan[c*x]))/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && Eq
Q[e, c^2*d] && GtQ[q, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
```

```
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}{x^2}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^2}\,dx + \left(a^2c\right)\int \left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3\,dx$$

$$= -\frac{1}{4}ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2 + \frac{1}{4}a^2cx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3 + c^2\int \frac{\sqrt{c+}}{}$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

$$= -\frac{1}{4}ac^2\sqrt{c+a^2cx^2} + \frac{1}{4}a^2c^2x\sqrt{c+a^2cx^2}\tan^{-1}(ax) - \frac{21}{8}ac^2\sqrt{c+a^2cx^2}\tan^{-1}(a$$

Mathematica [B] time = 15.55, size = 3267, normalized size = 3.18

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x^2,x]
```

```
[Out] ((-I)*a*c^2*Sqrt[c*(1 + a^2*x^2)]*(12*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]
 - (3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + I*a*x*Sqrt[1 + a^2*x^2]*ArcTan[a
*x]^3 + 2*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3 - 3*(2 + ArcTan[a*x]^2)*P
olyLog[2, (-I)*E^(I*ArcTan[a*x])] + 3*(2 + ArcTan[a*x]^2)*PolyLog[2, I*E^(I
```

```
*ArcTan[a*x])] - (6*I)*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + (6*
I)*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])] + 6*PolyLog[4, (-I)*E^(I*Arc
Tan[a*x])] - 6*PolyLog[4, I*E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] + (a*c^2
*Sqrt[c*(1 + a^2*x^2)]*Csc[ArcTan[a*x]/2]*(((-7*I)*a*Pi^4*x)/Sqrt[1 + a^2*x
^2] - ((8*I)*a*Pi^3*x*ArcTan[a*x])/Sqrt[1 + a^2*x^2] + ((24*I)*a*Pi^2*x*Arc
Tan[a*x]^2)/Sqrt[1 + a^2*x^2] - 64*ArcTan[a*x]^3 - ((32*I)*a*Pi*x*ArcTan[a*
x]^3)/Sqrt[1 + a^2*x^2] + ((16*I)*a*x*ArcTan[a*x]^4)/Sqrt[1 + a^2*x^2] + (4
8*a*Pi^2*x*ArcTan[a*x]*Log[1 - I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (9
6*a*Pi*x*ArcTan[a*x]^2*Log[1 - I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (8
*a*Pi^3*x*Log[1 + I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (64*a*x*ArcTan[
a*x]^3*Log[1 + I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (192*a*x*ArcTan[a*
x]^2*Log[1 - E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (8*a*Pi^3*x*Log[1 + I*
E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (48*a*Pi^2*x*ArcTan[a*x]*Log[1 + I*
E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (96*a*Pi*x*ArcTan[a*x]^2*Log[1 + I*
E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (64*a*x*ArcTan[a*x]^3*Log[1 + I*E^(
I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (192*a*x*ArcTan[a*x]^2*Log[1 + E^(I*Ar
cTan[a*x])])/Sqrt[1 + a^2*x^2] + (8*a*Pi^3*x*Log[Tan[(Pi + 2*ArcTan[a*x])/4
]])/Sqrt[1 + a^2*x^2] + ((192*I)*a*x*ArcTan[a*x]^2*PolyLog[2, (-I)/E^(I*Arc
Tan[a*x])])/Sqrt[1 + a^2*x^2] + ((48*I)*a*Pi*x*(Pi - 4*ArcTan[a*x])*PolyLog
[2, I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((384*I)*a*x*ArcTan[a*x]*Poly
Log[2, -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((48*I)*a*Pi^2*x*PolyLog[2,
 (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((192*I)*a*Pi*x*ArcTan[a*x]*P
olyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((192*I)*a*x*ArcTan[
a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((384*I)*a*x
*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (384*a*x*Ar
cTan[a*x]*PolyLog[3, (-I)/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (192*a*Pi
*x*PolyLog[3, I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (384*a*x*PolyLog[3,
 -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (192*a*Pi*x*PolyLog[3, (-I)*E^(I*
ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (384*a*x*ArcTan[a*x]*PolyLog[3, (-I)*E^(
I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (384*a*x*PolyLog[3, E^(I*ArcTan[a*x])]
)/Sqrt[1 + a^2*x^2] - ((384*I)*a*x*PolyLog[4, (-I)/E^(I*ArcTan[a*x])])/Sqrt
[1 + a^2*x^2] - ((384*I)*a*x*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a
^2*x^2])*Sec[ArcTan[a*x]/2])/(128*Sqrt[1 + a^2*x^2]) + a*c^2*((Sqrt[c*(1 +
a^2*x^2)]*(-1 + ArcTan[a*x]^2))/(4*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^
2)]*(-(ArcTan[a*x]*(Log[1 - I*E^(I*ArcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*
x])])) - I*(PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2, I*E^(I*ArcTan[a
*x])])))/(2*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*(-1/8*(Pi^3*Log[Cot
[(Pi/2 - ArcTan[a*x])/2]]) - (3*Pi^2*((Pi/2 - ArcTan[a*x])*(Log[1 - E^(I*(P
i/2 - ArcTan[a*x]))] - Log[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + I*(PolyLog[2,
 -E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTan[a*x]))])))/4
 + (3*Pi*((Pi/2 - ArcTan[a*x])^2*(Log[1 - E^(I*(Pi/2 - ArcTan[a*x]))] - Log
[1 + E^(I*(Pi/2 - ArcTan[a*x]))]) + (2*I)*(Pi/2 - ArcTan[a*x])*(PolyLog[2,
-E^(I*(Pi/2 - ArcTan[a*x]))] - PolyLog[2, E^(I*(Pi/2 - ArcTan[a*x]))]) + 2*
(-PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))] + PolyLog[3, E^(I*(Pi/2 - ArcTan[
a*x]))])))/2 - 8*((I/64)*(Pi/2 - ArcTan[a*x])^4 + (I/4)*(Pi/2 + (-1/2*Pi +
ArcTan[a*x])/2)^4 - ((Pi/2 - ArcTan[a*x])^3*Log[1 + E^(I*(Pi/2 - ArcTan[a*x
]))])/8 - (Pi^3*(I*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2) - Log[1 + E^((2*I)*(P
i/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/8 - (Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)
^3*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + ((3*I)/8)*(Pi/2
- ArcTan[a*x])^2*PolyLog[2, -E^(I*(Pi/2 - ArcTan[a*x]))] + (3*Pi^2*((I/2)*(
Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^2 - (Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*Lo
g[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + (I/2)*PolyLog[2, -E^(
(2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]))/4 + ((3*I)/2)*(Pi/2 + (-1/2*Pi
 + ArcTan[a*x])/2)^2*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2
))] - (3*(Pi/2 - ArcTan[a*x])*PolyLog[3, -E^(I*(Pi/2 - ArcTan[a*x]))])/4 -
(3*Pi*((I/3)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)^3 - (Pi/2 + (-1/2*Pi + ArcT
an[a*x])/2)^2*Log[1 + E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))] + I*(Pi
/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[2, -E^((2*I)*(Pi/2 + (-1/2*Pi + Arc
Tan[a*x])/2))] - PolyLog[3, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2))]/
```

```
2))/2 - (3*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2)*PolyLog[3, -E^((2*I)*(Pi/2 +
(-1/2*Pi + ArcTan[a*x])/2))])/2 - ((3*I)/4)*PolyLog[4, -E^(I*(Pi/2 - ArcTan
[a*x]))] - ((3*I)/4)*PolyLog[4, -E^((2*I)*(Pi/2 + (-1/2*Pi + ArcTan[a*x])/2
))])))/(8*Sqrt[1 + a^2*x^2]) + (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^3)/(16*Sq
rt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^4) + (Sqrt[c*(1 +
 a^2*x^2)]*(2*ArcTan[a*x] - ArcTan[a*x]^2 - ArcTan[a*x]^3))/(16*Sqrt[1 + a^
2*x^2]*(Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2])^2) - (Sqrt[c*(1 + a^2*x^2)
]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2
] - Sin[ArcTan[a*x]/2])^3) - (Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]^3)/(16*Sqrt
[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] + Sin[ArcTan[a*x]/2])^4) + (Sqrt[c*(1 + a
^2*x^2)]*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(8*Sqrt[1 + a^2*x^2]*(Cos[ArcTan
[a*x]/2] + Sin[ArcTan[a*x]/2])^3) + (Sqrt[c*(1 + a^2*x^2)]*(-2*ArcTan[a*x]
- ArcTan[a*x]^2 + ArcTan[a*x]^3))/(16*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2]
 + Sin[ArcTan[a*x]/2])^2) + (Sqrt[c*(1 + a^2*x^2)]*(Sin[ArcTan[a*x]/2] - Ar
cTan[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] +
 Sin[ArcTan[a*x]/2])) + (Sqrt[c*(1 + a^2*x^2)]*(-Sin[ArcTan[a*x]/2] + ArcTa
n[a*x]^2*Sin[ArcTan[a*x]/2]))/(4*Sqrt[1 + a^2*x^2]*(Cos[ArcTan[a*x]/2] - Si
n[ArcTan[a*x]/2])))
```

fricas [F] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^3}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^3/x^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.41, size = 655, normalized size = 0.64

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\,\left(2\arctan\left(ax\right)^3x^4a^4-2\arctan\left(ax\right)^2x^3a^3+9\arctan\left(ax\right)^3x^2a^2+2\arctan\left(ax\right)a^2x^2-23\,a\right.}{8x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^2,x)
```

```
[Out] 1/8*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(2*arctan(a*x)^3*x^4*a^4-2*arctan(a*x)^2*
x^3*a^3+9*arctan(a*x)^3*x^2*a^2+2*arctan(a*x)*a^2*x^2-23*arctan(a*x)^2*x*a-
8*arctan(a*x)^3-2*a*x)/x+1/8*I*a*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(15*I*arctan
(a*x)^3*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+24*I*arctan(a*x)^2*ln(1+(1+I*a*
x)/(a^2*x^2+1)^(1/2))-44*I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-
48*I*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-90*I*arctan(a*x)*polylog(3,I*(1
+I*a*x)/(a^2*x^2+1)^(1/2))-45*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))+48*I*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+45*arctan(a*x)^2*pol
```

```
ylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+44*I*arctan(a*x)*ln(1+I*(1+I*a*x)/(a
^2*x^2+1)^(1/2))+90*I*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))
-48*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-15*I*arctan(a*x)^3*l
n(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+48*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2
*x^2+1)^(1/2))-24*I*arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-44*poly
log(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+44*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))-90*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+90*polylog(4,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{5}{2}} \arctan\left(ax\right)^3}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3/x^2, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x^2,x)
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}} \operatorname{atan}^3\left(ax\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**3/x**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3/x**2, x)
```

3.434 $\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^3}{x^3}\,dx$

Optimal. Leaf size=1043

$$-\frac{1}{2}c^2x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2a^3+\frac{1}{3}c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^3a^2+2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3a^2+\frac{13ic^3\sqrt{a^2x^2+1}\,\text{ta}}{}$$

```
[Out] 1/3*a^2*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3-a^2*c^(5/2)*arctanh(a*x*c^(1/2)
/(a^2*c*x^2+c)^(1/2))-13*I*a^2*c^3*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*
x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5*a^2*c^3*arctan(a*x)^3
*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
-6*a^2*c^3*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)
^(1/2)/(a^2*c*x^2+c)^(1/2)+15*I*a^2*c^3*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+13*I*a^2*c^3*arctan(a*x)*polylog(
2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*
a^2*c^3*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c
*x^2+c)^(1/2)-15*I*a^2*c^3*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2
+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*I*a^2*c^3*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a
*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+15/2*I*a^2*c^3*arctan(a*x)
^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^
(1/2)-15*a^2*c^3*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x
^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+13*a^2*c^3*polylog(3,-I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-13*a^2*c^3*polylog(3,I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+15*a^2*c^3*a
rctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*
x^2+c)^(1/2)-15/2*I*a^2*c^3*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(
1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+13*I*a^2*c^3*arctan((1+I*a*x)/(
a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+a^2*c
^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)-3/2*a*c^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1
/2)/x-1/2*a^3*c^2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)+2*a^2*c^2*arctan(a*x)
^3*(a^2*c*x^2+c)^(1/2)-1/2*c^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x^2
```

Rubi [A] time = 3.54, antiderivative size = 1043, normalized size of antiderivative = 1.00, number of steps used = 87, number of rules used = 18, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.750, Rules used = {4950, 4962, 4944, 4958, 4954, 4956, 4183, 2531, 6609, 2282, 6589, 4930, 4890, 4888, 4181, 4880, 217, 206}

$$-\frac{1}{2}c^2x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2a^3+\frac{1}{3}c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^3a^2+2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3a^2+\frac{13ic^3\sqrt{a^2x^2+1}\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x] - (3*a*c^2*Sqrt[c + a^2*c*x^2]*ArcT
an[a*x]^2)/(2*x) - (a^3*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/2 + ((13*I
)*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/Sqrt[c
 + a^2*c*x^2] + 2*a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3 - (c^2*Sqrt[c +
 a^2*c*x^2]*ArcTan[a*x]^3)/(2*x^2) + (a^2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*
x]^3)/3 - (5*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*ArcTan[a*
x])])/Sqrt[c + a^2*c*x^2] - (6*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan
h[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - a^2*c^(5/2)*ArcTa
nh[(a*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]] + (((15*I)/2)*a^2*c^3*Sqrt[1 + a^2*x^
2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((13
*I)*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])
])/Sqrt[c + a^2*c*x^2] + ((13*I)*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Poly
Log[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (((15*I)/2)*a^2*c^3*Sqrt
```

```
[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x
^2] + ((3*I)*a^2*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, -(Sqrt[1 + I*a*x]/Sqrt[1
- I*a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^2*c^3*Sqrt[1 + a^2*x^2]*PolyLog[
2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (15*a^2*c^3*Sqrt
[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^
2] + (13*a^2*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt
[c + a^2*c*x^2] - (13*a^2*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*
x])])/Sqrt[c + a^2*c*x^2] + (15*a^2*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyL
og[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((15*I)*a^2*c^3*Sqrt[1 + a^
2*x^2]*PolyLog[4, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((15*I)*a^2*c^
3*Sqrt[1 + a^2*x^2]*PolyLog[4, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
```

```
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
```

```
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}{x^3}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^3}\,dx + \left(a^2c\right)\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x}\,dx$$

$$= c^2\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^3}\,dx + 2\left(\left(a^2c^2\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x}\,dx\right) + (a$$

$$= \frac{1}{3}a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3 - \left(a^3c^2\right)\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2\,dx + c^3\int \frac{t}{x^3}$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{c^2\sqrt{c+a^2cx^2}\,\tan}{2x^2}$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,t$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,t$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,t$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,t$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,t$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,t$$

$$= a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax) - \frac{3ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x} - \frac{1}{2}a^3c^2x\sqrt{c+a^2cx^2}\,t$$

Mathematica [A] time = 10.52, size = 1128, normalized size = 1.08

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x^3,x]
```

```
[Out] (a^2*c^2*Sqrt[c*(1 + a^2*x^2)]*(((-I)*Pi^4)/Sqrt[1 + a^2*x^2] + 8*ArcTan[a*
x]^3 + ((2*I)*ArcTan[a*x]^4)/Sqrt[1 + a^2*x^2] + (8*ArcTan[a*x]^3*Log[1 - E
^((-I)*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (24*ArcTan[a*x]^2*Log[1 - I*E^(I*
ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (24*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[
a*x])])/Sqrt[1 + a^2*x^2] - (8*ArcTan[a*x]^3*Log[1 + E^(I*ArcTan[a*x])])/Sq
rt[1 + a^2*x^2] + ((24*I)*ArcTan[a*x]^2*PolyLog[2, E^((-I)*ArcTan[a*x])])/S
qrt[1 + a^2*x^2] + ((24*I)*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/Sq
rt[1 + a^2*x^2] - ((48*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/S
qrt[1 + a^2*x^2] + ((48*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqr
t[1 + a^2*x^2] + (48*ArcTan[a*x]*PolyLog[3, E^((-I)*ArcTan[a*x])])/Sqrt[1 +
```

```
a^2*x^2] - (48*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^
2] + (48*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (48*PolyLo
g[3, I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((48*I)*PolyLog[4, E^((-I)*A
rcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((48*I)*PolyLog[4, -E^(I*ArcTan[a*x])])/S
qrt[1 + a^2*x^2]))/4 + a^2*c^2*((Sqrt[c*(1 + a^2*x^2)]*(I*ArcTan[E^(I*ArcTa
n[a*x])]*ArcTan[a*x]^2 - ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] - I*ArcTan[a*x]*P
olyLog[2, (-I)*E^(I*ArcTan[a*x])] + I*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[
a*x])] + PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - PolyLog[3, I*E^(I*ArcTan[a*x]
)]))/Sqrt[1 + a^2*x^2] + ((1 + a^2*x^2)*Sqrt[c*(1 + a^2*x^2)]*ArcTan[a*x]*(
6 + 4*ArcTan[a*x]^2 + 6*Cos[2*ArcTan[a*x]] - 3*ArcTan[a*x]*Sin[2*ArcTan[a*x
]]))/12) + (a^2*c^2*Sqrt[c*(1 + a^2*x^2)]*((-I)*Pi^4 + (2*I)*ArcTan[a*x]^4
- 12*ArcTan[a*x]^2*Cot[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Csc[ArcTan[a*x]/2]^
2 + 8*ArcTan[a*x]^3*Log[1 - E^((-I)*ArcTan[a*x])] + 48*ArcTan[a*x]*Log[1 -
E^(I*ArcTan[a*x])] - 48*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] - 8*ArcTan[a
*x]^3*Log[1 + E^(I*ArcTan[a*x])] + (24*I)*ArcTan[a*x]^2*PolyLog[2, E^((-I)*
ArcTan[a*x])] + (24*I)*(2 + ArcTan[a*x]^2)*PolyLog[2, -E^(I*ArcTan[a*x])] -
 (48*I)*PolyLog[2, E^(I*ArcTan[a*x])] + 48*ArcTan[a*x]*PolyLog[3, E^((-I)*A
rcTan[a*x])] - 48*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] - (48*I)*PolyL
og[4, E^((-I)*ArcTan[a*x])] - (48*I)*PolyLog[4, -E^(I*ArcTan[a*x])] + 2*Arc
Tan[a*x]^3*Sec[ArcTan[a*x]/2]^2 - 12*ArcTan[a*x]^2*Tan[ArcTan[a*x]/2]))/(16
*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\sqrt{a^2cx^2 + c}\,\arctan\left(ax\right)^3}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^3/x^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.74, size = 660, normalized size = 0.63

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\;\arctan\left(ax\right)\left(2\arctan\left(ax\right)^2x^4a^4 - 3\arctan\left(ax\right)x^3a^3 + 14\arctan\left(ax\right)^2x^2a^2 + 6a^2x^2 - 9\right.}{6x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^3,x)
```

```
[Out] 1/6*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(2*arctan(a*x)^2*x^4*a^4-3*ar
ctan(a*x)*x^3*a^3+14*arctan(a*x)^2*x^2*a^2+6*a^2*x^2-9*arctan(a*x)*x*a-3*ar
ctan(a*x)^2)/x^2-1/2*a^2*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(5*arctan(a*x)^3*ln(
1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-5*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(
1/2))+6*I*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-4*I*arctan((1+I*a*x)/(a^2*
```

```
x^2+1)^(1/2))+13*arctan(a*x)^2*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+26*I*arc
tan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-13*arctan(a*x)^2*ln(1+I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))+30*I*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6
*arctan(a*x)*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+15*I*arctan(a*x)^2*polylog(2
,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2
))-26*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*polylog(2,
-(1+I*a*x)/(a^2*x^2+1)^(1/2))-30*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1
)^(1/2))-30*I*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))+30*arctan(a*x)*polylog
(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-15*I*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a
^2*x^2+1)^(1/2))+26*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-26*polylog(3,-
I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{5}{2}} \arctan\left(ax\right)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3/x^3, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^{5/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x^3,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}} \operatorname{atan}^3\left(ax\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**3/x**3,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3/x**3, x)
```

3.435 $\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^3}{x^4}\,dx$

Optimal. Leaf size=1061

$$\frac{1}{2}c^2x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3a^4-\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3a^3}{\sqrt{a^2cx^2+c}}-\frac{3}{2}c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2a^3-$$

```
[Out] -1/3*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3/x^3-a^3*c^(5/2)*arctanh((a^2*c*x^2
+c)^(1/2)/c^(1/2))-15/2*I*a^3*c^3*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*
x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-13*I*a^3*c^3*arctan(a*x
)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1
/2)-13*a^3*c^3*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+
1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5*I*a^3*c^3*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2)
)*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-15*I*a^3*c^3*polylog(
4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+15*
I*a^3*c^3*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c
*x^2+c)^(1/2)+3*I*a^3*c^3*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^
2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^3*c^3*polylog(2,I*(1+I*a*x)^(1/2)/
(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*a^3*c^3*arctan(a
*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)
^(1/2)-13*a^3*c^3*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)
/(a^2*c*x^2+c)^(1/2)-15*a^3*c^3*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2
+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+15*a^3*c^3*arctan(a*x)*pol
ylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
+13*a^3*c^3*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c
*x^2+c)^(1/2)+13*I*a^3*c^3*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+15/2*I*a^3*c^3*arctan(a*x)^2*poly
log(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)
-a^2*c^2*arctan(a*x)*(a^2*c*x^2+c)^(1/2)/x-3/2*a^3*c^2*arctan(a*x)^2*(a^2*c
*x^2+c)^(1/2)-1/2*a*c^2*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/x^2-2*a^2*c^2*arc
tan(a*x)^3*(a^2*c*x^2+c)^(1/2)/x+1/2*a^4*c^2*x*arctan(a*x)^3*(a^2*c*x^2+c)^
(1/2)
```

Rubi [A] time = 3.38, antiderivative size = 1061, normalized size of antiderivative = 1.00, number of steps used = 86, number of rules used = 18, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.750, Rules used = {4950, 4944, 4962, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589, 4890, 4888, 4181, 6609, 4880, 4886}

$$\frac{1}{2}c^2x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3a^4-\frac{5ic^3\sqrt{a^2x^2+1}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3a^3}{\sqrt{a^2cx^2+c}}-\frac{3}{2}c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2a^3-$$

Antiderivative was successfully verified.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] -((a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/x) - (3*a^3*c^2*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x]^2)/2 - (a*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*x^2) -
 (2*a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/x + (a^4*c^2*x*Sqrt[c + a^2*
c*x^2]*ArcTan[a*x]^3)/2 - (c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3)/(3*x^3) -
 ((5*I)*a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3)/
Sqrt[c + a^2*c*x^2] - ((6*I)*a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*ArcTan[S
qrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (13*a^3*c^3*Sqrt[1 +
 a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - a
^3*c^(5/2)*ArcTanh[Sqrt[c + a^2*c*x^2]/Sqrt[c]] + ((13*I)*a^3*c^3*Sqrt[1 +
a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] +
(((15*I)/2)*a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*Ar
cTan[a*x])])/Sqrt[c + a^2*c*x^2] - (((15*I)/2)*a^3*c^3*Sqrt[1 + a^2*x^2]*Ar
```

```
cTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((13*I)*
a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c
 + a^2*c*x^2] + ((3*I)*a^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 +
I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^3*c^3*Sqrt[1 + a^2
*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2]
- (13*a^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^
2*c*x^2] - (15*a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*A
rcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (15*a^3*c^3*Sqrt[1 + a^2*x^2]*ArcTan[a*
x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (13*a^3*c^3*Sqrt[
1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((15*I)*a
^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c
*x^2] + ((15*I)*a^3*c^3*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/
Sqrt[c + a^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
```

```
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4880

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_.), x_
Symbol] :> -Simp[(b*p*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1))/(2*c*q*(2*
q + 1)), x] + (Dist[(2*d*q)/(2*q + 1), Int[(d + e*x^2)^(q - 1)*(a + b*ArcTa
n[c*x])^p, x], x] + Dist[(b^2*d*p*(p - 1))/(2*q*(2*q + 1)), Int[(d + e*x^2)
^(q - 1)*(a + b*ArcTan[c*x])^(p - 2), x], x] + Simp[(x*(d + e*x^2)^q*(a + b
*ArcTan[c*x])^p)/(2*q + 1), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*
d] && GtQ[q, 0] && GtQ[p, 1]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4950

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Dist[d, Int[(f*x)^m*(d + e*x^2)^(q - 1)*(a +
b*ArcTan[c*x])^p, x], x] + Dist[(c^2*d)/f^2, Int[(f*x)^(m + 2)*(d + e*x^2)^
(q - 1)*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] &&
 EqQ[e, c^2*d] && GtQ[q, 0] && IGtQ[p, 0] && (RationalQ[m] || (EqQ[p, 1] &&
 IntegerQ[q]))
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
```

```
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}{x^4}\,dx = c\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^4}\,dx + \left(a^2c\right)\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}{x^2}\,dx$$

$$= c^2\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^4}\,dx + 2\left(\left(a^2c^2\right)\int \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{x^2}\,dx\right) +$$

$$= -\frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{c\left(c+a^2c\right.}{}$$

$$= -\frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 + \frac{1}{2}a^4c^2x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3 - \frac{c\left(c+a^2c\right.}{}$$

$$= -\frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{ac^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2x^2} + \frac{1}{2}a^4c^2x\sqrt{c+a}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{ac^2\sqrt{c+a^2cx}}{2x}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{ac^2\sqrt{c+a^2cx}}{2x}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{ac^2\sqrt{c+a^2cx}}{2x}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{ac^2\sqrt{c+a^2cx}}{2x}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{ac^2\sqrt{c+a^2cx}}{2x}$$

$$= -\frac{a^2c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{x} - \frac{3}{2}a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2 - \frac{ac^2\sqrt{c+a^2cx}}{2x}$$

Mathematica [A] time = 11.50, size = 1771, normalized size = 1.67

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3)/x^4,x]
```

```
[Out] ((-1/2*I)*a^3*c^2*Sqrt[c*(1 + a^2*x^2)]*(12*ArcTan[E^(I*ArcTan[a*x])]*ArcTa
n[a*x] - (3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2 + I*a*x*Sqrt[1 + a^2*x^2]*Ar
cTan[a*x]^3 + 2*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3 - 3*(2 + ArcTan[a*x
]^2)*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + 3*(2 + ArcTan[a*x]^2)*PolyLog[2,
I*E^(I*ArcTan[a*x])] - (6*I)*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])]
 + (6*I)*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])] + 6*PolyLog[4, (-I)*E^
(I*ArcTan[a*x])] - 6*PolyLog[4, I*E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2*x^2] +
(a^3*c^2*Sqrt[c*(1 + a^2*x^2)]*Csc[ArcTan[a*x]/2]*(((-7*I)*a*Pi^4*x)/Sqrt[1
 + a^2*x^2] - ((8*I)*a*Pi^3*x*ArcTan[a*x])/Sqrt[1 + a^2*x^2] + ((24*I)*a*Pi
^2*x*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] - 64*ArcTan[a*x]^3 - ((32*I)*a*Pi*x*A
```

```
rcTan[a*x]^3)/Sqrt[1 + a^2*x^2] + ((16*I)*a*x*ArcTan[a*x]^4)/Sqrt[1 + a^2*x
^2] + (48*a*Pi^2*x*ArcTan[a*x]*Log[1 - I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x
^2] - (96*a*Pi*x*ArcTan[a*x]^2*Log[1 - I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x
^2] - (8*a*Pi^3*x*Log[1 + I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (64*a*x
*ArcTan[a*x]^3*Log[1 + I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (192*a*x*A
rcTan[a*x]^2*Log[1 - E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (8*a*Pi^3*x*Lo
g[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (48*a*Pi^2*x*ArcTan[a*x]*Lo
g[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (96*a*Pi*x*ArcTan[a*x]^2*Lo
g[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (64*a*x*ArcTan[a*x]^3*Log[1
 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (192*a*x*ArcTan[a*x]^2*Log[1 +
 E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (8*a*Pi^3*x*Log[Tan[(Pi + 2*ArcTan
[a*x])/4]])/Sqrt[1 + a^2*x^2] + ((192*I)*a*x*ArcTan[a*x]^2*PolyLog[2, (-I)/
E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((48*I)*a*Pi*x*(Pi - 4*ArcTan[a*x])
*PolyLog[2, I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((384*I)*a*x*ArcTan[a
*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((48*I)*a*Pi^2*x*Po
lyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((192*I)*a*Pi*x*ArcTa
n[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((192*I)*a*x
*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((38
4*I)*a*x*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (38
4*a*x*ArcTan[a*x]*PolyLog[3, (-I)/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (
192*a*Pi*x*PolyLog[3, I/E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (384*a*x*Po
lyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (192*a*Pi*x*PolyLog[3, (-
I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (384*a*x*ArcTan[a*x]*PolyLog[3,
(-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (384*a*x*PolyLog[3, E^(I*ArcTa
n[a*x])])/Sqrt[1 + a^2*x^2] - ((384*I)*a*x*PolyLog[4, (-I)/E^(I*ArcTan[a*x]
)])/Sqrt[1 + a^2*x^2] - ((384*I)*a*x*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/Sq
rt[1 + a^2*x^2])*Sec[ArcTan[a*x]/2])/(64*Sqrt[1 + a^2*x^2]) + (a^3*c^3*Sqrt
[1 + a^2*x^2]*(-12*ArcTan[a*x]*Cot[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Cot[Arc
Tan[a*x]/2] - 3*ArcTan[a*x]^2*Csc[ArcTan[a*x]/2]^2 - (a*x*ArcTan[a*x]^3*Csc
[ArcTan[a*x]/2]^4)/(2*Sqrt[1 + a^2*x^2]) + 12*ArcTan[a*x]^2*Log[1 - E^(I*Ar
cTan[a*x])] - 12*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + 24*Log[Tan[ArcT
an[a*x]/2]] + (24*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] - (24*I)*Ar
cTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] - 24*PolyLog[3, -E^(I*ArcTan[a*x])]
 + 24*PolyLog[3, E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]^2*Sec[ArcTan[a*x]/2]^2
- (8*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^3*Sin[ArcTan[a*x]/2]^4)/(a^3*x^3) - 12
*ArcTan[a*x]*Tan[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Tan[ArcTan[a*x]/2]))/(24*
Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.75, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^{4} c^{2} x^{4}+2 a^{2} c^{2} x^{2}+c^{2}\right) \sqrt{a^{2} c x^{2}+c} \arctan \left(a x\right)^{3}}{x^{4}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^4,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*arctan(a*x
)^3/x^4, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^4,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.04, size = 699, normalized size = 0.66

$$\frac{c^2\sqrt{c\,(ax-i)\,(ax+i)}\ \arctan(ax)\left(3\arctan(ax)^2\,x^4a^4-9\arctan(ax)\,x^3a^3-14\arctan(ax)^2\,x^2a^2-6a^2x^2-3\right.}{6x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^4,x)
```

```
[Out] 1/6*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*arctan(a*x)*(3*arctan(a*x)^2*x^4*a^4-9*ar
ctan(a*x)*x^3*a^3-14*arctan(a*x)^2*x^2*a^2-6*a^2*x^2-3*arctan(a*x)*x*a-2*ar
ctan(a*x)^2)/x^3+1/2*I*a^3*c^2*(c*(a*x-I)*(I+a*x))^(1/2)*(5*I*arctan(a*x)^3
*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+13*I*arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2
*x^2+1)^(1/2))-6*I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-13*I*arc
tan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-26*I*polylog(3,(1+I*a*x)/(a^2*
x^2+1)^(1/2))-30*I*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+26*
I*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan(a*x)*ln(1+I*(1+I*a*x)/
(a^2*x^2+1)^(1/2))+15*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2
))-15*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*ln(1+(1+I*
a*x)/(a^2*x^2+1)^(1/2))+30*I*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))-2*I*ln((1+I*a*x)/(a^2*x^2+1)^(1/2)-1)-5*I*arctan(a*x)^3*ln(1-I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))+26*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1
/2))-26*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(2,-I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+30*p
olylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-30*polylog(4,-I*(1+I*a*x)/(a^2*x^2+
1)^(1/2)))/(a^2*x^2+1)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan(ax)^3}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^3/x^4,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3/x^4, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\operatorname{atan}(a\,x)^3\left(c\,a^2\,x^2+c\right)^{5/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x^4,x)
```

```
[Out] int((atan(a*x)^3*(c + a^2*c*x^2)^(5/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^3(ax)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**3/x**4,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3/x**4, x)
```

3.436 $\int \frac{x^3 \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=408

$$\frac{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3}{3a^2c}+\frac{5i\sqrt{a^2x^2+1}\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^4\sqrt{a^2cx^2+c}}-\frac{5i\sqrt{a^2x^2+1}\tan^{-1}(ax)\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a^4\sqrt{a^2cx^2+c}}-\frac{5\sqrt{}}{}$$

```
[Out] -arctanh(a*x*c^(1/2)/(a^2*c*x^2+c)^(1/2))/a^4/c^(1/2)-5*I*arctan((1+I*a*x)/
(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+
5*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)
/a^4/(a^2*c*x^2+c)^(1/2)-5*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)-5*polylog(3,-I*(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+5*polylog(3,I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/(a^2*c*x^2+c)^(1/2)+arcta
n(a*x)*(a^2*c*x^2+c)^(1/2)/a^4/c-1/2*x*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/a^
3/c-2/3*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^4/c+1/3*x^2*arctan(a*x)^3*(a^2*
c*x^2+c)^(1/2)/a^2/c
```

Rubi [A] time = 0.73, antiderivative size = 408, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4952, 4930, 217, 206, 4890, 4888, 4181, 2531, 2282, 6589}

$$\frac{5i\sqrt{a^2x^2+1}\tan^{-1}(ax)\mathrm{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^4\sqrt{a^2cx^2+c}}-\frac{5i\sqrt{a^2x^2+1}\tan^{-1}(ax)\mathrm{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^4\sqrt{a^2cx^2+c}}-\frac{5\sqrt{a^2x^2+1}\,\mathrm{Po}}{a^4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(a^4*c) - (x*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x]^2)/(2*a^3*c) - ((5*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTa
n[a*x]^2)/(a^4*Sqrt[c + a^2*c*x^2]) - (2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)
/(3*a^4*c) + (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(3*a^2*c) - ArcTanh[(a
*Sqrt[c]*x)/Sqrt[c + a^2*c*x^2]]/(a^4*Sqrt[c]) + ((5*I)*Sqrt[1 + a^2*x^2]*A
rcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^4*Sqrt[c + a^2*c*x^2]) -
((5*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^4*
Sqrt[c + a^2*c*x^2]) - (5*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x
])])/(a^4*Sqrt[c + a^2*c*x^2]) + (5*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*Arc
Tan[a*x])])/(a^4*Sqrt[c + a^2*c*x^2])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}dx = \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{3a^2c} - \frac{2\int \frac{x\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}dx}{3a^2} - \frac{\int \frac{x^2\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}dx}{a}$$

$$= -\frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3c} - \frac{2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{3a^4c} + \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{3a^2c} + \frac{\int \frac{\tan^{-1}}{\sqrt{c+}}}{2}$$

$$= \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a^4c} - \frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3c} - \frac{2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{3a^4c} + \frac{x^2\sqrt{c+a^2c}}{3}$$

$$= \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a^4c} - \frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3c} - \frac{2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}{3a^4c} + \frac{x^2\sqrt{c+a^2c}}{3}$$

$$= \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a^4c} - \frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3c} - \frac{5i\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(a}{a^4\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a^4c} - \frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3c} - \frac{5i\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(a}{a^4\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a^4c} - \frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3c} - \frac{5i\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(a}{a^4\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}{a^4c} - \frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}{2a^3c} - \frac{5i\sqrt{1+a^2x^2}\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(a}{a^4\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.85, size = 220, normalized size = 0.54

$$\frac{\sqrt{a^2cx^2+c}\left(-\left(a^2x^2+1\right)\tan^{-1}(ax)\left(2\tan^{-1}(ax)^2+3\tan^{-1}(ax)\sin\left(2\tan^{-1}(ax)\right)+6\left(\tan^{-1}(ax)^2-1\right)\cos\left(2\tan\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*((12*((-5*I)*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2 -
 ArcTanh[(a*x)/Sqrt[1 + a^2*x^2]] + (5*I)*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*
ArcTan[a*x])] - (5*I)*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])] - 5*PolyL
og[3, (-I)*E^(I*ArcTan[a*x])] + 5*PolyLog[3, I*E^(I*ArcTan[a*x])]))/Sqrt[1
+ a^2*x^2] - (1 + a^2*x^2)*ArcTan[a*x]*(-6 + 2*ArcTan[a*x]^2 + 6*(-1 + ArcT
an[a*x]^2)*Cos[2*ArcTan[a*x]] + 3*ArcTan[a*x]*Sin[2*ArcTan[a*x]])))/(12*a^4
*c)
```

fricas [F] time = 0.74, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^3\arctan(ax)^3}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(x^3*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.46, size = 380, normalized size = 0.93

$$\frac{\left(2\arctan(ax)^2 x^2a^2 - 3\arctan(ax)\,xa - 4\arctan(ax)^2 + 6\right)\arctan(ax)\sqrt{c\,(ax-i)\,(ax+i)}}{6c\,a^4} - \frac{5i\left(3i\ln\left(1 - \frac{i(i}{\sqrt{a^}}\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/6*(2*arctan(a*x)^2*x^2*a^2-3*arctan(a*x)*x*a-4*arctan(a*x)^2+6)*arctan(a*
x)*(c*(a*x-I)*(I+a*x))^(1/2)/c/a^4-5/6*I*(3*I*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))*arctan(a*x)^2+arctan(a*x)^3+6*I*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))+6*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+
a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^4/c+5/6*I*(3*I*arctan(a*x)^2*ln(1+I*(1+I*a*
x)/(a^2*x^2+1)^(1/2))+arctan(a*x)^3+6*I*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))+6*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*
(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^4/c+2*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/
2))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^4/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\arctan(ax)^3}{\sqrt{a^2cx^2 + c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\mathrm{atan}(a\,x)^3}{\sqrt{c\,a^2\,x^2 + c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\,\mathrm{atan}^3(ax)}{\sqrt{c\left(a^2x^2 + 1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**3*atan(a*x)**3/sqrt(c*(a**2*x**2 + 1)), x)
```

3.437 $\int \frac{x^2 \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} dx$

Optimal. Leaf size=625

$$\frac{x\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3}{2a^2c}+\frac{3i\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^3\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{i\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{a^3\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{Li}_2\left(-\right.}{2a^3\sqrt{a^2cx^2+c}}$$

```
[Out] I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a^3/(
a^2*c*x^2+c)^(1/2)-6*I*arctan(a*x)*arctan((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*
(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3/2*I*arctan(a*x)^2*polylog(2,-I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+3/2*
I*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/
a^3/(a^2*c*x^2+c)^(1/2)+3*I*polylog(2,-I*(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(
a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3*I*polylog(2,I*(1+I*a*x)^(1/2)/(1
-I*a*x)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)+3*arctan(a*x)*poly
log(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(
1/2)-3*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/
2)/a^3/(a^2*c*x^2+c)^(1/2)+3*I*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a
^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3*I*polylog(4,I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/(a^2*c*x^2+c)^(1/2)-3/2*arctan(a*x)^2*(a^2*
c*x^2+c)^(1/2)/a^3/c+1/2*x*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^2/c
```

Rubi [A] time = 0.49, antiderivative size = 625, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4952, 4930, 4890, 4886, 4888, 4181, 2531, 6609, 2282, 6589}

$$\frac{3i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^3\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{i\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{a^3\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\tan^{-1}(ax)^2\text{PolyLog}\left(2,-ie\right.}{2a^3\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (-3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*a^3*c) + (x*Sqrt[c + a^2*c*x^2]*A
rcTan[a*x]^3)/(2*a^2*c) + (I*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*Ar
cTan[a*x]^3)/(a^3*Sqrt[c + a^2*c*x^2]) - ((6*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*
x]*ArcTan[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) - (((
3*I)/2)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])
/(a^3*Sqrt[c + a^2*c*x^2]) + (((3*I)/2)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Pol
yLog[2, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) + ((3*I)*Sqrt[1 + a
^2*x^2]*PolyLog[2, ((-I)*Sqrt[1 + I*a*x])/Sqrt[1 - I*a*x]])/(a^3*Sqrt[c + a
^2*c*x^2]) - ((3*I)*Sqrt[1 + a^2*x^2]*PolyLog[2, (I*Sqrt[1 + I*a*x])/Sqrt[1
 - I*a*x]])/(a^3*Sqrt[c + a^2*c*x^2]) + (3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Po
lyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[1 + a
^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^3*Sqrt[c + a^2*c*x^
2]) + ((3*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/(a^3*Sqr
t[c + a^2*c*x^2]) - ((3*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])
])/(a^3*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4886

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/Sqrt[(d_) + (e_.)*(x_)^2], x_Symbol]
 :> Simp[(-2*I*(a + b*ArcTan[c*x])*ArcTan[Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])
/(c*Sqrt[d]), x] + (Simp[(I*b*PolyLog[2, -((I*Sqrt[1 + I*c*x])/Sqrt[1 - I*c
*x])])/(c*Sqrt[d]), x] - Simp[(I*b*PolyLog[2, (I*Sqrt[1 + I*c*x])/Sqrt[1 -
I*c*x]])/(c*Sqrt[d]), x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
GtQ[d, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4952

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[(f*(f*x)^(m - 1)*Sqrt[d + e*x^2]*(a + b*
ArcTan[c*x])^p)/(c^2*d*m), x] + (-Dist[(b*f*p)/(c*m), Int[((f*x)^(m - 1)*(a
 + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(f^2*(m - 1))/(c^
2*m), Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^2], x], x]) /;
 FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx = \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} - \frac{\int \frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx}{2a^2} - \frac{3\int \frac{x\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{2a}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} + \frac{3\int \frac{\tan^{-1}(ax)}{\sqrt{c+a^2cx^2}}\,dx}{a^2} - \frac{\sqrt{1+a^2x^2}\int \frac{\tan}{\sqrt{}}}{2a^2\sqrt{c+a^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} - \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int x^3\sec(x)\,dx,\right.}{2a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-}}{a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-}}{a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-}}{a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-}}{a^3\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2a^3c} + \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2a^2c} + \frac{i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-}}{a^3\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 7.87, size = 812, normalized size = 1.30

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{1}{2}i\tan^{-1}(ax)^4 - 2\log\left(1+ie^{-i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3 + 2\log\left(1+ie^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3 + \frac{}{\left(\cos\left(\frac{1}{2}\tan\right.\right.}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(((7*I)/32)*Pi^4 + (I/4)*Pi^3*ArcTan[a*x] - 6*ArcTan
[a*x]^2 - ((3*I)/4)*Pi^2*ArcTan[a*x]^2 + I*Pi*ArcTan[a*x]^3 - (I/2)*ArcTan[
a*x]^4 - (3*Pi^2*ArcTan[a*x]*Log[1 - I/E^(I*ArcTan[a*x])])/2 + 3*Pi*ArcTan[
a*x]^2*Log[1 - I/E^(I*ArcTan[a*x])] + (Pi^3*Log[1 + I/E^(I*ArcTan[a*x])])/4
 - 2*ArcTan[a*x]^3*Log[1 + I/E^(I*ArcTan[a*x])] + 12*ArcTan[a*x]*Log[1 - I*
E^(I*ArcTan[a*x])] - (Pi^3*Log[1 + I*E^(I*ArcTan[a*x])])/4 - 12*ArcTan[a*x]
*Log[1 + I*E^(I*ArcTan[a*x])] + (3*Pi^2*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a
```

```
*x])])/2 - 3*Pi*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] + 2*ArcTan[a*x]^
3*Log[1 + I*E^(I*ArcTan[a*x])] - (Pi^3*Log[Tan[(Pi + 2*ArcTan[a*x])/4]])/4
- (6*I)*ArcTan[a*x]^2*PolyLog[2, (-I)/E^(I*ArcTan[a*x])] - ((3*I)/2)*Pi*(Pi
 - 4*ArcTan[a*x])*PolyLog[2, I/E^(I*ArcTan[a*x])] + (12*I)*PolyLog[2, (-I)*
E^(I*ArcTan[a*x])] - ((3*I)/2)*Pi^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (6
*I)*Pi*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (6*I)*ArcTan[a*x]^2
*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (12*I)*PolyLog[2, I*E^(I*ArcTan[a*x])
] - 12*ArcTan[a*x]*PolyLog[3, (-I)/E^(I*ArcTan[a*x])] + 6*Pi*PolyLog[3, I/E
^(I*ArcTan[a*x])] - 6*Pi*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 12*ArcTan[a*x
]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + (12*I)*PolyLog[4, (-I)/E^(I*ArcTan[a
*x])] + (12*I)*PolyLog[4, (-I)*E^(I*ArcTan[a*x])] + ArcTan[a*x]^3/(Cos[ArcT
an[a*x]/2] - Sin[ArcTan[a*x]/2])^2 - (6*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(
Cos[ArcTan[a*x]/2] - Sin[ArcTan[a*x]/2]) - ArcTan[a*x]^3/(Cos[ArcTan[a*x]/2
] + Sin[ArcTan[a*x]/2])^2 + (6*ArcTan[a*x]^2*Sin[ArcTan[a*x]/2])/(Cos[ArcTa
n[a*x]/2] + Sin[ArcTan[a*x]/2])))/(4*a^3*c*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^2 \arctan(ax)^3}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(x^2*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.42, size = 430, normalized size = 0.69

$$\frac{(\arctan(ax)\,xa-3)\arctan(ax)^2\sqrt{c\,(ax-i)\,(ax+i)}}{2c\,a^3}+\frac{i\left(i\arctan(ax)^3\ln\left(1-\frac{i(iax+1)}{\sqrt{a^2x^2+1}}\right)-i\arctan(ax)^3\ln\left(1+\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] 1/2*(arctan(a*x)*x*a-3)*arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/c/a^3+1/2*I
*(I*arctan(a*x)^3*ln(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)^3*ln(1+
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*ln(1-I*(1+I*a*x)/(a^2*x^2+1)
^(1/2))+6*I*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan
(a*x)*ln(1+I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(3,-I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+1)^
(1/2))-3*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*dilog(1+
I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*dilog(1-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*p
olylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1
)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/a^3/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)^3}{\sqrt{a^2cx^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^3}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\operatorname{atan}^{3}{\left(ax \right)}}{\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**3/sqrt(c*(a**2*x**2 + 1)), x)
```

3.438 $\int \frac{x\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=283

$$-\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{6\sqrt{a^2x^2+1}\,\text{Li}_3\left(-ie^{i\tan^{-1}(\cdot\right.}}{a^2\sqrt{a^2cx^2+c}}$$

```
[Out] 6*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^2
/(a^2*c*x^2+c)^(1/2)-6*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+6*I*arctan(a*x)*polylog(2,I*(
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^(1/2)+6*pol
ylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2*c*x^2+c)^
(1/2)-6*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^2/(a^2
*c*x^2+c)^(1/2)+arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^2/c
```

Rubi [A] time = 0.23, antiderivative size = 283, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4930, 4890, 4888, 4181, 2531, 2282, 6589}

$$-\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^2\sqrt{a^2cx^2+c}}+6\sqrt{a^2x^2+}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] ((6*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^2*Sqrt
[c + a^2*c*x^2]) + (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(a^2*c) - ((6*I)*Sqr
t[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^2*Sqrt[c
+ a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcT
an[a*x])])/(a^2*Sqrt[c + a^2*c*x^2]) + (6*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)
*E^(I*ArcTan[a*x])])/(a^2*Sqrt[c + a^2*c*x^2]) - (6*Sqrt[1 + a^2*x^2]*PolyL
og[3, I*E^(I*ArcTan[a*x])])/(a^2*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx = \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^2c} - \frac{3\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}\,dx}{a}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^2c} - \frac{\left(3\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)^2}{\sqrt{1+a^2x^2}}\,dx}{a\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^2c} - \frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^2\sec(x)\,dx, x, \tan^{-1}(ax)\right)}{a^2\sqrt{c+a^2cx^2}}$$

$$= \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^2c} + \frac{\left(6\sqrt{1+a^2x^2}\right)\text{Subst}}{}$$

$$= \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^2c} - \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}(a}{a^2\sqrt{c+}}$$

$$= \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^2c} - \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}(a}{a^2\sqrt{c+}}$$

$$= \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^2}{a^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^2c} - \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}(a}{a^2\sqrt{c+}}$$

Mathematica [A] time = 0.30, size = 168, normalized size = 0.59

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(\tan^{-1}(ax)^3 - \frac{3\left(2i\tan^{-1}(ax)\left(\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)-\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)\right)-2\text{Li}_3\left(-ie^{i\tan^{-1}(ax)}\right)+2\text{Li}_3\left(ie^{i\tan^{-1}(ax)}\right)+\tan^{-1}(ax)^2\left(\log(1\right.\right.}{\sqrt{a^2x^2+1}}\right.}{a^2c}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(ArcTan[a*x]^3 - (3*(ArcTan[a*x]^2*(Log[1 - I*E^(I*A
rcTan[a*x])] - Log[1 + I*E^(I*ArcTan[a*x])]) + (2*I)*ArcTan[a*x]*(PolyLog[2
, (-I)*E^(I*ArcTan[a*x])] - PolyLog[2, I*E^(I*ArcTan[a*x])]) - 2*PolyLog[3,
 (-I)*E^(I*ArcTan[a*x])] + 2*PolyLog[3, I*E^(I*ArcTan[a*x])]))/Sqrt[1 + a^2
*x^2]))/(a^2*c)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x \arctan\left(ax\right)^{3}}{\sqrt{a^{2} c x^{2} + c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(x*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.48, size = 0, normalized size = 0.00

$$\int \frac{x \arctan\left(ax\right)^{3}}{\sqrt{a^{2} c\, x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \arctan\left(ax\right)^{3}}{\sqrt{a^{2} c x^{2} + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,{\mathrm{atan}\left(a\,x\right)}^3}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{atan}^3(ax)}{\sqrt{c(a^2x^2+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x*atan(a*x)**3/sqrt(c*(a**2*x**2 + 1)), x)
```

3.439 $\int \frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=368

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_3}{a\sqrt{a^2cx^2+c}}$$

```
[Out] -2*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a/
(a^2*c*x^2+c)^(1/2)+3*I*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-3*I*arctan(a*x)^2*polylog(2,I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-6*arct
an(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*
c*x^2+c)^(1/2)+6*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*
x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)-6*I*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(
1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)+6*I*polylog(4,I*(1+I*a*x)/(a^
2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 368, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4890, 4888, 4181, 2531, 6609, 2282, 6589}

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] ((-2*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3)/(a*Sqrt[
c + a^2*c*x^2]) + ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, (-I)*E^
(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan
[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) - (6*Sqrt[
1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^
2*c*x^2]) + (6*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])
])/(a*Sqrt[c + a^2*c*x^2]) - ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*
ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4
, I*E^(I*ArcTan[a*x])])/(a*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
```

```
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^3}{\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int x^3\sec(x)\,dx, x, \tan^{-1}(ax)\right)}{a\sqrt{c+a^2cx^2}}$$

$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{a\sqrt{c+a^2cx^2}} - \frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^2\log\left(1-ie^{ix}\right)\,dx, x, \ldots\right.}{a\sqrt{c+a^2cx^2}}$$

$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{a\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{c+a^2cx^2}} - \ldots$$

$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{a\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{c+a^2cx^2}} - \ldots$$

$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{a\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{c+a^2cx^2}} - \ldots$$

$$= -\frac{2i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\tan^{-1}(ax)^3}{a\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a\sqrt{c+a^2cx^2}} - \ldots$$

Mathematica [A] time = 0.15, size = 190, normalized size = 0.52

$$-\frac{i\sqrt{c\left(a^2x^2+1\right)}\left(-3\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)+3\tan^{-1}(ax)^2\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)-6i\tan^{-1}(ax)\text{Li}_3\left(-ie^{i\tan^{-1}(ax}\right.\right.}{ac\sqrt{a^2x}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^3/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] ((-I)*Sqrt[c*(1 + a^2*x^2)]*(2*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^3 - 3*
ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]^2*PolyLog[
2, I*E^(I*ArcTan[a*x])] - (6*I)*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x
])] + (6*I)*ArcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])] + 6*PolyLog[4, (-I)
*E^(I*ArcTan[a*x])] - 6*PolyLog[4, I*E^(I*ArcTan[a*x])]))/(a*c*Sqrt[1 + a^2
*x^2])
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan\left(ax\right)^3}{\sqrt{a^2cx^2+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^3}{\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^3}{\sqrt{a^2cx^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^3/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**3/sqrt(c*(a**2*x**2 + 1)), x)
```

3.440 $\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=327

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_3\left(\right.}{\sqrt{a^2cx^2+c}}$$

```
[Out] -2*arctan(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^
2*c*x^2+c)^(1/2)+3*I*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*
(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*arctan(a*x)^2*polylog(2,(1+I*a*x)
/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*arctan(a*x)*pol
ylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+
6*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2
*c*x^2+c)^(1/2)-6*I*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/
2)/(a^2*c*x^2+c)^(1/2)+6*I*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+
1)^(1/2)/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.28, antiderivative size = 327, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4958, 4956, 4183, 2531, 6609, 2282, 6589}

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-6\sqrt{a^2x^2+1}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^
2*c*x^2] + ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a
*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog
[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (6*Sqrt[1 + a^2*x^2]*ArcTan[a
*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + (6*Sqrt[1 + a^2*x
^2]*ArcTan[a*x]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((6*I)
*Sqrt[1 + a^2*x^2]*PolyLog[4, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((
6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
```

```
[m, 0]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^3}{x\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int x^3\csc(x)\,dx, x, \tan^{-1}(ax)\right)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} - \frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^2\log\left(1-e^{ix}\right)\,dx,\right.}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} -$$

$$= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} -$$

$$= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} -$$

$$= -\frac{2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} + \frac{3i\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}} -$$

Mathematica [A] time = 0.24, size = 208, normalized size = 0.64

$$-\frac{i\sqrt{a^2x^2+1}\left(-24\tan^{-1}(ax)^2\text{Li}_2\left(e^{-i\tan^{-1}(ax)}\right)-24\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)+48i\tan^{-1}(ax)\text{Li}_3\left(e^{-i\tan^{-1}(ax)}\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] ((-1/8*I)*Sqrt[1 + a^2*x^2]*(Pi^4 - 2*ArcTan[a*x]^4 + (8*I)*ArcTan[a*x]^3*L
og[1 - E^((-I)*ArcTan[a*x])] - (8*I)*ArcTan[a*x]^3*Log[1 + E^(I*ArcTan[a*x]
)] - 24*ArcTan[a*x]^2*PolyLog[2, E^((-I)*ArcTan[a*x])] - 24*ArcTan[a*x]^2*P
olyLog[2, -E^(I*ArcTan[a*x])] + (48*I)*ArcTan[a*x]*PolyLog[3, E^((-I)*ArcTa
n[a*x])] - (48*I)*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] + 48*PolyLog[4
, E^((-I)*ArcTan[a*x])] + 48*PolyLog[4, -E^(I*ArcTan[a*x])]))/Sqrt[c*(1 + a
^2*x^2)]
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\arctan(ax)^3}{a^2cx^3+cx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^2*c*x^3 + c*x), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.94, size = 261, normalized size = 0.80

$$\frac{i\left(i\arctan(ax)^3\ln\left(1+\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-i\arctan(ax)^3\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)+3\arctan(ax)^2\text{polylog}\left(2,-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)+6i\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] I*(I*arctan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)^3*ln(1-(
1+I*a*x)/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1
)^(1/2))+6*I*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a
*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(3,(1+I
*a*x)/(a^2*x^2+1)^(1/2))-6*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylo
g(4,(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/
2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)^3}{\sqrt{a^2cx^2+c}\,x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/(sqrt(a^2*c*x^2 + c)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)^3}{x\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{x\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**3/(x*sqrt(c*(a**2*x**2 + 1))), x)
```

3.441 $\int \frac{\tan^{-1}(ax)^3}{x^2\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=260

$$\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{6a\sqrt{a^2x^2+1}\,\text{Li}_3\left(-e^{i\tan^{-1}(a}\right.}{\sqrt{a^2cx^2+c}}$$

```
[Out] -6*a*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(
a^2*c*x^2+c)^(1/2)+6*I*a*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*I*a*arctan(a*x)*polylog(2,(1+I*a*
x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-6*a*polylog(3,-
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+6*a*poly
log(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-ar
ctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/c/x
```

Rubi [A] time = 0.37, antiderivative size = 260, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4944, 4958, 4956, 4183, 2531, 2282, 6589}

$$\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}-\frac{6a\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(c*x)) - (6*a*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((6*I)*a*Sqrt[1
+ a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
- ((6*I)*a*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqr
t[c + a^2*c*x^2] - (6*a*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/S
qrt[c + a^2*c*x^2] + (6*a*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/
Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^2\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{cx}+(3a)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{cx}+\frac{\left(3a\sqrt{1+a^2x^2}\right)\int \frac{\tan^{-1}(ax)^2}{x\sqrt{1+a^2x^2}}\,dx}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{cx}+\frac{\left(3a\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int x^2\csc(x)\,dx,x,\tan^{-1}(ax)\right)}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{cx}-\frac{6a\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}}-\frac{\left(6a\sqrt{1+a^2x^2}\right)}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{cx}-\frac{6a\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}}+\frac{6ia\sqrt{1+a^2x^2}\,\mathrm{t}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{cx}-\frac{6a\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}}+\frac{6ia\sqrt{1+a^2x^2}\,\mathrm{t}}{}$$

$$= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{cx}-\frac{6a\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^2\tanh^{-1}\left(e^{i\tan^{-1}(ax)}\right)}{\sqrt{c+a^2cx^2}}+\frac{6ia\sqrt{1+a^2x^2}\,\mathrm{t}}{}$$

Mathematica [A] time = 0.34, size = 174, normalized size = 0.67

$$-\frac{a\sqrt{a^2x^2+1}\left(\frac{\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^3}{ax}-6i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)+6i\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right)+6\mathrm{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)\right.}{\sqrt{c\left(a^2x^2+1\right)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((a*Sqrt[1 + a^2*x^2]*((Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3)/(a*x) - 3*ArcTan[
a*x]^2*Log[1 - E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x
])] - (6*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] + (6*I)*ArcTan[a*x]*
PolyLog[2, E^(I*ArcTan[a*x])] + 6*PolyLog[3, -E^(I*ArcTan[a*x])] - 6*PolyLo
g[3, E^(I*ArcTan[a*x])]))/Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{a^2cx^4+cx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^2*c*x^4 + c*x^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.90, size = 230, normalized size = 0.88

$$-\frac{\arctan(ax)^3\sqrt{c(ax-i)(ax+i)}}{cx}+\frac{3a\left(\arctan(ax)^2\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-2i\,\mathrm{polylog}\left(2,\frac{iax+1}{\sqrt{a^2x^2+1}}\right)\arctan(ax)-a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] -arctan(a*x)^3*(c*(a*x-I)*(I+a*x))^(1/2)/c/x+3*a*(arctan(a*x)^2*ln(1-(1+I*a
*x)/(a^2*x^2+1)^(1/2))-2*I*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*
x)-arctan(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*polylog(2,-(1+I*a*x)
/(a^2*x^2+1)^(1/2))*arctan(a*x)+2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*
polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*
x))^(1/2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)^3}{\sqrt{a^2cx^2+c}\,x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/(sqrt(a^2*c*x^2 + c)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}(a\,x)^3}{x^2\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{x^2\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**2/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**3/(x**2*sqrt(c*(a**2*x**2 + 1))), x)
```

3.442 $\int \frac{\tan^{-1}(ax)^3}{x^3\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=597

$$\frac{3ia^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(-\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ia^2\sqrt{a^2x^2+1}\,\text{Li}_2\left(\frac{\sqrt{iax+1}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{2\sqrt{a^2cx^2+c}}+\frac{3ia^2\cdots}{}$$

```
[Out] a^2*arctan(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a
^2*c*x^2+c)^(1/2)-6*a^2*arctan(a*x)*arctanh((1+I*a*x)^(1/2)/(1-I*a*x)^(1/2)
)*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3/2*I*a^2*arctan(a*x)^2*polylog(2,-
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3/2*I*a^
2*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a
^2*c*x^2+c)^(1/2)+3*I*a^2*polylog(2,-(1+I*a*x)^(1/2)/(1-I*a*x)^(1/2))*(a^2*
x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^2*polylog(2,(1+I*a*x)^(1/2)/(1-I*a*x
)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+3*a^2*arctan(a*x)*polylog(3,
-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3*a^2*a
rctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*
x^2+c)^(1/2)+3*I*a^2*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1
/2)/(a^2*c*x^2+c)^(1/2)-3*I*a^2*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2
*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-3/2*a*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c
/x-1/2*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/c/x^2
```

Rubi [A] time = 0.68, antiderivative size = 597, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4962, 4944, 4958, 4954, 4956, 4183, 2531, 6609, 2282, 6589}

$$\frac{3ia^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,-\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ia^2\sqrt{a^2x^2+1}\,\text{PolyLog}\left(2,\frac{\sqrt{1+iax}}{\sqrt{1-iax}}\right)}{\sqrt{a^2cx^2+c}}-\frac{3ia^2\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLo}\cdots}{2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-3*a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)/(2*c*x) - (Sqrt[c + a^2*c*x^2]*Arc
Tan[a*x]^3)/(2*c*x^2) + (a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*A
rcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (6*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Ar
cTanh[Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c*x^2] - (((3*I)/2)*a^
2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c +
a^2*c*x^2] + (((3*I)/2)*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, E^(I
*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((3*I)*a^2*Sqrt[1 + a^2*x^2]*PolyLog[
2, -(Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^2*Sq
rt[1 + a^2*x^2]*PolyLog[2, Sqrt[1 + I*a*x]/Sqrt[1 - I*a*x]])/Sqrt[c + a^2*c
*x^2] + (3*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])]
)/Sqrt[c + a^2*c*x^2] - (3*a^2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, E^(
I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((3*I)*a^2*Sqrt[1 + a^2*x^2]*PolyLog
[4, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - ((3*I)*a^2*Sqrt[1 + a^2*x^2]
*PolyLog[4, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4954

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]), x_
Symbol] :> Simp[(-2*(a + b*ArcTan[c*x])*ArcTanh[Sqrt[1 + I*c*x]/Sqrt[1 - I*
c*x]])/Sqrt[d], x] + (Simp[(I*b*PolyLog[2, -(Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x
])])/Sqrt[d], x] - Simp[(I*b*PolyLog[2, Sqrt[1 + I*c*x]/Sqrt[1 - I*c*x]])/S
qrt[d], x]) /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[d, 0]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
```

```
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^3\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}+\frac{1}{2}(3a)\int \frac{\tan^{-1}(ax)^2}{x^2\sqrt{c+a^2cx^2}}\,dx-\frac{1}{2}a^2\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}+\left(3a^2\right)\int \frac{\tan^{-1}(ax)}{x\sqrt{c+a^2cx^2}}\,dx-\frac{\left(a^2\right.}{}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}-\frac{\left(a^2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int x^3\,\text{csc}\right.}{2\sqrt{c+a^2cx^2}}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}+\frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-}}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}+\frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-}}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}+\frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-}}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}+\frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-}}{\sqrt{c+a^2cx^2}}$$

$$= -\frac{3a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{2cx^2}+\frac{a^2\sqrt{1+a^2x^2}\,\tan^{-1}(ax)^3\tanh^{-}}{\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 4.21, size = 345, normalized size = 0.58

$$\frac{a^2\sqrt{a^2x^2+1}\left(-24i\tan^{-1}(ax)^2\text{Li}_2\left(e^{-i\tan^{-1}(ax)}\right)-48\tan^{-1}(ax)\text{Li}_3\left(e^{-i\tan^{-1}(ax)}\right)+48\tan^{-1}(ax)\text{Li}_3\left(-e^{i\tan^{-1}(ax)}\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (a^2*Sqrt[1 + a^2*x^2]*(I*Pi^4 - (2*I)*ArcTan[a*x]^4 - 12*ArcTan[a*x]^2*Cot
[ArcTan[a*x]/2] - 2*ArcTan[a*x]^3*Csc[ArcTan[a*x]/2]^2 - 8*ArcTan[a*x]^3*Lo
g[1 - E^((-I)*ArcTan[a*x])] + 48*ArcTan[a*x]*Log[1 - E^(I*ArcTan[a*x])] - 4
8*ArcTan[a*x]*Log[1 + E^(I*ArcTan[a*x])] + 8*ArcTan[a*x]^3*Log[1 + E^(I*Arc
Tan[a*x])] - (24*I)*ArcTan[a*x]^2*PolyLog[2, E^((-I)*ArcTan[a*x])] - (24*I)
*(-2 + ArcTan[a*x]^2)*PolyLog[2, -E^(I*ArcTan[a*x])] - (48*I)*PolyLog[2, E^
(I*ArcTan[a*x])] - 48*ArcTan[a*x]*PolyLog[3, E^((-I)*ArcTan[a*x])] + 48*Arc
Tan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] + (48*I)*PolyLog[4, E^((-I)*ArcTan[
```

```
a*x])] + (48*I)*PolyLog[4, -E^(I*ArcTan[a*x])] + 2*ArcTan[a*x]^3*Sec[ArcTan
[a*x]/2]^2 - 12*ArcTan[a*x]^2*Tan[ArcTan[a*x]/2]))/(16*Sqrt[c*(1 + a^2*x^2)
])
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\arctan(ax)^3}{a^2cx^5+cx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^2*c*x^5 + c*x^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.60, size = 410, normalized size = 0.69

$$-\frac{(3ax+\arctan(ax))\arctan(ax)^2\sqrt{c(ax-i)(ax+i)}}{2x^2c}+\frac{ia^2\left(i\arctan(ax)^3\ln\left(1-\frac{iax+1}{\sqrt{a^2x^2+1}}\right)-i\arctan(ax)^3\ln\left(1\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^(1/2),x)
[Out] -1/2*(3*a*x+arctan(a*x))*arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/x^2/c+1/2*
I*a^2*(I*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3-I*ln(1+(1+I*a*x)/(
a^2*x^2+1)^(1/2))*arctan(a*x)^3-6*I*arctan(a*x)*ln(1-(1+I*a*x)/(a^2*x^2+1)^
(1/2))+3*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*polylog(3
,(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)+6*I*arctan(a*x)*ln(1+(1+I*a*x)/(a
^2*x^2+1)^(1/2))-3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*
I*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)-6*polylog(2,(1+I*a*x)
/(a^2*x^2+1)^(1/2))-6*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(2,-(
1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))*(c*(
a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)^3}{\sqrt{a^2cx^2+c}\,x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(arctan(a*x)^3/(sqrt(a^2*c*x^2 + c)*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}(a\,x)^3}{x^3\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(atan(a*x)^3/(x^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{x^3\sqrt{c(a^2x^2+1)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**3/(x**3*sqrt(c*(a**2*x**2 + 1))), x)
```

3.443 $\int \frac{\tan^{-1}(ax)^3}{x^4\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=396

$$\frac{2a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{3cx}-\frac{a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}{cx}-\frac{a\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}{2cx^2}-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{3cx^3}-\frac{5ia^3\sqrt{a^2}}{}$$

```
[Out] -a^3*arctanh((a^2*c*x^2+c)^(1/2)/c^(1/2))/c^(1/2)+5*a^3*arctan(a*x)^2*arcta
nh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5*I*a
^3*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a
^2*c*x^2+c)^(1/2)+5*I*a^3*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2)
)*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)+5*a^3*polylog(3,-(1+I*a*x)/(a^2*x^2
+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-5*a^3*polylog(3,(1+I*a*x)/
(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/(a^2*c*x^2+c)^(1/2)-a^2*arctan(a*x)*(a
^2*c*x^2+c)^(1/2)/c/x-1/2*a*arctan(a*x)^2*(a^2*c*x^2+c)^(1/2)/c/x^2-1/3*arc
tan(a*x)^3*(a^2*c*x^2+c)^(1/2)/c/x^3+2/3*a^2*arctan(a*x)^3*(a^2*c*x^2+c)^(1
/2)/c/x
```

Rubi [A] time = 0.99, antiderivative size = 396, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4962, 4944, 266, 63, 208, 4958, 4956, 4183, 2531, 2282, 6589}

$$-\frac{5ia^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{5ia^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2cx^2+c}}+\frac{5a^3\sqrt{a^2x^2}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((a^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])/(c*x)) - (a*Sqrt[c + a^2*c*x^2]*Arc
Tan[a*x]^2)/(2*c*x^2) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(3*c*x^3) + (2*
a^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(3*c*x) + (5*a^3*Sqrt[1 + a^2*x^2]*A
rcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] - (a^3*ArcTanh
[Sqrt[c + a^2*c*x^2]/Sqrt[c]])/Sqrt[c] - ((5*I)*a^3*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^2] + ((5*I)*a^3*Sqr
t[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])])/Sqrt[c + a^2*c*x^
2] + (5*a^3*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])])/Sqrt[c + a^2*
c*x^2] - (5*a^3*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/Sqrt[c + a
^2*c*x^2]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4962

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/Sqrt[(d_)
+ (e_.)*(x_)^2], x_Symbol] :> Simp[((f*x)^(m + 1)*Sqrt[d + e*x^2]*(a + b*Ar
cTan[c*x])^p)/(d*f*(m + 1)), x] + (-Dist[(b*c*p)/(f*(m + 1)), Int[((f*x)^(m
 + 1)*(a + b*ArcTan[c*x])^(p - 1))/Sqrt[d + e*x^2], x], x] - Dist[(c^2*(m +
 2))/(f^2*(m + 1)), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/Sqrt[d + e*x^
2], x], x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d] && GtQ[p, 0] &
& LtQ[m, -1] && NeQ[m, -2]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^4\sqrt{c+a^2cx^2}}\,dx = -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + a\int \frac{\tan^{-1}(ax)^2}{x^3\sqrt{c+a^2cx^2}}\,dx - \frac{1}{3}\left(2a^2\right)\int \frac{\tan^{-1}(ax)^3}{x^2\sqrt{c+a^2cx^2}}\,dx$$

$$= -\frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + \frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx} + a^2\int$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + \frac{2a^2\sqrt{c+}}{}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + \frac{2a^2\sqrt{c+}}{}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + \frac{2a^2\sqrt{c+}}{}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + \frac{2a^2\sqrt{c+}}{}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + \frac{2a^2\sqrt{c+}}{}$$

$$= -\frac{a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}{cx} - \frac{a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}{2cx^2} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{3cx^3} + \frac{2a^2\sqrt{c+}}{}$$

Mathematica [A] time = 6.51, size = 343, normalized size = 0.87

$$\frac{a^3\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{ax\tan^{-1}(ax)^3\csc^4\left(\frac{1}{2}\tan^{-1}(ax)\right)}{2\sqrt{a^2x^2+1}} - \frac{8\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^3\sin^4\left(\frac{1}{2}\tan^{-1}(ax)\right)}{a^3x^3} - 120i\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (a^3*Sqrt[c*(1 + a^2*x^2)]*(-12*ArcTan[a*x]*Cot[ArcTan[a*x]/2] + 10*ArcTan[
a*x]^3*Cot[ArcTan[a*x]/2] - 3*ArcTan[a*x]^2*Csc[ArcTan[a*x]/2]^2 - (a*x*Arc
Tan[a*x]^3*Csc[ArcTan[a*x]/2]^4)/(2*Sqrt[1 + a^2*x^2]) - 60*ArcTan[a*x]^2*L
og[1 - E^(I*ArcTan[a*x])] + 60*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] + 2
4*Log[Tan[ArcTan[a*x]/2]] - (120*I)*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x
])] + (120*I)*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] + 120*PolyLog[3, -E
^(I*ArcTan[a*x])] - 120*PolyLog[3, E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]^2*Sec
[ArcTan[a*x]/2]^2 - (8*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^3*Sin[ArcTan[a*x]/2]
^4)/(a^3*x^3) - 12*ArcTan[a*x]*Tan[ArcTan[a*x]/2] + 10*ArcTan[a*x]^3*Tan[Ar
cTan[a*x]/2]))/(24*c*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan\left(ax\right)^3}{a^2cx^6+cx^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^2*c*x^6 + c*x^4), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.95, size = 487, normalized size = 1.23

$$\frac{\left(4\arctan\left(ax\right)^2x^2a^2-6a^2x^2-3\arctan\left(ax\right)xa-2\arctan\left(ax\right)^2\right)\arctan\left(ax\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{6c\,x^3}-\frac{2a^3\,\text{arctanh}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^(1/2),x)
[Out] 1/6*(4*arctan(a*x)^2*x^2*a^2-6*a^2*x^2-3*arctan(a*x)*x*a-2*arctan(a*x)^2)*a
rctan(a*x)*(c*(a*x-I)*(I+a*x))^(1/2)/c/x^3-2*a^3*arctanh((1+I*a*x)/(a^2*x^2
+1)^(1/2))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c-5/2*a^3*ln(1-(1+I*
a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)
^(1/2)/c+5*I*a^3*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)/(a^2*x^
2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c-5*a^3*polylog(3,(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c+5/2*a^3*ln(1+(1+I*a*
x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(
1/2)/c-5*I*a^3*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)/(a^2*x^2
+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c+5*a^3*polylog(3,-(1+I*a*x)/(a^2*x^2+1
)^(1/2))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan\left(ax\right)^3}{\sqrt{a^2cx^2+c}\,x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(arctan(a*x)^3/(sqrt(a^2*c*x^2 + c)*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\text{atan}\left(a\,x\right)^3}{x^4\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^3/(x^4*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{x^4\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**4/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**3/(x**4*sqrt(c*(a**2*x**2 + 1))), x)
```

3.444 $\int \frac{x^3 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=403

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{a^4c^2}-\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^4c\sqrt{a^2cx^2+c}}+\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a^4c\sqrt{a^2cx^2+c}}+6\sqrt{\ }$$

```
[Out] 6*x/a^3/c/(a^2*c*x^2+c)^(1/2)-6*arctan(a*x)/a^4/c/(a^2*c*x^2+c)^(1/2)-3*x*a
rctan(a*x)^2/a^3/c/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^3/a^4/c/(a^2*c*x^2+c)^(1
/2)+6*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)
/a^4/c/(a^2*c*x^2+c)^(1/2)-6*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/c/(a^2*c*x^2+c)^(1/2)+6*I*arctan(a*x)*polyl
og(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/c/(a^2*c*x^2+c)^(
1/2)+6*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^4/c/(a
^2*c*x^2+c)^(1/2)-6*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1
/2)/a^4/c/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^4/c^2
```

Rubi [A] time = 0.52, antiderivative size = 403, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4964, 4930, 4890, 4888, 4181, 2531, 2282, 6589, 4898, 191}

$$-\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^4c\sqrt{a^2cx^2+c}}+\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^4c\sqrt{a^2cx^2+c}}+\frac{6\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (6*x)/(a^3*c*Sqrt[c + a^2*c*x^2]) - (6*ArcTan[a*x])/(a^4*c*Sqrt[c + a^2*c*x
^2]) - (3*x*ArcTan[a*x]^2)/(a^3*c*Sqrt[c + a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^
2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^4*c*Sqrt[c + a^2*c*x^2])
 + ArcTan[a*x]^3/(a^4*c*Sqrt[c + a^2*c*x^2]) + (Sqrt[c + a^2*c*x^2]*ArcTan[
a*x]^3)/(a^4*c^2) - ((6*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*E^
(I*ArcTan[a*x])])/(a^4*c*Sqrt[c + a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2]*Ar
cTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^4*c*Sqrt[c + a^2*c*x^2]) + (6
*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a^4*c*Sqrt[c + a^2*
c*x^2]) - (6*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^4*c*Sqrt
[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
```

```
1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx = -\frac{\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}dx}{a^2} + \frac{\int \frac{x\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}dx}{a^2c}$$

$$= \frac{\tan^{-1}(ax)^3}{a^4c\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^4c^2} - \frac{3\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}dx}{a^3} - \frac{3\int \frac{\tan^{-1}(ax)^2}{\sqrt{c+a^2cx^2}}dx}{a^3c}$$

$$= -\frac{6\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}} - \frac{3x\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^3}{a^4c\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{a^4c^2} + \frac{6\int \cdots}{\cdots}$$

$$= \frac{6x}{a^3c\sqrt{c+a^2cx^2}} - \frac{6\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}} - \frac{3x\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}(ax)^3}{a^4c\sqrt{c+a^2cx^2}} + \frac{\sqrt{c+a^2cx^2}\,\tan\cdots}{a^4c^2}$$

$$= \frac{6x}{a^3c\sqrt{c+a^2cx^2}} - \frac{6\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}} - \frac{3x\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} + \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\mathrm{ta}\cdots}{a^4c\sqrt{c+a^2cx^2}}$$

$$= \frac{6x}{a^3c\sqrt{c+a^2cx^2}} - \frac{6\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}} - \frac{3x\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} + \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\mathrm{ta}\cdots}{a^4c\sqrt{c+a^2cx^2}}$$

$$= \frac{6x}{a^3c\sqrt{c+a^2cx^2}} - \frac{6\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}} - \frac{3x\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} + \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\mathrm{ta}\cdots}{a^4c\sqrt{c+a^2cx^2}}$$

$$= \frac{6x}{a^3c\sqrt{c+a^2cx^2}} - \frac{6\tan^{-1}(ax)}{a^4c\sqrt{c+a^2cx^2}} - \frac{3x\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} + \frac{6i\sqrt{1+a^2x^2}\,\tan^{-1}\left(e^{i\tan^{-1}(ax)}\right)\mathrm{ta}\cdots}{a^4c\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.89, size = 308, normalized size = 0.76

$$\sqrt{a^2x^2+1}\left(\frac{6ax}{\sqrt{a^2x^2+1}} + \frac{3}{2}\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^3 - \frac{3ax\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}} - 3\sqrt{a^2x^2+1}\,\tan^{-1}(ax) + \frac{1}{2}\sqrt{a^2x^2+1}\,\tan^{-1}(ax\cdots\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*((6*a*x)/Sqrt[1 + a^2*x^2] - 3*Sqrt[1 + a^2*x^2]*ArcTan[
a*x] - (3*a*x*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] + (3*Sqrt[1 + a^2*x^2]*ArcTa
n[a*x]^3)/2 - 3*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Cos[2*ArcTan[a*x]] + (Sqrt[1
+ a^2*x^2]*ArcTan[a*x]^3*Cos[2*ArcTan[a*x]])/2 - 3*ArcTan[a*x]^2*Log[1 - I*
E^(I*ArcTan[a*x])] + 3*ArcTan[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] - (6*I)*A
rcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (6*I)*ArcTan[a*x]*PolyLog[2
, I*E^(I*ArcTan[a*x])] + 6*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] - 6*PolyLog[3
, I*E^(I*ArcTan[a*x])]))/(a^4*c*Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3\arctan(ax)^3}{a^4c^2x^4+2\,a^2c^2x^2+c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3*arctan(a*x)^3/(a^4*c^2*x^4 + 2*a^2*c^2*x^2
 + c^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 3.35, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(a x\right)^{3}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(a x\right)^{3}}{{\left(a^{2} c x^{2} + c\right)}^{\frac{3}{2}}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^3}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \operatorname{atan}^{3}{\left(a x \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**3/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**3*atan(a*x)**3/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.445 $\int \frac{x^2 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}} dx$

Optimal. Leaf size=495

$$-\frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{a^2cx^2+c}}+\frac{6x\tan^{-1}(ax)}{a^2c\sqrt{a^2cx^2+c}}+\frac{3i\sqrt{a^2x^2+1}\ \tan^{-1}(ax)^2\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\ \tan^{-1}(ax)^2\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}$$

```
[Out] 6/a^3/c/(a^2*c*x^2+c)^(1/2)+6*x*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(1/2)-3*arc
tan(a*x)^2/a^3/c/(a^2*c*x^2+c)^(1/2)-x*arctan(a*x)^3/a^2/c/(a^2*c*x^2+c)^(1
/2)-2*I*arctan((1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)
/a^3/c/(a^2*c*x^2+c)^(1/2)+3*I*arctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^
2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)-3*I*arctan(a*x)^2*p
olylog(2,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+
c)^(1/2)-6*arctan(a*x)*polylog(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1
)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)+6*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*
x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)-6*I*polylog(4,-I*
(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)+6*
I*polylog(4,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x
^2+c)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 495, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4964, 4890, 4888, 4181, 2531, 6609, 2282, 6589, 4898, 4894}

$$\frac{3i\sqrt{a^2x^2+1}\ \tan^{-1}(ax)^2\mathrm{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\ \tan^{-1}(ax)^2\mathrm{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] 6/(a^3*c*Sqrt[c + a^2*c*x^2]) + (6*x*ArcTan[a*x])/(a^2*c*Sqrt[c + a^2*c*x^2
]) - (3*ArcTan[a*x]^2)/(a^3*c*Sqrt[c + a^2*c*x^2]) - (x*ArcTan[a*x]^3)/(a^2
*c*Sqrt[c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])
]*ArcTan[a*x]^3)/(a^3*c*Sqrt[c + a^2*c*x^2]) + ((3*I)*Sqrt[1 + a^2*x^2]*Arc
Tan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^3*c*Sqrt[c + a^2*c*x^2])
- ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/(
a^3*c*Sqrt[c + a^2*c*x^2]) - (6*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-
I)*E^(I*ArcTan[a*x])])/(a^3*c*Sqrt[c + a^2*c*x^2]) + (6*Sqrt[1 + a^2*x^2]*A
rcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^3*c*Sqrt[c + a^2*c*x^2]) - (
(6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/(a^3*c*Sqrt[c +
 a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])])/(a
^3*c*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] && !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] && !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
```

```
1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
```

```
d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx = -\frac{\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2} + \frac{\int \frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx}{a^2c}$$

$$= -\frac{3\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}} + \frac{6\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2} + \frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^3}{\sqrt{1+a^2x^2}}\,dx}{a^2c\sqrt{c+a^2cx^2}}$$

$$= \frac{6}{a^3c\sqrt{c+a^2cx^2}} + \frac{6x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} - \frac{3\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\ \mathrm{Sub}}{}$$

$$= \frac{6}{a^3c\sqrt{c+a^2cx^2}} + \frac{6x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} - \frac{3\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\ \mathrm{ta}}{a}$$

$$= \frac{6}{a^3c\sqrt{c+a^2cx^2}} + \frac{6x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} - \frac{3\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\ \mathrm{ta}}{a}$$

$$= \frac{6}{a^3c\sqrt{c+a^2cx^2}} + \frac{6x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} - \frac{3\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\ \mathrm{ta}}{a}$$

$$= \frac{6}{a^3c\sqrt{c+a^2cx^2}} + \frac{6x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} - \frac{3\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\ \mathrm{ta}}{a}$$

$$= \frac{6}{a^3c\sqrt{c+a^2cx^2}} + \frac{6x\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}} - \frac{3\tan^{-1}(ax)^2}{a^3c\sqrt{c+a^2cx^2}} - \frac{x\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}} - \frac{2i\sqrt{1+a^2x^2}\ \mathrm{ta}}{a}$$

Mathematica [A] time = 1.75, size = 639, normalized size = 1.29

$$-\frac{\sqrt{a^2x^2+1}\left(-\frac{384}{\sqrt{a^2x^2+1}} + \frac{64ax\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}} + \frac{192\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}} - \frac{384ax\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} - 192i\tan^{-1}(ax)^2\mathrm{Li}_2\left(-ie^{-i\tan^{-1}(ax)}\right) - 192\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -1/64*(Sqrt[1 + a^2*x^2]*((7*I)*Pi^4 - 384/Sqrt[1 + a^2*x^2] + (8*I)*Pi^3*A
rcTan[a*x] - (384*a*x*ArcTan[a*x])/Sqrt[1 + a^2*x^2] - (24*I)*Pi^2*ArcTan[a
*x]^2 + (192*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] + (32*I)*Pi*ArcTan[a*x]^3 + (
64*a*x*ArcTan[a*x]^3)/Sqrt[1 + a^2*x^2] - (16*I)*ArcTan[a*x]^4 - 48*Pi^2*Ar
cTan[a*x]*Log[1 - I/E^(I*ArcTan[a*x])] + 96*Pi*ArcTan[a*x]^2*Log[1 - I/E^(I
*ArcTan[a*x])] + 8*Pi^3*Log[1 + I/E^(I*ArcTan[a*x])] - 64*ArcTan[a*x]^3*Log
[1 + I/E^(I*ArcTan[a*x])] - 8*Pi^3*Log[1 + I*E^(I*ArcTan[a*x])] + 48*Pi^2*A
rcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] - 96*Pi*ArcTan[a*x]^2*Log[1 + I*E^(
I*ArcTan[a*x])] + 64*ArcTan[a*x]^3*Log[1 + I*E^(I*ArcTan[a*x])] - 8*Pi^3*Lo
g[Tan[(Pi + 2*ArcTan[a*x])/4]] - (192*I)*ArcTan[a*x]^2*PolyLog[2, (-I)/E^(I
*ArcTan[a*x])] - (48*I)*Pi*(Pi - 4*ArcTan[a*x])*PolyLog[2, I/E^(I*ArcTan[a*
x])] - (48*I)*Pi^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] + (192*I)*Pi*ArcTan[a
*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (192*I)*ArcTan[a*x]^2*PolyLog[2, (
-I)*E^(I*ArcTan[a*x])] - 384*ArcTan[a*x]*PolyLog[3, (-I)/E^(I*ArcTan[a*x])]
 + 192*Pi*PolyLog[3, I/E^(I*ArcTan[a*x])] - 192*Pi*PolyLog[3, (-I)*E^(I*Arc
Tan[a*x])] + 384*ArcTan[a*x]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + (384*I)*P
```

```
olyLog[4, (-I)/E^(I*ArcTan[a*x])] + (384*I)*PolyLog[4, (-I)*E^(I*ArcTan[a*x
])]))/(a^3*c*Sqrt[c*(1 + a^2*x^2)])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2\arctan(ax)^3}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)^3/(a^4*c^2*x^4 + 2*a^2*c^2*x^2
 + c^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 3.40, size = 0, normalized size = 0.00

$$\int \frac{x^2\arctan(ax)^3}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\arctan(ax)^3}{\left(a^2cx^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2 + c)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,\mathrm{atan}(a\,x)^3}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\,\mathrm{atan}^3(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**3/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**3/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.446 $\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=107

$$-\frac{6x}{ac\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^3}{a^2c\sqrt{a^2cx^2+c}}+\frac{3x\tan^{-1}(ax)^2}{ac\sqrt{a^2cx^2+c}}+\frac{6\tan^{-1}(ax)}{a^2c\sqrt{a^2cx^2+c}}$$

```
[Out] -6*x/a/c/(a^2*c*x^2+c)^(1/2)+6*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(1/2)+3*x*ar
ctan(a*x)^2/a/c/(a^2*c*x^2+c)^(1/2)-arctan(a*x)^3/a^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4930, 4898, 191}

$$-\frac{6x}{ac\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^3}{a^2c\sqrt{a^2cx^2+c}}+\frac{3x\tan^{-1}(ax)^2}{ac\sqrt{a^2cx^2+c}}+\frac{6\tan^{-1}(ax)}{a^2c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (-6*x)/(a*c*Sqrt[c + a^2*c*x^2]) + (6*ArcTan[a*x])/(a^2*c*Sqrt[c + a^2*c*x^
2]) + (3*x*ArcTan[a*x]^2)/(a*c*Sqrt[c + a^2*c*x^2]) - ArcTan[a*x]^3/(a^2*c*
Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx &= -\frac{\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}}+\frac{3\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a}\\
&= \frac{6\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}}+\frac{3x\tan^{-1}(ax)^2}{ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}}-\frac{6\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a}\\
&= -\frac{6x}{ac\sqrt{c+a^2cx^2}}+\frac{6\tan^{-1}(ax)}{a^2c\sqrt{c+a^2cx^2}}+\frac{3x\tan^{-1}(ax)^2}{ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^3}{a^2c\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [A] time = 0.10, size = 61, normalized size = 0.57

$$\frac{\sqrt{a^2cx^2+c}\left(-6ax-\tan^{-1}(ax)^3+3ax\tan^{-1}(ax)^2+6\tan^{-1}(ax)\right)}{a^2c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-6*a*x + 6*ArcTan[a*x] + 3*a*x*ArcTan[a*x]^2 - ArcTan
[a*x]^3))/(a^2*c^2*(1 + a^2*x^2))
```

fricas [A] time = 0.42, size = 62, normalized size = 0.58

$$\frac{\sqrt{a^2cx^2+c}\left(3\,ax\arctan\left(ax\right)^2-\arctan\left(ax\right)^3-6\,ax+6\,\arctan\left(ax\right)\right)}{a^4c^2x^2+a^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(a^2*c*x^2 + c)*(3*a*x*arctan(a*x)^2 - arctan(a*x)^3 - 6*a*x + 6*arctan
(a*x))/(a^4*c^2*x^2 + a^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.12, size = 134, normalized size = 1.25

$$-\frac{\left(\arctan\left(ax\right)^3-6\arctan\left(ax\right)+3i\arctan\left(ax\right)^2-6i\right)\left(iax+1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^2x^2+1\right)c^2a^2}+\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(iax-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*(arctan(a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(1+I*a*x)*(c*(a*x-
I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2/a^2+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a
*x)*(arctan(a*x)^3-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)/(a^2*x^2+1)/c^2/a^2
```

maxima [A] time = 0.89, size = 98, normalized size = 0.92

$$\sqrt{c}\left(\frac{3\,x\arctan\left(ax\right)^2}{\sqrt{a^2x^2+1}\,ac^2}-\frac{\arctan\left(ax\right)^3}{\sqrt{a^2x^2+1}\,a^2c^2}-\frac{6\left(\frac{x}{\sqrt{a^2x^2+1}}-\frac{\arctan(ax)}{\sqrt{a^2x^2+1}\,a}\right)}{ac^2}\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] sqrt(c)*(3*x*arctan(a*x)^2/(sqrt(a^2*x^2 + 1)*a*c^2) - arctan(a*x)^3/(sqrt(
a^2*x^2 + 1)*a^2*c^2) - 6*(x/sqrt(a^2*x^2 + 1) - arctan(a*x)/(sqrt(a^2*x^2
+ 1)*a))/(a*c^2))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^3}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{atan}^{3}{\left(a x \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**3/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x*atan(a*x)**3/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.447 $\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=100

$$-\frac{6}{ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^3}{c\sqrt{a^2cx^2+c}}+\frac{3\tan^{-1}(ax)^2}{ac\sqrt{a^2cx^2+c}}-\frac{6x\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}$$

```
[Out] -6/a/c/(a^2*c*x^2+c)^(1/2)-6*x*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)+3*arctan(a
*x)^2/a/c/(a^2*c*x^2+c)^(1/2)+x*arctan(a*x)^3/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {4898, 4894}

$$-\frac{6}{ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^3}{c\sqrt{a^2cx^2+c}}+\frac{3\tan^{-1}(ax)^2}{ac\sqrt{a^2cx^2+c}}-\frac{6x\tan^{-1}(ax)}{c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -6/(a*c*Sqrt[c + a^2*c*x^2]) - (6*x*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2]) +
(3*ArcTan[a*x]^2)/(a*c*Sqrt[c + a^2*c*x^2]) + (x*ArcTan[a*x]^3)/(c*Sqrt[c +
 a^2*c*x^2])
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx&=\frac{3\tan^{-1}(ax)^2}{ac\sqrt{c+a^2cx^2}}+\frac{x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}-6\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/2}}\,dx\\&=-\frac{6}{ac\sqrt{c+a^2cx^2}}-\frac{6x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}+\frac{3\tan^{-1}(ax)^2}{ac\sqrt{c+a^2cx^2}}+\frac{x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}\end{aligned}$$

Mathematica [A] time = 0.08, size = 56, normalized size = 0.56

$$\frac{\sqrt{a^2cx^2+c}\left(ax\tan^{-1}(ax)^3+3\tan^{-1}(ax)^2-6ax\tan^{-1}(ax)-6\right)}{c^2\left(a^3x^2+a\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^3/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-6 - 6*a*x*ArcTan[a*x] + 3*ArcTan[a*x]^2 + a*x*ArcTan
[a*x]^3))/(c^2*(a + a^3*x^2))
```

fricas [A] time = 0.41, size = 58, normalized size = 0.58

$$\frac{\sqrt{a^2cx^2+c}\left(ax\arctan\left(ax\right)^3-6\,ax\arctan\left(ax\right)+3\,\arctan\left(ax\right)^2-6\right)}{a^3c^2x^2+ac^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] sqrt(a^2*c*x^2 + c)*(a*x*arctan(a*x)^3 - 6*a*x*arctan(a*x) + 3*arctan(a*x)^
2 - 6)/(a^3*c^2*x^2 + a*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.58, size = 132, normalized size = 1.32

$$\frac{\left(\arctan\left(ax\right)^3-6\arctan\left(ax\right)+3i\arctan\left(ax\right)^2-6i\right)\left(ax-i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^2x^2+1\right)c^2a}+\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(ax+i\right)\left(\mathrm{ar}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(arctan(a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(a*x-I)*(c*(a*x-I)*
(I+a*x))^(1/2)/(a^2*x^2+1)/c^2/a+1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arc
tan(a*x)^3-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)/(a^2*x^2+1)/c^2/a
```

maxima [A] time = 0.72, size = 99, normalized size = 0.99

$$\frac{x\arctan\left(ax\right)^3}{\sqrt{a^2cx^2+c}\,c}-\frac{3\,a\left(\frac{2\,x\arctan(ax)}{\sqrt{a^2x^2+1}\,ac}-\frac{\arctan(ax)^2}{\sqrt{a^2x^2+1}\,a^2c}+\frac{2}{\sqrt{a^2x^2+1}\,a^2c}\right)}{\sqrt{c}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] x*arctan(a*x)^3/(sqrt(a^2*c*x^2 + c)*c) - 3*a*(2*x*arctan(a*x)/(sqrt(a^2*x^
2 + 1)*a*c) - arctan(a*x)^2/(sqrt(a^2*x^2 + 1)*a^2*c) + 2/(sqrt(a^2*x^2 + 1
)*a^2*c))/sqrt(c)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^3/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/(a**2*c*x**2+c)**(3/2),x)
[Out] Integral(atan(a*x)**3/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.448 $\int \frac{\tan^{-1}(ax)^3}{x(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=443

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_3\left(-e^{i}\right.}{c\sqrt{a^2cx^2+c}}$$

```
[Out] 6*a*x/c/(a^2*c*x^2+c)^(1/2)-6*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)-3*a*x*arcta
n(a*x)^2/c/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^3/c/(a^2*c*x^2+c)^(1/2)-2*arctan
(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2
+c)^(1/2)+3*I*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^
2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-3*I*arctan(a*x)^2*polylog(2,(1+I*a*x)/(a^2
*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-6*arctan(a*x)*polylo
g(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)+6
*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^
2*c*x^2+c)^(1/2)-6*I*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1
/2)/c/(a^2*c*x^2+c)^(1/2)+6*I*polylog(4,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x
^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.56, antiderivative size = 443, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4966, 4958, 4956, 4183, 2531, 6609, 2282, 6589, 4930, 4898, 191}

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+1}\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (6*a*x)/(c*Sqrt[c + a^2*c*x^2]) - (6*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2]) -
 (3*a*x*ArcTan[a*x]^2)/(c*Sqrt[c + a^2*c*x^2]) + ArcTan[a*x]^3/(c*Sqrt[c +
a^2*c*x^2]) - (2*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*ArcTan[a*x])]
)/(c*Sqrt[c + a^2*c*x^2]) + ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[
2, -E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) - ((3*I)*Sqrt[1 + a^2*x^2]*
ArcTan[a*x]^2*PolyLog[2, E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) - (6*S
qrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^
2*c*x^2]) + (6*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, E^(I*ArcTan[a*x])])
/(c*Sqrt[c + a^2*c*x^2]) - ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, -E^(I*ArcTan
[a*x])])/(c*Sqrt[c + a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, E^(I
*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}-(3a)\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{3/2}}\,dx+\frac{\sqrt{1+a^2x^2}\int \frac{\tan^{-1}(ax)^3}{x\sqrt{1+a^2x^2}}\,dx}{c\sqrt{c+a^2cx^2}}$$

$$= -\frac{6\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{3ax\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}+(6a)\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}}\,dx+\frac{\sqrt{1+a^2x}}{}$$

$$= \frac{6ax}{c\sqrt{c+a^2cx^2}}-\frac{6\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{3ax\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}-\frac{2\sqrt{1+a^2x^2}\tan^{-1}(ax)^3}{c\sqrt{c+a}}$$

$$= \frac{6ax}{c\sqrt{c+a^2cx^2}}-\frac{6\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{3ax\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}-\frac{2\sqrt{1+a^2x^2}\tan^{-1}(ax)^3}{c\sqrt{c+a}}$$

$$= \frac{6ax}{c\sqrt{c+a^2cx^2}}-\frac{6\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{3ax\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}-\frac{2\sqrt{1+a^2x^2}\tan^{-1}(ax)^3}{c\sqrt{c+a}}$$

$$= \frac{6ax}{c\sqrt{c+a^2cx^2}}-\frac{6\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{3ax\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}-\frac{2\sqrt{1+a^2x^2}\tan^{-1}(ax)^3}{c\sqrt{c+a}}$$

$$= \frac{6ax}{c\sqrt{c+a^2cx^2}}-\frac{6\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}}-\frac{3ax\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}}+\frac{\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}}-\frac{2\sqrt{1+a^2x^2}\tan^{-1}(ax)^3}{c\sqrt{c+a}}$$

Mathematica [A] time = 0.47, size = 295, normalized size = 0.67

$$\frac{\sqrt{a^2x^2+1}\left(\frac{48ax}{\sqrt{a^2x^2+1}}+\frac{8\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}}-\frac{24ax\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}}-\frac{48\tan^{-1}(ax)}{\sqrt{a^2x^2+1}}+24i\tan^{-1}(ax)^2\text{Li}_2\left(e^{-i\tan^{-1}(ax)}\right)+24i\tan^{-1}(ax)^2\text{Li}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*((-I)*Pi^4 + (48*a*x)/Sqrt[1 + a^2*x^2] - (48*ArcTan[a*x
])/Sqrt[1 + a^2*x^2] - (24*a*x*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] + (8*ArcTan
[a*x]^3)/Sqrt[1 + a^2*x^2] + (2*I)*ArcTan[a*x]^4 + 8*ArcTan[a*x]^3*Log[1 -
E^((-I)*ArcTan[a*x])] - 8*ArcTan[a*x]^3*Log[1 + E^(I*ArcTan[a*x])] + (24*I)
*ArcTan[a*x]^2*PolyLog[2, E^((-I)*ArcTan[a*x])] + (24*I)*ArcTan[a*x]^2*Poly
Log[2, -E^(I*ArcTan[a*x])] + 48*ArcTan[a*x]*PolyLog[3, E^((-I)*ArcTan[a*x])
] - 48*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] - (48*I)*PolyLog[4, E^((-
I)*ArcTan[a*x])] - (48*I)*PolyLog[4, -E^(I*ArcTan[a*x])]))/(8*c*Sqrt[c*(1 +
 a^2*x^2)])
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{a^4c^2x^5+2\,a^2c^2x^3+c^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c
^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.98, size = 388, normalized size = 0.88

$$\frac{\left(\arctan\left(ax\right)^{3}-6\arctan\left(ax\right)+3i\arctan\left(ax\right)^{2}-6i\right)\left(iax+1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\left(a^{2}x^{2}+1\right)c^{2}}-\frac{\sqrt{c\left(ax-i\right)\left(ax+i\right)}\ \left(iax-\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] 1/2*(arctan(a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(1+I*a*x)*(c*(a*x-I
)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2-1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(
arctan(a*x)^3-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)/(a^2*x^2+1)/c^2+I*(I*arc
tan(a*x)^3*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)^3*ln(1-(1+I*a*x)
/(a^2*x^2+1)^(1/2))+3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))
+6*I*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)^2*po
lylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(3,(1+I*a*x)/(a
^2*x^2+1)^(1/2))-6*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(4,(1+I
*a*x)/(a^2*x^2+1)^(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{3}}{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^(3/2)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{3}{\left(ax \right)}}{x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**3/(x*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.449 $\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=377

$$-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{c^2x}+\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-$$

```
[Out] 6*a/c/(a^2*c*x^2+c)^(1/2)+6*a^2*x*arctan(a*x)/c/(a^2*c*x^2+c)^(1/2)-3*a*arc
tan(a*x)^2/c/(a^2*c*x^2+c)^(1/2)-a^2*x*arctan(a*x)^3/c/(a^2*c*x^2+c)^(1/2)-
6*a*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/
(a^2*c*x^2+c)^(1/2)+6*I*a*arctan(a*x)*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2
))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-6*I*a*arctan(a*x)*polylog(2,(1+I
*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-6*a*polylo
g(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)+6
*a*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)
^(1/2)-arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/c^2/x
```

Rubi [A] time = 0.58, antiderivative size = 377, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 10, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.417, Rules used = {4966, 4944, 4958, 4956, 4183, 2531, 2282, 6589, 4898, 4894}

$$\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{6a\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (6*a)/(c*Sqrt[c + a^2*c*x^2]) + (6*a^2*x*ArcTan[a*x])/(c*Sqrt[c + a^2*c*x^2
]) - (3*a*ArcTan[a*x]^2)/(c*Sqrt[c + a^2*c*x^2]) - (a^2*x*ArcTan[a*x]^3)/(c
*Sqrt[c + a^2*c*x^2]) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(c^2*x) - (6*a*
Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2
*c*x^2]) + ((6*I)*a*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a
*x])])/(c*Sqrt[c + a^2*c*x^2]) - ((6*I)*a*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Pol
yLog[2, E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) - (6*a*Sqrt[1 + a^2*x^2
]*PolyLog[3, -E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2]) + (6*a*Sqrt[1 + a
^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x])])/(c*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
```

```
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^3}{x^2\sqrt{c+a^2cx^2}}\,dx}{c}$$

$$= -\frac{3a\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^3}{c^2x} + \left(6a^2\right)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{3/}}$$

$$= \frac{6a}{c\sqrt{c+a^2cx^2}} + \frac{6a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{3a\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan}{c^2x}$$

$$= \frac{6a}{c\sqrt{c+a^2cx^2}} + \frac{6a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{3a\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan}{c^2x}$$

$$= \frac{6a}{c\sqrt{c+a^2cx^2}} + \frac{6a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{3a\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan}{c^2x}$$

$$= \frac{6a}{c\sqrt{c+a^2cx^2}} + \frac{6a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{3a\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan}{c^2x}$$

$$= \frac{6a}{c\sqrt{c+a^2cx^2}} + \frac{6a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{3a\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan}{c^2x}$$

$$= \frac{6a}{c\sqrt{c+a^2cx^2}} + \frac{6a^2x\tan^{-1}(ax)}{c\sqrt{c+a^2cx^2}} - \frac{3a\tan^{-1}(ax)^2}{c\sqrt{c+a^2cx^2}} - \frac{a^2x\tan^{-1}(ax)^3}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{c+a^2cx^2}\,\tan}{c^2x}$$

Mathematica [A] time = 1.60, size = 301, normalized size = 0.80

$$\frac{a\left(12i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) - 12i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right) - 12\sqrt{a^2x^2+1}\,\mathrm{Li}_3\left(-e^{i\tan}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] (a*(12 + 12*a*x*ArcTan[a*x] - 6*ArcTan[a*x]^2 - 2*a*x*ArcTan[a*x]^3 - (a*x*
ArcTan[a*x]^3*Csc[ArcTan[a*x]/2]^2)/2 + 6*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*L
og[1 - E^(I*ArcTan[a*x])] - 6*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Log[1 + E^(I*
ArcTan[a*x])] + (12*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTa
n[a*x])] - (12*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x]
)] - 12*Sqrt[1 + a^2*x^2]*PolyLog[3, -E^(I*ArcTan[a*x])] + 12*Sqrt[1 + a^2*
x^2]*PolyLog[3, E^(I*ArcTan[a*x])] - (2*(1 + a^2*x^2)*ArcTan[a*x]^3*Sin[Arc
Tan[a*x]/2]^2)/(a*x)))/(2*c*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{a^4c^2x^6+2\,a^2c^2x^4+c^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c
^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.99, size = 356, normalized size = 0.94

$$-\frac{a\left(\arctan(ax)^3-6\arctan(ax)+3i\arctan(ax)^2-6i\right)(ax-i)\sqrt{c(ax-i)(ax+i)}}{2\left(a^2x^2+1\right)c^2}-\frac{\sqrt{c(ax-i)(ax+i)}\ (ax+i)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] -1/2*a*(arctan(a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(a*x-I)*(c*(a*x-
I)*(I+a*x))^(1/2)/(a^2*x^2+1)/c^2-1/2*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(ar
ctan(a*x)^3-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)*a/(a^2*x^2+1)/c^2-arctan(a
*x)^3*(c*(a*x-I)*(I+a*x))^(1/2)/x/c^2+3*a*(arctan(a*x)^2*ln(1-(1+I*a*x)/(a^
2*x^2+1)^(1/2))-2*I*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)-arct
an(a*x)^2*ln(1+(1+I*a*x)/(a^2*x^2+1)^(1/2))+2*I*polylog(2,-(1+I*a*x)/(a^2*x
^2+1)^(1/2))*arctan(a*x)+2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog
(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/
2)/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^3}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^(3/2)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}(a\,x)^3}{x^2\,\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{x^2\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**3/(x**2*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.450 $\int \frac{x^5 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=534

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{a^6c^3}-\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^6c^2\sqrt{a^2cx^2+c}}+\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{a^6c^2\sqrt{a^2cx^2+c}}+\frac{6\sqrt{}}{}$$

```
[Out] 2/27*x^3/a^3/c/(a^2*c*x^2+c)^(3/2)-2/9*x^2*arctan(a*x)/a^4/c/(a^2*c*x^2+c)^
(3/2)-1/3*x^3*arctan(a*x)^2/a^3/c/(a^2*c*x^2+c)^(3/2)+1/3*x^2*arctan(a*x)^3
/a^4/c/(a^2*c*x^2+c)^(3/2)+94/9*x/a^5/c^2/(a^2*c*x^2+c)^(1/2)-94/9*arctan(a
*x)/a^6/c^2/(a^2*c*x^2+c)^(1/2)-5*x*arctan(a*x)^2/a^5/c^2/(a^2*c*x^2+c)^(1/
2)+5/3*arctan(a*x)^3/a^6/c^2/(a^2*c*x^2+c)^(1/2)+6*I*arctan((1+I*a*x)/(a^2*
x^2+1)^(1/2))*arctan(a*x)^2*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2+c)^(1/2)-6
*I*arctan(a*x)*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/
a^6/c^2/(a^2*c*x^2+c)^(1/2)+6*I*arctan(a*x)*polylog(2,I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2+c)^(1/2)+6*polylog(3,-I*(1+I
*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2+c)^(1/2)-6*po
lylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2
+c)^(1/2)+arctan(a*x)^3*(a^2*c*x^2+c)^(1/2)/a^6/c^3
```

Rubi [A] time = 1.11, antiderivative size = 534, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4964, 4930, 4890, 4888, 4181, 2531, 2282, 6589, 4898, 191, 4940, 4938}

$$-\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^6c^2\sqrt{a^2cx^2+c}}+\frac{6i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^6c^2\sqrt{a^2cx^2+c}}+\frac{6\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (2*x^3)/(27*a^3*c*(c + a^2*c*x^2)^(3/2)) + (94*x)/(9*a^5*c^2*Sqrt[c + a^2*c
*x^2]) - (2*x^2*ArcTan[a*x])/(9*a^4*c*(c + a^2*c*x^2)^(3/2)) - (94*ArcTan[a
*x])/(9*a^6*c^2*Sqrt[c + a^2*c*x^2]) - (x^3*ArcTan[a*x]^2)/(3*a^3*c*(c + a^
2*c*x^2)^(3/2)) - (5*x*ArcTan[a*x]^2)/(a^5*c^2*Sqrt[c + a^2*c*x^2]) + ((6*I
)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan[a*x]^2)/(a^6*c^2*Sqrt[
c + a^2*c*x^2]) + (x^2*ArcTan[a*x]^3)/(3*a^4*c*(c + a^2*c*x^2)^(3/2)) + (5*
ArcTan[a*x]^3)/(3*a^6*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[c + a^2*c*x^2]*ArcTa
n[a*x]^3)/(a^6*c^3) - ((6*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, (-I)*
E^(I*ArcTan[a*x])])/(a^6*c^2*Sqrt[c + a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2
]*ArcTan[a*x]*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^6*c^2*Sqrt[c + a^2*c*x^2]
) + (6*Sqrt[1 + a^2*x^2]*PolyLog[3, (-I)*E^(I*ArcTan[a*x])])/(a^6*c^2*Sqrt[
c + a^2*c*x^2]) - (6*Sqrt[1 + a^2*x^2]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^
6*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
```

```
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4938

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(q_), x_Symbol] :> Simp[(b*(f*x)^m*(d + e*x^2)^(q + 1))/(c*d*m^2), x] +
 (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x)^(m - 2)*(d + e*x^2)^(q + 1)*(a +
b*ArcTan[c*x]), x], x] - Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*A
rcTan[c*x]))/(c^2*d*m), x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d
] && EqQ[m + 2*q + 2, 0] && LtQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{x^5 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\int \frac{x^3\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a^2} + \frac{\int \frac{x^3\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2c}$$

$$= -\frac{x^3\tan^{-1}(ax)^2}{3a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{x^2\tan^{-1}(ax)^3}{3a^4c\left(c+a^2cx^2\right)^{3/2}} + \frac{2\int \frac{x^3\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{3a^2} + \frac{\int \frac{x\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx}{a^4c^2} - \frac{2\int \frac{x\,\mathrm{t}}{(c+}}{}$$

$$= \frac{2x^3}{27a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{2x^2\tan^{-1}(ax)}{9a^4c\left(c+a^2cx^2\right)^{3/2}} - \frac{x^3\tan^{-1}(ax)^2}{3a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{x^2\tan^{-1}(ax)^3}{3a^4c\left(c+a^2cx^2\right)^{3/2}} + \frac{}{3}$$

$$= \frac{2x^3}{27a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{2x^2\tan^{-1}(ax)}{9a^4c\left(c+a^2cx^2\right)^{3/2}} - \frac{94\tan^{-1}(ax)}{9a^6c^2\sqrt{c+a^2cx^2}} - \frac{x^3\tan^{-1}(ax)^2}{3a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5x}{a^5c}$$

$$= \frac{2x^3}{27a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{94x}{9a^5c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^4c\left(c+a^2cx^2\right)^{3/2}} - \frac{94\tan^{-1}(ax)}{9a^6c^2\sqrt{c+a^2cx^2}} - \frac{x^3}{3a^3c}$$

$$= \frac{2x^3}{27a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{94x}{9a^5c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^4c\left(c+a^2cx^2\right)^{3/2}} - \frac{94\tan^{-1}(ax)}{9a^6c^2\sqrt{c+a^2cx^2}} - \frac{x^3}{3a^3c}$$

$$= \frac{2x^3}{27a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{94x}{9a^5c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^4c\left(c+a^2cx^2\right)^{3/2}} - \frac{94\tan^{-1}(ax)}{9a^6c^2\sqrt{c+a^2cx^2}} - \frac{x^3}{3a^3c}$$

$$= \frac{2x^3}{27a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{94x}{9a^5c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^4c\left(c+a^2cx^2\right)^{3/2}} - \frac{94\tan^{-1}(ax)}{9a^6c^2\sqrt{c+a^2cx^2}} - \frac{x^3}{3a^3c}$$

$$= \frac{2x^3}{27a^3c\left(c+a^2cx^2\right)^{3/2}} + \frac{94x}{9a^5c^2\sqrt{c+a^2cx^2}} - \frac{2x^2\tan^{-1}(ax)}{9a^4c\left(c+a^2cx^2\right)^{3/2}} - \frac{94\tan^{-1}(ax)}{9a^6c^2\sqrt{c+a^2cx^2}} - \frac{x^3}{3a^3c}$$

Mathematica [A] time = 2.87, size = 367, normalized size = 0.69

$$-\frac{\left(a^2x^2+1\right)^2\left(\frac{1296i\tan^{-1}(ax)\mathrm{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} - \frac{1296i\tan^{-1}(ax)\mathrm{Li}_2\left(ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} - \frac{1296\mathrm{Li}_3\left(-ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + \frac{1296\mathrm{Li}_3\left(ie^{i\tan^{-1}(ax)}\right)}{\sqrt{a^2x^2+1}} + \frac{648}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^5*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -1/216*((1 + a^2*x^2)^2*(1134*ArcTan[a*x] - 405*ArcTan[a*x]^3 + 1128*ArcTan
[a*x]*Cos[2*ArcTan[a*x]] - 180*ArcTan[a*x]^3*Cos[2*ArcTan[a*x]] - 6*ArcTan[
a*x]*Cos[4*ArcTan[a*x]] + 9*ArcTan[a*x]^3*Cos[4*ArcTan[a*x]] + (648*ArcTan[
a*x]^2*Log[1 - I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (648*ArcTan[a*x]^2
*Log[1 + I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + ((1296*I)*ArcTan[a*x]*Po
lyLog[2, (-I)*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - ((1296*I)*ArcTan[a*x]
*PolyLog[2, I*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] - (1296*PolyLog[3, (-I)
*E^(I*ArcTan[a*x])])/Sqrt[1 + a^2*x^2] + (1296*PolyLog[3, I*E^(I*ArcTan[a*x
])])/Sqrt[1 + a^2*x^2] - 1132*Sin[2*ArcTan[a*x]] + 558*ArcTan[a*x]^2*Sin[2*
ArcTan[a*x]] + 2*Sin[4*ArcTan[a*x]] - 9*ArcTan[a*x]^2*Sin[4*ArcTan[a*x]]))/
(a^6*c*(c*(1 + a^2*x^2))^(3/2))
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^5\arctan\left(ax\right)^3}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^5*arctan(a*x)^3/(a^6*c^3*x^6 + 3*a^4*c^3*x^4
 + 3*a^2*c^3*x^2 + c^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 5.80, size = 0, normalized size = 0.00

$$\int \frac{x^5\arctan\left(ax\right)^3}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^5*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5\arctan\left(ax\right)^3}{\left(a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^5*arctan(a*x)^3/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,\mathrm{atan}\left(a\,x\right)^3}{{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^5*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5\,\mathrm{atan}^3\left(ax\right)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*atan(a*x)**3/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**5*atan(a*x)**3/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.451 $\int \frac{x^4 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=622

$$-\frac{x^3\tan^{-1}(ax)^3}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{2x^3\tan^{-1}(ax)}{9a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(-ie^{i\tan^{-1}(ax)}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2}{a^5c^2\sqrt{a^2cx^2}}$$

```
[Out] -2/27/a^5/c/(a^2*c*x^2+c)^(3/2)+2/9*x^3*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(3/
2)-1/3*x^2*arctan(a*x)^2/a^3/c/(a^2*c*x^2+c)^(3/2)-1/3*x^3*arctan(a*x)^3/a^
2/c/(a^2*c*x^2+c)^(3/2)+68/9/a^5/c^2/(a^2*c*x^2+c)^(1/2)+22/3*x*arctan(a*x)
/a^4/c^2/(a^2*c*x^2+c)^(1/2)-11/3*arctan(a*x)^2/a^5/c^2/(a^2*c*x^2+c)^(1/2)
-x*arctan(a*x)^3/a^4/c^2/(a^2*c*x^2+c)^(1/2)-2*I*arctan((1+I*a*x)/(a^2*x^2+
1)^(1/2))*arctan(a*x)^3*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)+3*I*a
rctan(a*x)^2*polylog(2,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^
5/c^2/(a^2*c*x^2+c)^(1/2)-3*I*arctan(a*x)^2*polylog(2,I*(1+I*a*x)/(a^2*x^2+
1)^(1/2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)-6*arctan(a*x)*polyl
og(3,-I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c
)^(1/2)+6*arctan(a*x)*polylog(3,I*(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^
(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)-6*I*polylog(4,-I*(1+I*a*x)/(a^2*x^2+1)^(1
/2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)+6*I*polylog(4,I*(1+I*a*x
)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 1.00, antiderivative size = 622, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 15, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.625, Rules used = {4964, 4890, 4888, 4181, 2531, 6609, 2282, 6589, 4898, 4894, 4944, 4940, 4930, 266, 43}

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,-ie^{i\tan^{-1}(ax)}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,ie^{i\tan^{-1}(ax)}\right)}{a^5c^2\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -2/(27*a^5*c*(c + a^2*c*x^2)^(3/2)) + 68/(9*a^5*c^2*Sqrt[c + a^2*c*x^2]) +
(2*x^3*ArcTan[a*x])/(9*a^2*c*(c + a^2*c*x^2)^(3/2)) + (22*x*ArcTan[a*x])/(3
*a^4*c^2*Sqrt[c + a^2*c*x^2]) - (x^2*ArcTan[a*x]^2)/(3*a^3*c*(c + a^2*c*x^2
)^(3/2)) - (11*ArcTan[a*x]^2)/(3*a^5*c^2*Sqrt[c + a^2*c*x^2]) - (x^3*ArcTan
[a*x]^3)/(3*a^2*c*(c + a^2*c*x^2)^(3/2)) - (x*ArcTan[a*x]^3)/(a^4*c^2*Sqrt[
c + a^2*c*x^2]) - ((2*I)*Sqrt[1 + a^2*x^2]*ArcTan[E^(I*ArcTan[a*x])]*ArcTan
[a*x]^3)/(a^5*c^2*Sqrt[c + a^2*c*x^2]) + ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*
x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])])/(a^5*c^2*Sqrt[c + a^2*c*x^2]) - ((
3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, I*E^(I*ArcTan[a*x])])/(a^5*
c^2*Sqrt[c + a^2*c*x^2]) - (6*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, (-I)
*E^(I*ArcTan[a*x])])/(a^5*c^2*Sqrt[c + a^2*c*x^2]) + (6*Sqrt[1 + a^2*x^2]*A
rcTan[a*x]*PolyLog[3, I*E^(I*ArcTan[a*x])])/(a^5*c^2*Sqrt[c + a^2*c*x^2]) -
 ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, (-I)*E^(I*ArcTan[a*x])])/(a^5*c^2*Sqrt
[c + a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, I*E^(I*ArcTan[a*x])]
)/(a^5*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4181

```
Int[csc[(e_.) + Pi*(k_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol
] :> Simp[(-2*(c + d*x)^m*ArcTanh[E^(I*k*Pi)*E^(I*(e + f*x))])/f, x] + (-Di
st[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 - E^(I*k*Pi)*E^(I*(e + f*x))], x],
x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Log[1 + E^(I*k*Pi)*E^(I*(e + f*x))
], x], x]) /; FreeQ[{c, d, e, f}, x] && IntegerQ[2*k] && IGtQ[m, 0]
```

Rule 4888

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[1/(c*Sqrt[d]), Subst[Int[(a + b*x)^p*Sec[x], x], x, ArcTan[c
*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && GtQ
[d, 0]
```

Rule 4890

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/Sqrt[(d_) + (e_.)*(x_)^2], x_S
ymbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[c*x])^p
/Sqrt[1 + c^2*x^2], x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] &&
 IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\int \frac{x^2\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a^2} + \frac{\int \frac{x^2\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^2c}$$

$$= -\frac{x^3\tan^{-1}(ax)^3}{3a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{\int \frac{x^3\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a} + \frac{\int \frac{\tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}}\,dx}{a^4c^2} - \frac{\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{a^4c}$$

$$= \frac{2x^3\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^2}{3a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{3\tan^{-1}(ax)^2}{a^5c^2\sqrt{c+a^2cx^2}} - \frac{x^3\tan^{-1}(ax)^3}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{x\,\mathrm{ta}}{a^4c^2\sqrt{}}$$

$$= \frac{6}{a^5c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{6x\tan^{-1}(ax)}{a^4c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^2}{3a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{11\,\mathrm{tan}}{3a^5c^2\sqrt{c}}$$

$$= \frac{22}{3a^5c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x\tan^{-1}(ax)}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^2}{3a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{11\,\mathrm{t}}{3a^5c^2}$$

$$= -\frac{2}{27a^5c\left(c+a^2cx^2\right)^{3/2}} + \frac{68}{9a^5c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x\tan^{-1}(ax)}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= -\frac{2}{27a^5c\left(c+a^2cx^2\right)^{3/2}} + \frac{68}{9a^5c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x\tan^{-1}(ax)}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= -\frac{2}{27a^5c\left(c+a^2cx^2\right)^{3/2}} + \frac{68}{9a^5c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x\tan^{-1}(ax)}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= -\frac{2}{27a^5c\left(c+a^2cx^2\right)^{3/2}} + \frac{68}{9a^5c^2\sqrt{c+a^2cx^2}} + \frac{2x^3\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{22x\tan^{-1}(ax)}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

Mathematica [A] time = 2.92, size = 691, normalized size = 1.11

$$-\frac{\sqrt{c\left(a^2x^2+1\right)}\left(-\frac{12960}{\sqrt{a^2x^2+1}} + \frac{2160ax\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}} + \frac{6480\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}} - \frac{12960ax\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} - 5184i\tan^{-1}(ax)^2\mathrm{Li}_2\left(-ie^{-i\tan^{-1}(ax)}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -1/1728*(Sqrt[c*(1 + a^2*x^2)]*((189*I)*Pi^4 - 12960/Sqrt[1 + a^2*x^2] + (2
16*I)*Pi^3*ArcTan[a*x] - (12960*a*x*ArcTan[a*x])/Sqrt[1 + a^2*x^2] - (648*I
)*Pi^2*ArcTan[a*x]^2 + (6480*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] + (864*I)*Pi*
ArcTan[a*x]^3 + (2160*a*x*ArcTan[a*x]^3)/Sqrt[1 + a^2*x^2] - (432*I)*ArcTan
[a*x]^4 + 32*Cos[3*ArcTan[a*x]] - 144*ArcTan[a*x]^2*Cos[3*ArcTan[a*x]] - 12
96*Pi^2*ArcTan[a*x]*Log[1 - I/E^(I*ArcTan[a*x])] + 2592*Pi*ArcTan[a*x]^2*Lo
g[1 - I/E^(I*ArcTan[a*x])] + 216*Pi^3*Log[1 + I/E^(I*ArcTan[a*x])] - 1728*A
rcTan[a*x]^3*Log[1 + I/E^(I*ArcTan[a*x])] - 216*Pi^3*Log[1 + I*E^(I*ArcTan[
a*x])] + 1296*Pi^2*ArcTan[a*x]*Log[1 + I*E^(I*ArcTan[a*x])] - 2592*Pi*ArcTa
n[a*x]^2*Log[1 + I*E^(I*ArcTan[a*x])] + 1728*ArcTan[a*x]^3*Log[1 + I*E^(I*A
rcTan[a*x])] - 216*Pi^3*Log[Tan[(Pi + 2*ArcTan[a*x])/4]] - (5184*I)*ArcTan[
```

```
a*x]^2*PolyLog[2, (-I)/E^(I*ArcTan[a*x])] - (1296*I)*Pi*(Pi - 4*ArcTan[a*x]
)*PolyLog[2, I/E^(I*ArcTan[a*x])] - (1296*I)*Pi^2*PolyLog[2, (-I)*E^(I*ArcT
an[a*x])] + (5184*I)*Pi*ArcTan[a*x]*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - (5
184*I)*ArcTan[a*x]^2*PolyLog[2, (-I)*E^(I*ArcTan[a*x])] - 10368*ArcTan[a*x]
*PolyLog[3, (-I)/E^(I*ArcTan[a*x])] + 5184*Pi*PolyLog[3, I/E^(I*ArcTan[a*x]
)] - 5184*Pi*PolyLog[3, (-I)*E^(I*ArcTan[a*x])] + 10368*ArcTan[a*x]*PolyLog
[3, (-I)*E^(I*ArcTan[a*x])] + (10368*I)*PolyLog[4, (-I)/E^(I*ArcTan[a*x])]
+ (10368*I)*PolyLog[4, (-I)*E^(I*ArcTan[a*x])] + 96*ArcTan[a*x]*Sin[3*ArcTa
n[a*x]] - 144*ArcTan[a*x]^3*Sin[3*ArcTan[a*x]]))/(a^5*c^3*Sqrt[1 + a^2*x^2]
)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2 + c}\,x^4\arctan(ax)^3}{a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^4*arctan(a*x)^3/(a^6*c^3*x^6 + 3*a^4*c^3*x^4
 + 3*a^2*c^3*x^2 + c^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 3.31, size = 0, normalized size = 0.00

$$\int \frac{x^4\arctan(ax)^3}{\left(a^2c\,x^2 + c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^4*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4\arctan(ax)^3}{\left(a^2cx^2 + c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^4*arctan(a*x)^3/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\mathrm{atan}(a\,x)^3}{\left(c\,a^2\,x^2 + c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^4*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4 \operatorname{atan}^3(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**3/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**4*atan(a*x)**3/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.452 $\int \frac{x^3 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=237

$$-\frac{x^2\tan^{-1}(ax)^3}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{2x^2\tan^{-1}(ax)}{9a^2c\left(a^2cx^2+c\right)^{3/2}}-\frac{2x^3}{27ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\tan^{-1}(ax)^2}{3ac\left(a^2cx^2+c\right)^{3/2}}-\frac{2\tan^{-1}(ax)^3}{3a^4c^2\sqrt{a^2cx^2+c}}+\frac{40\,\mathrm{ta}}{9a^4c^2\sqrt{}}$$

```
[Out] -2/27*x^3/a/c/(a^2*c*x^2+c)^(3/2)+2/9*x^2*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(
3/2)+1/3*x^3*arctan(a*x)^2/a/c/(a^2*c*x^2+c)^(3/2)-1/3*x^2*arctan(a*x)^3/a^
2/c/(a^2*c*x^2+c)^(3/2)-40/9*x/a^3/c^2/(a^2*c*x^2+c)^(1/2)+40/9*arctan(a*x)
/a^4/c^2/(a^2*c*x^2+c)^(1/2)+2*x*arctan(a*x)^2/a^3/c^2/(a^2*c*x^2+c)^(1/2)-
2/3*arctan(a*x)^3/a^4/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 237, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4940, 4930, 4898, 191, 4938}

$$-\frac{40x}{9a^3c^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^2}{a^3c^2\sqrt{a^2cx^2+c}}-\frac{2\tan^{-1}(ax)^3}{3a^4c^2\sqrt{a^2cx^2+c}}+\frac{40\tan^{-1}(ax)}{9a^4c^2\sqrt{a^2cx^2+c}}-\frac{2x^3}{27ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\tan^{-1}(}{3ac\left(a^2cx^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-2*x^3)/(27*a*c*(c + a^2*c*x^2)^(3/2)) - (40*x)/(9*a^3*c^2*Sqrt[c + a^2*c*
x^2]) + (2*x^2*ArcTan[a*x])/(9*a^2*c*(c + a^2*c*x^2)^(3/2)) + (40*ArcTan[a*
x])/(9*a^4*c^2*Sqrt[c + a^2*c*x^2]) + (x^3*ArcTan[a*x]^2)/(3*a*c*(c + a^2*c
*x^2)^(3/2)) + (2*x*ArcTan[a*x]^2)/(a^3*c^2*Sqrt[c + a^2*c*x^2]) - (x^2*Arc
Tan[a*x]^3)/(3*a^2*c*(c + a^2*c*x^2)^(3/2)) - (2*ArcTan[a*x]^3)/(3*a^4*c^2*
Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4938

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_)*((d_) + (e_.)*(x_)
^2)^(q_), x_Symbol] :> Simp[(b*(f*x)^m*(d + e*x^2)^(q + 1))/(c*d*m^2), x] +
 (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x)^(m - 2)*(d + e*x^2)^(q + 1)*(a +
b*ArcTan[c*x]), x], x] - Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*A
```

```
rcTan[c*x]))/(c^2*d*m), x]) /; FreeQ[{a, b, c, d, e, f}, x] && EqQ[e, c^2*d
] && EqQ[m + 2*q + 2, 0] && LtQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3 \tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2 \tan^{-1}(ax)^3}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2}{3}\int \frac{x^3 \tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{2\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3a^2c}$$

$$= -\frac{2x^3}{27ac\left(c+a^2cx^2\right)^{3/2}} + \frac{2x^2\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{x^3\tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^3}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{}{3a}$$

$$= -\frac{2x^3}{27ac\left(c+a^2cx^2\right)^{3/2}} + \frac{2x^2\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{40\tan^{-1}(ax)}{9a^4c^2\sqrt{c+a^2cx^2}} + \frac{x^3\tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} + \frac{2}{a^3c}$$

$$= -\frac{2x^3}{27ac\left(c+a^2cx^2\right)^{3/2}} - \frac{40x}{9a^3c^2\sqrt{c+a^2cx^2}} + \frac{2x^2\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{40\tan^{-1}(ax)}{9a^4c^2\sqrt{c+a^2cx^2}} + \frac{x}{3ac}$$

Mathematica [A] time = 0.14, size = 104, normalized size = 0.44

$$\frac{\sqrt{a^2cx^2+c}\left(-2ax\left(61a^2x^2+60\right)-9\left(3a^2x^2+2\right)\tan^{-1}(ax)^3+9ax\left(7a^2x^2+6\right)\tan^{-1}(ax)^2+6\left(21a^2x^2+20\right)\tan^{-1}\right.}{27a^4c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-2*a*x*(60 + 61*a^2*x^2) + 6*(20 + 21*a^2*x^2)*ArcTan
[a*x] + 9*a*x*(6 + 7*a^2*x^2)*ArcTan[a*x]^2 - 9*(2 + 3*a^2*x^2)*ArcTan[a*x]
^3))/(27*a^4*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.41, size = 113, normalized size = 0.48

$$-\frac{\left(122\,a^3x^3+9\left(3\,a^2x^2+2\right)\arctan(ax)^3-9\left(7\,a^3x^3+6\,ax\right)\arctan(ax)^2+120\,ax-6\left(21\,a^2x^2+20\right)\arctan(ax)\right.}{27\left(a^8c^3x^4+2\,a^6c^3x^2+a^4c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/27*(122*a^3*x^3 + 9*(3*a^2*x^2 + 2)*arctan(a*x)^3 - 9*(7*a^3*x^3 + 6*a*x
)*arctan(a*x)^2 + 120*a*x - 6*(21*a^2*x^2 + 20)*arctan(a*x))*sqrt(a^2*c*x^2
 + c)/(a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 2.63, size = 312, normalized size = 1.32

$$-\frac{\left(9 i \arctan \left(a x\right)^{2}+9 \arctan \left(a x\right)^{3}-2 i-6 \arctan \left(a x\right)\right) \left(i x^{3} a^{3}+3 a^{2} x^{2}-3 i a x-1\right) \sqrt{c \left(a x-i\right) \left(a x+i\right)}}{216 \left(a^{2} x^{2}+1\right)^{2} c^{3} a^{4}}-\frac{3 \left(\mathrm{arc}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/216*(9*I*arctan(a*x)^2+9*arctan(a*x)^3-2*I-6*arctan(a*x))*(I*x^3*a^3+3*a
^2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3/a^4-3/8*(arct
an(a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(1+I*a*x)*(c*(a*x-I)*(I+a*x)
)^(1/2)/a^4/c^3/(a^2*x^2+1)+3/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arcta
n(a*x)^3-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)/a^4/c^3/(a^2*x^2+1)+1/216*(-9
*I*arctan(a*x)^2+9*arctan(a*x)^3+2*I-6*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/
2)*(I*x^3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(ax\right)^{3}}{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^3*arctan(a*x)^3/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^{3} \operatorname{atan}\left(a\,x\right)^{3}}{{\left(c\,a^{2}\,x^{2}+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^3*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \operatorname{atan}^{3}{\left(ax \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**3/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**3*atan(a*x)**3/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.453 $\int \frac{x^2 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=199

$$-\frac{4x\tan^{-1}(ax)}{3a^2c^2\sqrt{a^2cx^2+c}}+\frac{x^2\tan^{-1}(ax)^2}{3ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\tan^{-1}(ax)^3}{3c\left(a^2cx^2+c\right)^{3/2}}-\frac{2x^3\tan^{-1}(ax)}{9c\left(a^2cx^2+c\right)^{3/2}}-\frac{14}{9a^3c^2\sqrt{a^2cx^2+c}}+\frac{2\tan^{-1}(ax)^2}{3a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 2/27/a^3/c/(a^2*c*x^2+c)^(3/2)-2/9*x^3*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)+1/
3*x^2*arctan(a*x)^2/a/c/(a^2*c*x^2+c)^(3/2)+1/3*x^3*arctan(a*x)^3/c/(a^2*c*
x^2+c)^(3/2)-14/9/a^3/c^2/(a^2*c*x^2+c)^(1/2)-4/3*x*arctan(a*x)/a^2/c^2/(a^
2*c*x^2+c)^(1/2)+2/3*arctan(a*x)^2/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4944, 4940, 4930, 4894, 266, 43}

$$-\frac{14}{9a^3c^2\sqrt{a^2cx^2+c}}-\frac{4x\tan^{-1}(ax)}{3a^2c^2\sqrt{a^2cx^2+c}}+\frac{2\tan^{-1}(ax)^2}{3a^3c^2\sqrt{a^2cx^2+c}}+\frac{2}{27a^3c\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\tan^{-1}(ax)^3}{3c\left(a^2cx^2+c\right)^{3/2}}-\frac{2x^3\tan^{-1}(a}{9c\left(a^2cx^2+c\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] 2/(27*a^3*c*(c + a^2*c*x^2)^(3/2)) - 14/(9*a^3*c^2*Sqrt[c + a^2*c*x^2]) - (
2*x^3*ArcTan[a*x])/(9*c*(c + a^2*c*x^2)^(3/2)) - (4*x*ArcTan[a*x])/(3*a^2*c
^2*Sqrt[c + a^2*c*x^2]) + (x^2*ArcTan[a*x]^2)/(3*a*c*(c + a^2*c*x^2)^(3/2))
 + (2*ArcTan[a*x]^2)/(3*a^3*c^2*Sqrt[c + a^2*c*x^2]) + (x^3*ArcTan[a*x]^3)/
(3*c*(c + a^2*c*x^2)^(3/2))
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3 \tan^{-1}(ax)^3}{3c\left(c+a^2cx^2\right)^{3/2}} - a\int \frac{x^3 \tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

$$= -\frac{2x^3 \tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{x^2 \tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x^3 \tan^{-1}(ax)^3}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{1}{9}(2a)\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}}\,d$$

$$= -\frac{2x^3 \tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{x^2 \tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} + \frac{2\tan^{-1}(ax)^2}{3a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3 \tan^{-1}(ax)^3}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{1}{9}a\,\mathrm{S}$$

$$= -\frac{4}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{2x^3 \tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{4x\tan^{-1}(ax)}{3a^2c^2\sqrt{c+a^2cx^2}} + \frac{x^2 \tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} + \frac{2}{3a^3c}$$

$$= \frac{2}{27a^3c\left(c+a^2cx^2\right)^{3/2}} - \frac{14}{9a^3c^2\sqrt{c+a^2cx^2}} - \frac{2x^3 \tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{4x\tan^{-1}(ax)}{3a^2c^2\sqrt{c+a^2cx^2}} + \frac{x^{}}{3ac}$$

Mathematica [A] time = 0.11, size = 95, normalized size = 0.48

$$\frac{\sqrt{a^2cx^2+c}\left(9a^3x^3\tan^{-1}(ax)^3 - 42a^2x^2 + 9\left(3a^2x^2+2\right)\tan^{-1}(ax)^2 - 6ax\left(7a^2x^2+6\right)\tan^{-1}(ax) - 40\right)}{27a^3c^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-40 - 42*a^2*x^2 - 6*a*x*(6 + 7*a^2*x^2)*ArcTan[a*x]
+ 9*(2 + 3*a^2*x^2)*ArcTan[a*x]^2 + 9*a^3*x^3*ArcTan[a*x]^3))/(27*a^3*c^3*(
1 + a^2*x^2)^2)
```

fricas [A] time = 0.42, size = 106, normalized size = 0.53

$$\frac{\left(9\,a^3x^3\arctan\left(ax\right)^3 - 42\,a^2x^2 + 9\left(3\,a^2x^2+2\right)\arctan\left(ax\right)^2 - 6\left(7\,a^3x^3+6\,ax\right)\arctan\left(ax\right) - 40\right)\sqrt{a^2cx^2+c}}{27\left(a^7c^3x^4 + 2\,a^5c^3x^2 + a^3c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] 1/27*(9*a^3*x^3*arctan(a*x)^3 - 42*a^2*x^2 + 9*(3*a^2*x^2 + 2)*arctan(a*x)^
2 - 6*(7*a^3*x^3 + 6*a*x)*arctan(a*x) - 40)*sqrt(a^2*c*x^2 + c)/(a^7*c^3*x^
4 + 2*a^5*c^3*x^2 + a^3*c^3)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 2.56, size = 308, normalized size = 1.55

$$\frac{\left(9i\arctan\left(ax\right)^{2}+9\arctan\left(ax\right)^{3}-2i-6\arctan\left(ax\right)\right)\left(a^{3}x^{3}-3ix^{2}a^{2}-3ax+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^{2}x^{2}+1\right)^{2}c^{3}a^{3}}+\frac{\left(\arctan\left(ax\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/216*(9*I*arctan(a*x)^2+9*arctan(a*x)^3-2*I-6*arctan(a*x))*(a^3*x^3-3*I*x^
2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3/a^3+1/8*(arctan(
a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/
2)/a^3/c^3/(a^2*x^2+1)+1/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^3
-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)/a^3/c^3/(a^2*x^2+1)+1/216*(-9*I*arcta
n(a*x)^2+9*arctan(a*x)^3+2*I-6*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)*(a^3*
x^3+3*I*x^2*a^2-3*a*x-I)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\arctan\left(ax\right)^{3}}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x^2*arctan(a*x)^3/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^{2}\,\mathrm{atan}\left(a\,x\right)^{3}}{\left(c\,a^{2}\,x^{2}+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^2*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}\operatorname{atan}^{3}\left(ax\right)}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**3/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**3/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.454 $\int \frac{x \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}} \, dx$

Optimal. Leaf size=199

$$-\frac{40x}{27ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^2}{3ac^2\sqrt{a^2cx^2+c}}+\frac{4\tan^{-1}(ax)}{3a^2c^2\sqrt{a^2cx^2+c}}-\frac{2x}{27ac\left(a^2cx^2+c\right)^{3/2}}-\frac{\tan^{-1}(ax)^3}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax}{3ac\left(a^2cx^2+\right.}$$

```
[Out] -2/27*x/a/c/(a^2*c*x^2+c)^(3/2)+2/9*arctan(a*x)/a^2/c/(a^2*c*x^2+c)^(3/2)+1
/3*x*arctan(a*x)^2/a/c/(a^2*c*x^2+c)^(3/2)-1/3*arctan(a*x)^3/a^2/c/(a^2*c*x
^2+c)^(3/2)-40/27*x/a/c^2/(a^2*c*x^2+c)^(1/2)+4/3*arctan(a*x)/a^2/c^2/(a^2*
c*x^2+c)^(1/2)+2/3*x*arctan(a*x)^2/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4930, 4900, 4898, 191, 192}

$$-\frac{40x}{27ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^2}{3ac^2\sqrt{a^2cx^2+c}}+\frac{4\tan^{-1}(ax)}{3a^2c^2\sqrt{a^2cx^2+c}}-\frac{2x}{27ac\left(a^2cx^2+c\right)^{3/2}}-\frac{\tan^{-1}(ax)^3}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax}{3ac\left(a^2cx^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-2*x)/(27*a*c*(c + a^2*c*x^2)^(3/2)) - (40*x)/(27*a*c^2*Sqrt[c + a^2*c*x^2
]) + (2*ArcTan[a*x])/(9*a^2*c*(c + a^2*c*x^2)^(3/2)) + (4*ArcTan[a*x])/(3*a
^2*c^2*Sqrt[c + a^2*c*x^2]) + (x*ArcTan[a*x]^2)/(3*a*c*(c + a^2*c*x^2)^(3/2
)) + (2*x*ArcTan[a*x]^2)/(3*a*c^2*Sqrt[c + a^2*c*x^2]) - ArcTan[a*x]^3/(3*a
^2*c*(c + a^2*c*x^2)^(3/2))
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
```

```
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\tan^{-1}(ax)^3}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{a}$$

$$= \frac{2\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{x\tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}}-\frac{\tan^{-1}(ax)^3}{3a^2c\left(c+a^2cx^2\right)^{3/2}}-\frac{2\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{9a}+\frac{2\ldots}{}$$

$$= -\frac{2x}{27ac\left(c+a^2cx^2\right)^{3/2}}+\frac{2\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{4\tan^{-1}(ax)}{3a^2c^2\sqrt{c+a^2cx^2}}+\frac{x\tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}}+\ldots$$

$$= -\frac{2x}{27ac\left(c+a^2cx^2\right)^{3/2}}-\frac{40x}{27ac^2\sqrt{c+a^2cx^2}}+\frac{2\tan^{-1}(ax)}{9a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{4\tan^{-1}(ax)}{3a^2c^2\sqrt{c+a^2cx^2}}+\ldots$$

Mathematica [A] time = 0.11, size = 91, normalized size = 0.46

$$\frac{\sqrt{a^2cx^2+c}\left(-2ax\left(20a^2x^2+21\right)+9ax\left(2a^2x^2+3\right)\tan^{-1}(ax)^2+6\left(6a^2x^2+7\right)\tan^{-1}(ax)-9\tan^{-1}(ax)^3\right)}{27c^3\left(a^3x^2+a\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-2*a*x*(21 + 20*a^2*x^2) + 6*(7 + 6*a^2*x^2)*ArcTan[a
*x] + 9*a*x*(3 + 2*a^2*x^2)*ArcTan[a*x]^2 - 9*ArcTan[a*x]^3))/(27*c^3*(a +
a^3*x^2)^2)
```

fricas [A] time = 0.41, size = 103, normalized size = 0.52

$$-\frac{\left(40\,a^3x^3-9\left(2\,a^3x^3+3\,ax\right)\arctan\left(ax\right)^2+9\,\arctan\left(ax\right)^3+42\,ax-6\left(6\,a^2x^2+7\right)\arctan\left(ax\right)\right)\sqrt{a^2cx^2+c}}{27\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/27*(40*a^3*x^3 - 9*(2*a^3*x^3 + 3*a*x)*arctan(a*x)^2 + 9*arctan(a*x)^3 +
 42*a*x - 6*(6*a^2*x^2 + 7)*arctan(a*x))*sqrt(a^2*c*x^2 + c)/(a^6*c^3*x^4 +
 2*a^4*c^3*x^2 + a^2*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\mathit{sage}_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.99, size = 312, normalized size = 1.57

$$\frac{\left(9i\arctan\left(ax\right)^{2}+9\arctan\left(ax\right)^{3}-2i-6\arctan\left(ax\right)\right)\left(ix^{3}a^{3}+3a^{2}x^{2}-3iax-1\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^{2}x^{2}+1\right)^{2}c^{3}a^{2}}-\frac{\left(\arctan\left(a\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/216*(9*I*arctan(a*x)^2+9*arctan(a*x)^3-2*I-6*arctan(a*x))*(I*x^3*a^3+3*a^
2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3/a^2-1/8*(arcta
n(a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(1+I*a*x)*(c*(a*x-I)*(I+a*x))
^(1/2)/a^2/c^3/(a^2*x^2+1)+1/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan
(a*x)^3-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)/a^2/c^3/(a^2*x^2+1)-1/216*(-9*
I*arctan(a*x)^2+9*arctan(a*x)^3+2*I-6*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2
)*(I*x^3*a^3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\arctan\left(ax\right)^{3}}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(x*arctan(a*x)^3/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^{3}}{\left(c\,a^{2}\,x^{2}+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x*atan(a*x)^3)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\,\mathrm{atan}^{3}\left(ax\right)}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**3/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x*atan(a*x)**3/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.455 $\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=215

$$-\frac{40}{9ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^3}{3c^2\sqrt{a^2cx^2+c}}+\frac{2\tan^{-1}(ax)^2}{ac^2\sqrt{a^2cx^2+c}}-\frac{40x\tan^{-1}(ax)}{9c^2\sqrt{a^2cx^2+c}}-\frac{2}{27ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax)^3}{3c\left(a^2cx^2+c\right)^{3/2}}+$$

```
[Out] -2/27/a/c/(a^2*c*x^2+c)^(3/2)-2/9*x*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)+1/3*a
rctan(a*x)^2/a/c/(a^2*c*x^2+c)^(3/2)+1/3*x*arctan(a*x)^3/c/(a^2*c*x^2+c)^(3
/2)-40/9/a/c^2/(a^2*c*x^2+c)^(1/2)-40/9*x*arctan(a*x)/c^2/(a^2*c*x^2+c)^(1/
2)+2*arctan(a*x)^2/a/c^2/(a^2*c*x^2+c)^(1/2)+2/3*x*arctan(a*x)^3/c^2/(a^2*c
*x^2+c)^(1/2)
```

Rubi [A] time = 0.18, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {4900, 4898, 4894, 4896}

$$-\frac{40}{9ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^3}{3c^2\sqrt{a^2cx^2+c}}+\frac{2\tan^{-1}(ax)^2}{ac^2\sqrt{a^2cx^2+c}}-\frac{40x\tan^{-1}(ax)}{9c^2\sqrt{a^2cx^2+c}}-\frac{2}{27ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x\tan^{-1}(ax)^3}{3c\left(a^2cx^2+c\right)^{3/2}}+$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -2/(27*a*c*(c + a^2*c*x^2)^(3/2)) - 40/(9*a*c^2*Sqrt[c + a^2*c*x^2]) - (2*x
*ArcTan[a*x])/(9*c*(c + a^2*c*x^2)^(3/2)) - (40*x*ArcTan[a*x])/(9*c^2*Sqrt[
c + a^2*c*x^2]) + ArcTan[a*x]^2/(3*a*c*(c + a^2*c*x^2)^(3/2)) + (2*ArcTan[a
*x]^2)/(a*c^2*Sqrt[c + a^2*c*x^2]) + (x*ArcTan[a*x]^3)/(3*c*(c + a^2*c*x^2)
^(3/2)) + (2*x*ArcTan[a*x]^3)/(3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
```

```
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{\tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x\tan^{-1}(ax)^3}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{2}{3}\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{2\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3c}$$

$$= -\frac{2}{27ac\left(c+a^2cx^2\right)^{3/2}} - \frac{2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{\tan^{-1}(ax)^2}{3ac\left(c+a^2cx^2\right)^{3/2}} + \frac{2\tan^{-1}(ax)^2}{ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}}{3c\left(c+\right.}$$

$$= -\frac{2}{27ac\left(c+a^2cx^2\right)^{3/2}} - \frac{40}{9ac^2\sqrt{c+a^2cx^2}} - \frac{2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{40x\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} + \frac{\tan^{-1}}{3ac\left(c+\right.}$$

Mathematica [A] time = 0.10, size = 104, normalized size = 0.48

$$\frac{\sqrt{a^2cx^2+c}\left(-2\left(60a^2x^2+61\right)+9ax\left(2a^2x^2+3\right)\tan^{-1}(ax)^3+9\left(6a^2x^2+7\right)\tan^{-1}(ax)^2-6ax\left(20a^2x^2+21\right)\tan\right.}{27ac^3\left(a^2x^2+1\right)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^3/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*(-2*(61 + 60*a^2*x^2) - 6*a*x*(21 + 20*a^2*x^2)*ArcTan
[a*x] + 9*(7 + 6*a^2*x^2)*ArcTan[a*x]^2 + 9*a*x*(3 + 2*a^2*x^2)*ArcTan[a*x]
^3))/(27*a*c^3*(1 + a^2*x^2)^2)
```

fricas [A] time = 0.42, size = 111, normalized size = 0.52

$$-\frac{\sqrt{a^2cx^2+c}\left(120\,a^2x^2-9\left(2\,a^3x^3+3\,ax\right)\arctan\left(ax\right)^3-9\left(6\,a^2x^2+7\right)\arctan\left(ax\right)^2+6\left(20\,a^3x^3+21\,ax\right)\arctan\right.}{27\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] -1/27*sqrt(a^2*c*x^2 + c)*(120*a^2*x^2 - 9*(2*a^3*x^3 + 3*a*x)*arctan(a*x)^
3 - 9*(6*a^2*x^2 + 7)*arctan(a*x)^2 + 6*(20*a^3*x^3 + 21*a*x)*arctan(a*x) +
 122)/(a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.53, size = 308, normalized size = 1.43

$$-\frac{\left(9i\arctan\left(ax\right)^2+9\arctan\left(ax\right)^3-2i-6\arctan\left(ax\right)\right)\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{216\left(a^2x^2+1\right)^2ac^3}+\frac{3\left(\arctan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/216*(9*I*arctan(a*x)^2+9*arctan(a*x)^3-2*I-6*arctan(a*x))*(a^3*x^3-3*I*x
^2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/a/c^3+3/8*(arctan(a
*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/2
)/c^3/a/(a^2*x^2+1)+3/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^3-6*
arctan(a*x)-3*I*arctan(a*x)^2+6*I)/c^3/a/(a^2*x^2+1)-1/216*(-9*I*arctan(a*x
)^2+9*arctan(a*x)^3+2*I-6*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)*(a^3*x^3+3
*I*x^2*a^2-3*a*x-I)/(a^4*x^4+2*a^2*x^2+1)/a/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^3}{\left(a^2cx^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/(a^2*c*x^2 + c)^(5/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^3}{\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^3/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)**3/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.456 $\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=553

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_3\left(-e^{i}\right.}{c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 2/27*a*x/c/(a^2*c*x^2+c)^(3/2)-2/9*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)-1/3*a*
x*arctan(a*x)^2/c/(a^2*c*x^2+c)^(3/2)+1/3*arctan(a*x)^3/c/(a^2*c*x^2+c)^(3/
2)+202/27*a*x/c^2/(a^2*c*x^2+c)^(1/2)-22/3*arctan(a*x)/c^2/(a^2*c*x^2+c)^(1
/2)-11/3*a*x*arctan(a*x)^2/c^2/(a^2*c*x^2+c)^(1/2)+arctan(a*x)^3/c^2/(a^2*c
*x^2+c)^(1/2)-2*arctan(a*x)^3*arctanh((1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2
+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+3*I*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a
^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-3*I*arctan(a*x)^
2*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c
)^(1/2)-6*arctan(a*x)*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(
1/2)/c^2/(a^2*c*x^2+c)^(1/2)+6*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^
(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-6*I*polylog(4,-(1+I*a*x)/(
a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+6*I*polylog(4,(
1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.92, antiderivative size = 553, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 13, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.542, Rules used = {4966, 4958, 4956, 4183, 2531, 6609, 2282, 6589, 4930, 4898, 191, 4900, 192}

$$\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{3i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{6\sqrt{a^2x^2+1}\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] (2*a*x)/(27*c*(c + a^2*c*x^2)^(3/2)) + (202*a*x)/(27*c^2*Sqrt[c + a^2*c*x^2
]) - (2*ArcTan[a*x])/(9*c*(c + a^2*c*x^2)^(3/2)) - (22*ArcTan[a*x])/(3*c^2*
Sqrt[c + a^2*c*x^2]) - (a*x*ArcTan[a*x]^2)/(3*c*(c + a^2*c*x^2)^(3/2)) - (1
1*a*x*ArcTan[a*x]^2)/(3*c^2*Sqrt[c + a^2*c*x^2]) + ArcTan[a*x]^3/(3*c*(c +
a^2*c*x^2)^(3/2)) + ArcTan[a*x]^3/(c^2*Sqrt[c + a^2*c*x^2]) - (2*Sqrt[1 + a
^2*x^2]*ArcTan[a*x]^3*ArcTanh[E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2])
 + ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])])/(
c^2*Sqrt[c + a^2*c*x^2]) - ((3*I)*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*PolyLog[2
, E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) - (6*Sqrt[1 + a^2*x^2]*ArcT
an[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) + (6*Sqrt
[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[3, E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*
c*x^2]) - ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, -E^(I*ArcTan[a*x])])/(c^2*Sqr
t[c + a^2*c*x^2]) + ((6*I)*Sqrt[1 + a^2*x^2]*PolyLog[4, E^(I*ArcTan[a*x])])
/(c^2*Sqrt[c + a^2*c*x^2])
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
```

```
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
```

```
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rule 6609

```
Int[((e_.) + (f_.)*(x_))^(m_.)*PolyLog[n_, (d_.)*((F_)^((c_.)*((a_.) + (b_.
)*(x_))))^(p_.)], x_Symbol] :> Simp[((e + f*x)^m*PolyLog[n + 1, d*(F^(c*(a
+ b*x)))^p])/(b*c*p*Log[F]), x] - Dist[(f*m)/(b*c*p*Log[F]), Int[(e + f*x)^
(m - 1)*PolyLog[n + 1, d*(F^(c*(a + b*x)))^p], x], x] /; FreeQ[{F, a, b, c,
 d, e, f, n, p}, x] && GtQ[m, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^{5/2}}\,dx = -\left(a^2\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^3}{x\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= \frac{\tan^{-1}(ax)^3}{3c\left(c+a^2cx^2\right)^{3/2}} - a\int \frac{\tan^{-1}(ax)^2}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{\int \frac{\tan^{-1}(ax)^3}{x\sqrt{c+a^2cx^2}}\,dx}{c^2} - \frac{a^2\int \frac{x\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= -\frac{2\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{ax\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{\tan^{-1}(ax)^3}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{\tan^{-1}(ax)^3}{c^2\sqrt{c+a^2cx^2}} + \frac{1}{9}(2a)\int$$

$$= \frac{2ax}{27c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{ax\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{11ax\,\mathrm{ta}}{3c^2\sqrt{c}}$$

$$= \frac{2ax}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{202ax}{27c^2\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{ax\,\mathrm{tan}}{3c\left(c+\right.}$$

$$= \frac{2ax}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{202ax}{27c^2\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{ax\,\mathrm{tan}}{3c\left(c+\right.}$$

$$= \frac{2ax}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{202ax}{27c^2\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{ax\,\mathrm{tan}}{3c\left(c+\right.}$$

$$= \frac{2ax}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{202ax}{27c^2\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{ax\,\mathrm{tan}}{3c\left(c+\right.}$$

$$= \frac{2ax}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{202ax}{27c^2\sqrt{c+a^2cx^2}} - \frac{2\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{22\tan^{-1}(ax)}{3c^2\sqrt{c+a^2cx^2}} - \frac{ax\,\mathrm{tan}}{3c\left(c+\right.}$$

Mathematica [A] time = 0.86, size = 347, normalized size = 0.63

$$\left(a^2x^2+1\right)^{3/2}\left(\frac{1620ax}{\sqrt{a^2x^2+1}} + \frac{270\tan^{-1}(ax)^3}{\sqrt{a^2x^2+1}} - \frac{810ax\tan^{-1}(ax)^2}{\sqrt{a^2x^2+1}} - \frac{1620\tan^{-1}(ax)}{\sqrt{a^2x^2+1}} + 648i\tan^{-1}(ax)^2\mathrm{Li}_2\left(e^{-i\tan^{-1}(ax)}\right) + 648i\,\mathrm{t}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] ((1 + a^2*x^2)^(3/2)*((-27*I)*Pi^4 + (1620*a*x)/Sqrt[1 + a^2*x^2] - (1620*A
rcTan[a*x])/Sqrt[1 + a^2*x^2] - (810*a*x*ArcTan[a*x]^2)/Sqrt[1 + a^2*x^2] +
 (270*ArcTan[a*x]^3)/Sqrt[1 + a^2*x^2] + (54*I)*ArcTan[a*x]^4 - 12*ArcTan[a
*x]*Cos[3*ArcTan[a*x]] + 18*ArcTan[a*x]^3*Cos[3*ArcTan[a*x]] + 216*ArcTan[a
*x]^3*Log[1 - E^((-I)*ArcTan[a*x])] - 216*ArcTan[a*x]^3*Log[1 + E^(I*ArcTan
[a*x])] + (648*I)*ArcTan[a*x]^2*PolyLog[2, E^((-I)*ArcTan[a*x])] + (648*I)*
ArcTan[a*x]^2*PolyLog[2, -E^(I*ArcTan[a*x])] + 1296*ArcTan[a*x]*PolyLog[3,
E^((-I)*ArcTan[a*x])] - 1296*ArcTan[a*x]*PolyLog[3, -E^(I*ArcTan[a*x])] - (
1296*I)*PolyLog[4, E^((-I)*ArcTan[a*x])] - (1296*I)*PolyLog[4, -E^(I*ArcTan
[a*x])] + 4*Sin[3*ArcTan[a*x]] - 18*ArcTan[a*x]^2*Sin[3*ArcTan[a*x]]))/(216
*c*(c*(1 + a^2*x^2))^(3/2))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\arctan(ax)^3}{a^6c^3x^7+3a^4c^3x^5+3a^2c^3x^3+c^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3
*a^2*c^3*x^3 + c^3*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.88, size = 560, normalized size = 1.01

$$-\frac{\left(9i\arctan(ax)^2+9\arctan(ax)^3-2i-6\arctan(ax)\right)\left(ix^3a^3+3a^2x^2-3iax-1\right)\sqrt{c(ax-i)(ax+i)}}{216\left(a^2x^2+1\right)^2c^3}+\frac{5\left(\arctan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] -1/216*(9*I*arctan(a*x)^2+9*arctan(a*x)^3-2*I-6*arctan(a*x))*(I*x^3*a^3+3*a
^2*x^2-3*I*a*x-1)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3+5/8*(arctan(a
*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(1+I*a*x)*(c*(a*x-I)*(I+a*x))^(1
/2)/c^3/(a^2*x^2+1)-5/8*(c*(a*x-I)*(I+a*x))^(1/2)*(-1+I*a*x)*(arctan(a*x)^3
-6*arctan(a*x)-3*I*arctan(a*x)^2+6*I)/c^3/(a^2*x^2+1)+1/216*(-9*I*arctan(a*
x)^2+9*arctan(a*x)^3+2*I-6*arctan(a*x))*(c*(a*x-I)*(I+a*x))^(1/2)*(I*x^3*a^
3-3*a^2*x^2-3*I*a*x+1)/(a^4*x^4+2*a^2*x^2+1)/c^3+I*(I*arctan(a*x)^3*ln(1+(1
+I*a*x)/(a^2*x^2+1)^(1/2))-I*arctan(a*x)^3*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2)
)+3*arctan(a*x)^2*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*I*arctan(a*x)*p
olylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))-3*arctan(a*x)^2*polylog(2,(1+I*a*x)/
(a^2*x^2+1)^(1/2))-6*I*arctan(a*x)*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-6
*polylog(4,-(1+I*a*x)/(a^2*x^2+1)^(1/2))+6*polylog(4,(1+I*a*x)/(a^2*x^2+1)^
(1/2)))*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^(1/2)/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)^3}{\left(a^2cx^2+c\right)^{\frac{5}{2}}x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^(5/2)*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\operatorname{atan}(a\,x)^3}{x\,\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(atan(a*x)^3/(x*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{x\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x/(a**2*c*x**2+c)**(5/2),x)
[Out] Integral(atan(a*x)**3/(x*(c*(a**2*x**2 + 1))**(5/2)), x)
```

3.457 $\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=493

$$-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3}{c^3x}+\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(-e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Li}_2\left(e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{6a}{}$$

```
[Out] 2/27*a/c/(a^2*c*x^2+c)^(3/2)+2/9*a^2*x*arctan(a*x)/c/(a^2*c*x^2+c)^(3/2)-1/
3*a*arctan(a*x)^2/c/(a^2*c*x^2+c)^(3/2)-1/3*a^2*x*arctan(a*x)^3/c/(a^2*c*x^
2+c)^(3/2)+94/9*a/c^2/(a^2*c*x^2+c)^(1/2)+94/9*a^2*x*arctan(a*x)/c^2/(a^2*c
*x^2+c)^(1/2)-5*a*arctan(a*x)^2/c^2/(a^2*c*x^2+c)^(1/2)-5/3*a^2*x*arctan(a*
x)^3/c^2/(a^2*c*x^2+c)^(1/2)-6*a*arctan(a*x)^2*arctanh((1+I*a*x)/(a^2*x^2+1
)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+6*I*a*arctan(a*x)*polylo
g(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)
-6*I*a*arctan(a*x)*polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)
/c^2/(a^2*c*x^2+c)^(1/2)-6*a*polylog(3,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*(a^2*x
^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+6*a*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/
2))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-arctan(a*x)^3*(a^2*c*x^2+c)^(
1/2)/c^3/x
```

Rubi [A] time = 0.95, antiderivative size = 493, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 12, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4966, 4944, 4958, 4956, 4183, 2531, 2282, 6589, 4898, 4894, 4900, 4896}

$$\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,-e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{6ia\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{PolyLog}\left(2,e^{i\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{6a\sqrt{a^2x^2+1}}{c^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] (2*a)/(27*c*(c + a^2*c*x^2)^(3/2)) + (94*a)/(9*c^2*Sqrt[c + a^2*c*x^2]) + (
2*a^2*x*ArcTan[a*x])/(9*c*(c + a^2*c*x^2)^(3/2)) + (94*a^2*x*ArcTan[a*x])/(
9*c^2*Sqrt[c + a^2*c*x^2]) - (a*ArcTan[a*x]^2)/(3*c*(c + a^2*c*x^2)^(3/2))
- (5*a*ArcTan[a*x]^2)/(c^2*Sqrt[c + a^2*c*x^2]) - (a^2*x*ArcTan[a*x]^3)/(3*
c*(c + a^2*c*x^2)^(3/2)) - (5*a^2*x*ArcTan[a*x]^3)/(3*c^2*Sqrt[c + a^2*c*x^
2]) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3)/(c^3*x) - (6*a*Sqrt[1 + a^2*x^2]*
ArcTan[a*x]^2*ArcTanh[E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) + ((6*I
)*a*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])])/(c^2*Sqrt
[c + a^2*c*x^2]) - ((6*I)*a*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*PolyLog[2, E^(I*A
rcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) - (6*a*Sqrt[1 + a^2*x^2]*PolyLog[3,
 -E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2]) + (6*a*Sqrt[1 + a^2*x^2]*Po
lyLog[3, E^(I*ArcTan[a*x])])/(c^2*Sqrt[c + a^2*c*x^2])
```

Rule 2282

```
Int[u_, x_Symbol] :> With[{v = FunctionOfExponential[u, x]}, Dist[v/D[v, x]
, Subst[Int[FunctionOfExponentialFunction[u, x]/x, x], x, v], x]] /; Functi
onOfExponentialQ[u, x] &&  !MatchQ[u, (w_)*((a_.)*(v_)^(n_))^(m_) /; FreeQ[
{a, m, n}, x] && IntegerQ[m*n]] &&  !MatchQ[u, E^((c_.)*((a_.) + (b_.)*x))*
(F_)[v_] /; FreeQ[{a, b, c}, x] && InverseFunctionQ[F[x]]]
```

Rule 2531

```
Int[Log[1 + (e_.)*((F_)^((c_.)*((a_.) + (b_.)*(x_))))^(n_.)]*((f_.) + (g_.)
*(x_))^(m_.), x_Symbol] :> -Simp[((f + g*x)^m*PolyLog[2, -(e*(F^(c*(a + b*x
```

```
)))^n)])/(b*c*n*Log[F]), x] + Dist[(g*m)/(b*c*n*Log[F]), Int[(f + g*x)^(m -
 1)*PolyLog[2, -(e*(F^(c*(a + b*x)))^n)], x], x] /; FreeQ[{F, a, b, c, e, f
, g, n}, x] && GtQ[m, 0]
```

Rule 4183

```
Int[csc[(e_.) + (f_.)*(x_)]*((c_.) + (d_.)*(x_))^(m_.), x_Symbol] :> Simp[(
-2*(c + d*x)^m*ArcTanh[E^(I*(e + f*x))])/f, x] + (-Dist[(d*m)/f, Int[(c + d
*x)^(m - 1)*Log[1 - E^(I*(e + f*x))], x], x] + Dist[(d*m)/f, Int[(c + d*x)^
(m - 1)*Log[1 + E^(I*(e + f*x))], x], x]) /; FreeQ[{c, d, e, f}, x] && IGtQ
[m, 0]
```

Rule 4894

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)^2)^(3/2), x_Symbo
l] :> Simp[b/(c*d*Sqrt[d + e*x^2]), x] + Simp[(x*(a + b*ArcTan[c*x]))/(d*Sq
rt[d + e*x^2]), x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rule 4896

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol
] :> Simp[(b*(d + e*x^2)^(q + 1))/(4*c*d*(q + 1)^2), x] + (Dist[(2*q + 3)/(
2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]), x], x] - Simp[(x
*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*d*(q + 1)), x]) /; FreeQ[{a, b
, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && NeQ[q, -3/2]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4956

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2]
), x_Symbol] :> Dist[1/Sqrt[d], Subst[Int[(a + b*x)^p*Csc[x], x], x, ArcTan
[c*x]], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0] && G
```

```
tQ[d, 0]
```

Rule 4958

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*Sqrt[(d_) + (e_.)*(x_)^2
]), x_Symbol] :> Dist[Sqrt[1 + c^2*x^2]/Sqrt[d + e*x^2], Int[(a + b*ArcTan[
c*x])^p/(x*Sqrt[1 + c^2*x^2]), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e
, c^2*d] && IGtQ[p, 0] &&  !GtQ[d, 0]
```

Rule 4966

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/d, Int[x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*
x])^p, x], x] - Dist[e/d, Int[x^(m + 2)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^p
, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p, 2*q]
 && LtQ[q, -1] && ILtQ[m, 0] && NeQ[p, -1]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx = -\left(a^2\int \frac{\tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{5/2}}\,dx\right) + \frac{\int \frac{\tan^{-1}(ax)^3}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx}{c}$$

$$= -\frac{a\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{a^2x\tan^{-1}(ax)^3}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{1}{3}\left(2a^2\right)\int \frac{\tan^{-1}(ax)}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{\int \frac{\tan^{-1}(ax)^3}{x^2\sqrt{c+a^2cx^2}}}{c^2}$$

$$= \frac{2a}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{2a^2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} - \frac{a\tan^{-1}(ax)^2}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5a\tan^{-1}(ax)^2}{c^2\sqrt{c+a^2cx^2}} - \frac{a^2x\tan}{3c(c+}$$

$$= \frac{2a}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a}{9c^2\sqrt{c+a^2cx^2}} + \frac{2a^2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} - \frac{a\tan}{3c(c}$$

$$= \frac{2a}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a}{9c^2\sqrt{c+a^2cx^2}} + \frac{2a^2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} - \frac{a\tan}{3c(c}$$

$$= \frac{2a}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a}{9c^2\sqrt{c+a^2cx^2}} + \frac{2a^2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} - \frac{a\tan}{3c(c}$$

$$= \frac{2a}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a}{9c^2\sqrt{c+a^2cx^2}} + \frac{2a^2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} - \frac{a\tan}{3c(c}$$

$$= \frac{2a}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a}{9c^2\sqrt{c+a^2cx^2}} + \frac{2a^2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} - \frac{a\tan}{3c(c}$$

$$= \frac{2a}{27c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a}{9c^2\sqrt{c+a^2cx^2}} + \frac{2a^2x\tan^{-1}(ax)}{9c\left(c+a^2cx^2\right)^{3/2}} + \frac{94a^2x\tan^{-1}(ax)}{9c^2\sqrt{c+a^2cx^2}} - \frac{a\tan}{3c(c}$$

Mathematica [A] time = 2.65, size = 399, normalized size = 0.81

$$-\frac{a\left(-648i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(-e^{i\tan^{-1}(ax)}\right) + 648i\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\mathrm{Li}_2\left(e^{i\tan^{-1}(ax)}\right) + 648\sqrt{a^2x^2+1}\,\mathrm{Li}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^3/(x^2*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] -1/108*(a*(-1134 - 1134*a*x*ArcTan[a*x] + 567*ArcTan[a*x]^2 + 189*a*x*ArcTa
n[a*x]^3 - 2*Sqrt[1 + a^2*x^2]*Cos[3*ArcTan[a*x]] + 9*Sqrt[1 + a^2*x^2]*Arc
Tan[a*x]^2*Cos[3*ArcTan[a*x]] + 27*a*x*ArcTan[a*x]^3*Csc[ArcTan[a*x]/2]^2 -
 324*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*Log[1 - E^(I*ArcTan[a*x])] + 324*Sqrt[
1 + a^2*x^2]*ArcTan[a*x]^2*Log[1 + E^(I*ArcTan[a*x])] - (648*I)*Sqrt[1 + a^
2*x^2]*ArcTan[a*x]*PolyLog[2, -E^(I*ArcTan[a*x])] + (648*I)*Sqrt[1 + a^2*x^
2]*ArcTan[a*x]*PolyLog[2, E^(I*ArcTan[a*x])] + 648*Sqrt[1 + a^2*x^2]*PolyLo
g[3, -E^(I*ArcTan[a*x])] - 648*Sqrt[1 + a^2*x^2]*PolyLog[3, E^(I*ArcTan[a*x
])] - 6*Sqrt[1 + a^2*x^2]*ArcTan[a*x]*Sin[3*ArcTan[a*x]] + 9*Sqrt[1 + a^2*x
^2]*ArcTan[a*x]^3*Sin[3*ArcTan[a*x]] + 54*Sqrt[1 + a^2*x^2]*ArcTan[a*x]^3*T
an[ArcTan[a*x]/2]))/(c^2*Sqrt[c + a^2*c*x^2])
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,\arctan(ax)^3}{a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3/(a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3
*a^2*c^3*x^4 + c^3*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.84, size = 528, normalized size = 1.07

$$\frac{a\left(9i\arctan(ax)^2+9\arctan(ax)^3-2i-6\arctan(ax)\right)\left(a^3x^3-3ix^2a^2-3ax+i\right)\sqrt{c(ax-i)(ax+i)}}{216\left(a^2x^2+1\right)^2c^3}-\frac{7a\left(\arctan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] 1/216*a*(9*I*arctan(a*x)^2+9*arctan(a*x)^3-2*I-6*arctan(a*x))*(a^3*x^3-3*I*
x^2*a^2-3*a*x+I)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^2*x^2+1)^2/c^3-7/8*a*(arctan(
a*x)^3-6*arctan(a*x)+3*I*arctan(a*x)^2-6*I)*(a*x-I)*(c*(a*x-I)*(I+a*x))^(1/
2)/c^3/(a^2*x^2+1)-7/8*(c*(a*x-I)*(I+a*x))^(1/2)*(I+a*x)*(arctan(a*x)^3-6*a
rctan(a*x)-3*I*arctan(a*x)^2+6*I)*a/c^3/(a^2*x^2+1)+1/216*(c*(a*x-I)*(I+a*x
))^(1/2)*(a^3*x^3+3*I*x^2*a^2-3*a*x-I)*(-9*I*arctan(a*x)^2+9*arctan(a*x)^3+
2*I-6*arctan(a*x))*a/c^3/(a^4*x^4+2*a^2*x^2+1)-arctan(a*x)^3*(c*(a*x-I)*(I+
a*x))^(1/2)/x/c^3+3*a*(arctan(a*x)^2*ln(1-(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*I*
polylog(2,(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(a*x)-arctan(a*x)^2*ln(1+(1+I*
a*x)/(a^2*x^2+1)^(1/2))+2*I*polylog(2,-(1+I*a*x)/(a^2*x^2+1)^(1/2))*arctan(
a*x)+2*polylog(3,(1+I*a*x)/(a^2*x^2+1)^(1/2))-2*polylog(3,-(1+I*a*x)/(a^2*x
^2+1)^(1/2)))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(ax)^3}{\left(a^2cx^2+c\right)^{\frac{5}{2}}x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^3/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate(arctan(a*x)^3/((a^2*c*x^2 + c)^(5/2)*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\mathrm{atan}(a\,x)^3}{x^2\,\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(atan(a*x)^3/(x^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^3(ax)}{x^2\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**3/x**2/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)**3/(x**2*(c*(a**2*x**2 + 1))**(5/2)), x)
```

3.458 $\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^2 \tan^{-1}(ax)^3,x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^3,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^3, x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^3 \, dx=\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^3 \, dx$$

Mathematica [A] time = 2.12, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^3,x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^3, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4 c^2 x^4+2\,a^2 c^2 x^2+c^2\right) x^m \arctan\left(ax\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m*arctan(a*x)^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.54, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\,x^2+c\right)^2 \arctan\left(ax\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^3,x)

[Out] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^3,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{15}{2}\left(\left(a^4c^2m^2+4\,a^4c^2m+3\,a^4c^2\right)x^5+2\left(a^2c^2m^2+6\,a^2c^2m+5\,a^2c^2\right)x^3+\left(c^2m^2+8\,c^2m+15\,c^2\right)x\right)x^m\arctan(a$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^3,x, algorithm="maxima")

[Out] 1/32*(4*((a^4*c^2*m^2 + 4*a^4*c^2*m + 3*a^4*c^2)*x^5 + 2*(a^2*c^2*m^2 + 6*a^2*c^2*m + 5*a^2*c^2)*x^3 + (c^2*m^2 + 8*c^2*m + 15*c^2)*x)*x^m*arctan(a*x)^3 - 3*((a^4*c^2*m^2 + 4*a^4*c^2*m + 3*a^4*c^2)*x^5 + 2*(a^2*c^2*m^2 + 6*a^2*c^2*m + 5*a^2*c^2)*x^3 + (c^2*m^2 + 8*c^2*m + 15*c^2)*x)*x^m*arctan(a*x)*log(a^2*x^2 + 1)^2 + 32*(m^3 + 9*m^2 + 23*m + 15)*integrate(1/32*(28*((a^6*c^2*m^3 + 9*a^6*c^2*m^2 + 23*a^6*c^2*m + 15*a^6*c^2)*x^6 + c^2*m^3 + 3*(a^4*c^2*m^3 + 9*a^4*c^2*m^2 + 23*a^4*c^2*m + 15*a^4*c^2)*x^4 + 9*c^2*m^2 + 23*c^2*m + 3*(a^2*c^2*m^3 + 9*a^2*c^2*m^2 + 23*a^2*c^2*m + 15*a^2*c^2)*x^2 + 15*c^2)*x^m*arctan(a*x)^3 - 12*((a^5*c^2*m^2 + 4*a^5*c^2*m + 3*a^5*c^2)*x^5 + 2*(a^3*c^2*m^2 + 6*a^3*c^2*m + 5*a^3*c^2)*x^3 + (a*c^2*m^2 + 8*a*c^2*m + 15*a*c^2)*x)*x^m*arctan(a*x)^2 + 12*((a^6*c^2*m^2 + 4*a^6*c^2*m + 3*a^6*c^2)*x^6 + 2*(a^4*c^2*m^2 + 6*a^4*c^2*m + 5*a^4*c^2)*x^4 + (a^2*c^2*m^2 + 8*a^2*c^2*m + 15*a^2*c^2)*x^2)*x^m*arctan(a*x)*log(a^2*x^2 + 1) + 3*(((a^6*c^2*m^3 + 9*a^6*c^2*m^2 + 23*a^6*c^2*m + 15*a^6*c^2)*x^6 + c^2*m^3 + 3*(a^4*c^2*m^3 + 9*a^4*c^2*m^2 + 23*a^4*c^2*m + 15*a^4*c^2)*x^4 + 9*c^2*m^2 + 23*c^2*m + 3*(a^2*c^2*m^3 + 9*a^2*c^2*m^2 + 23*a^2*c^2*m + 15*a^2*c^2)*x^2 + 15*c^2)*x^m*arctan(a*x) + ((a^5*c^2*m^2 + 4*a^5*c^2*m + 3*a^5*c^2)*x^5 + 2*(a^3*c^2*m^2 + 6*a^3*c^2*m + 5*a^3*c^2)*x^3 + (a*c^2*m^2 + 8*a*c^2*m + 15*a*c^2)*x)*x^m)*log(a^2*x^2 + 1)^2)/(m^3 + (a^2*m^3 + 9*a^2*m^2 + 23*a^2*m + 15*a^2)*x^2 + 9*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23*m + 15)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m*atan(a*x)^3*(c + a^2*c*x^2)^2,x)

[Out] int(x^m*atan(a*x)^3*(c + a^2*c*x^2)^2, x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int x^{m}\operatorname{atan}^{3}{\left(ax\right)}\,dx+\int 2a^{2}x^{2}x^{m}\operatorname{atan}^{3}{\left(ax\right)}\,dx+\int a^{4}x^{4}x^{m}\operatorname{atan}^{3}{\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m*(a**2*c*x**2+c)**2*atan(a*x)**3,x)

[Out] c**2*(Integral(x**m*atan(a*x)**3, x) + Integral(2*a**2*x**2*x**m*atan(a*x)**3, x) + Integral(a**4*x**4*x**m*atan(a*x)**3, x))

3.459 $\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^3 \, dx$

Optimal. Leaf size=23

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right) \tan^{-1}(a x)^3,x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)*arctan(a*x)^3,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)*ArcTan[a*x]^3, x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^3 \, dx=\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^3 \, dx$$

Mathematica [A] time = 1.05, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^3,x]
[Out] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^3, x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right) x^m \arctan\left(a x\right)^3,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m*arctan(a*x)^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.34, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^3,x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{15}{2}\left(\left(a^2cm+a^2c\right)x^3+(cm+3c)x\right)x^m\arctan(ax)^3-\frac{21}{8}\left(\left(a^2cm+a^2c\right)x^3+(cm+3c)x\right)x^m\arctan(ax)\log\left(a^2x\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/32*(4*((a^2*c*m + a^2*c)*x^3 + (c*m + 3*c)*x)*x^m*arctan(a*x)^3 - 3*((a^2
*c*m + a^2*c)*x^3 + (c*m + 3*c)*x)*x^m*arctan(a*x)*log(a^2*x^2 + 1)^2 + 32*
(m^2 + 4*m + 3)*integrate(1/32*(28*((a^4*c*m^2 + 4*a^4*c*m + 3*a^4*c)*x^4 +
 c*m^2 + 2*(a^2*c*m^2 + 4*a^2*c*m + 3*a^2*c)*x^2 + 4*c*m + 3*c)*x^m*arctan(
a*x)^3 - 12*((a^3*c*m + a^3*c)*x^3 + (a*c*m + 3*a*c)*x)*x^m*arctan(a*x)^2 +
 12*((a^4*c*m + a^4*c)*x^4 + (a^2*c*m + 3*a^2*c)*x^2)*x^m*arctan(a*x)*log(a
^2*x^2 + 1) + 3*(((a^4*c*m^2 + 4*a^4*c*m + 3*a^4*c)*x^4 + c*m^2 + 2*(a^2*c*
m^2 + 4*a^2*c*m + 3*a^2*c)*x^2 + 4*c*m + 3*c)*x^m*arctan(a*x) + ((a^3*c*m +
 a^3*c)*x^3 + (a*c*m + 3*a*c)*x)*x^m)*log(a^2*x^2 + 1)^2)/((a^2*m^2 + 4*a^2
*m + 3*a^2)*x^2 + m^2 + 4*m + 3), x))/(m^2 + 4*m + 3)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^3*(c + a^2*c*x^2),x)
```

```
[Out] int(x^m*atan(a*x)^3*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^m\operatorname{atan}^3(ax)\,dx+\int a^2x^2x^m\operatorname{atan}^3(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)*atan(a*x)**3,x)
```

```
[Out] c*(Integral(x**m*atan(a*x)**3, x) + Integral(a**2*x**2*x**m*atan(a*x)**3, x
))
```

3.460 $\int \frac{x^m \tan^{-1}(ax)^3}{c+a^2cx^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^3}{a^2cx^2+c},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^3/(a^2*c*x^2+c),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^3}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^3}{c+a^2cx^2}\,dx = \int \frac{x^m \tan^{-1}(ax)^3}{c+a^2cx^2}\,dx$$

Mathematica [A] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^3}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2),x]
[Out] Integrate[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^3}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.51, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{a^2c\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c),x)
[Out] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{a^2cx^2 + c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2 + c), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\,x)^3}{c\,a^2\,x^2 + c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2),x)
[Out] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m \operatorname{atan}^3(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**3/(a**2*c*x**2+c),x)
[Out] Integral(x**m*atan(a*x)**3/(a**2*x**2 + 1), x)/c
```

3.461 $\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^3}{\left(a^2cx^2+c\right)^2}, x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] Defer[Int][(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2, x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx = \int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx$$

Mathematica [A] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2,x]
```

```
[Out] Integrate[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^3}{a^4c^2x^4+2\,a^2c^2x^2+c^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] integral(x^m*arctan(a*x)^3/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

[Out] Timed out

maple [A] time = 1.50, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{(a^2 c x^2 + c)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^2,x)

[Out] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^2,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{(a^2 c x^2 + c)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^2,x, algorithm="maxima")

[Out] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2 + c)^2, x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\,x)^3}{(c\,a^2\,x^2 + c)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2)^2,x)

[Out] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2)^2, x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m \operatorname{atan}^3(ax)}{a^4x^4+2a^2x^2+1} dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m*atan(a*x)**3/(a**2*c*x**2+c)**2,x)

[Out] Integral(x**m*atan(a*x)**3/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2

3.462 $\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^{3/2} \tan^{-1}(ax)^3, x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3, x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx = \int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$$

Mathematica [A] time = 1.14, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3,x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right)^{\frac{3}{2}} x^m \arctan\left(ax\right)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.95, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arctan\left(a x\right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x)
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a^{2} c x^{2}+c\right)^{\frac{3}{2}} x^{m} \arctan\left(a x\right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^{m}\, \mathrm{atan}\left(a\,x\right)^{3} \left(c\,a^{2}\,x^{2}+c\right)^{3/2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^3*(c + a^2*c*x^2)^(3/2),x)
[Out] int(x^m*atan(a*x)^3*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)*atan(a*x)**3,x)
[Out] Timed out
```

3.463 $\int x^m \sqrt{c + a^2 c x^2} \tan^{-1}(ax)^3 \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \sqrt{a^2 c x^2 + c} \tan^{-1}(ax)^3, x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \sqrt{c + a^2 c x^2} \tan^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
[Out] Defer[Int][x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3, x]
```

Rubi steps

$$\int x^m \sqrt{c + a^2 c x^2} \tan^{-1}(ax)^3 \, dx = \int x^m \sqrt{c + a^2 c x^2} \tan^{-1}(ax)^3 \, dx$$

Mathematica [A] time = 0.18, size = 0, normalized size = 0.00

$$\int x^m \sqrt{c + a^2 c x^2} \tan^{-1}(ax)^3 \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3,x]
[Out] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2 c x^2 + c}\, x^m \arctan(ax)^3, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 0.99, size = 0, normalized size = 0.00

$$\int x^m \arctan(ax)^3 \sqrt{a^2 c x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{a^2cx^2+c}\,x^m\arctan(ax)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m\,\mathrm{atan}\left(a\,x\right)^3\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^3*(c + a^2*c*x^2)^(1/2),x)
[Out] int(x^m*atan(a*x)^3*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^3(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**3*(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3, x)
```

3.464 $\int \frac{x^m \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^3}{\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} dx = \int \frac{x^m \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} dx$$

Mathematica [A] time = 0.57, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^3}{\sqrt{c+a^2cx^2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2],x]
[Out] Integrate[(x^m*ArcTan[a*x]^3)/Sqrt[c + a^2*c*x^2], x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^3}{\sqrt{a^2cx^2+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{\sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{\sqrt{a^2 c x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m*arctan(a*x)^3/sqrt(a^2*c*x^2 + c), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\, x)^3}{\sqrt{c\, a^2\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2),x)
[Out] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \operatorname{atan}^3(ax)}{\sqrt{c\left(a^2 x^2 + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m*atan(a*x)**3/sqrt(c*(a**2*x**2 + 1)), x)
```

3.465 $\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^3}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] Defer[Int][(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 0.70, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^3}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] Integrate[(x^m*ArcTan[a*x]^3)/(c + a^2*c*x^2)^(3/2), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m \arctan\left(ax\right)^3}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^3/(a^4*c^2*x^4 + 2*a^2*c^2*x^2
 + c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.64, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{\left(a^2 c\, x^2 + c\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)

[Out] int(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^3}{\left(a^2 c x^2 + c\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")

[Out] integrate(x^m*arctan(a*x)^3/(a^2*c*x^2 + c)^(3/2), x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\, x)^3}{\left(c\, a^2\, x^2 + c\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2),x)

[Out] int((x^m*atan(a*x)^3)/(c + a^2*c*x^2)^(3/2), x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \operatorname{atan}^3(ax)}{\left(c\left(a^2x^2 + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m*atan(a*x)**3/(a**2*c*x**2+c)**(3/2),x)

[Out] Integral(x**m*atan(a*x)**3/(c*(a**2*x**2 + 1))**(3/2), x)

3.466 $\int \frac{x(c+a^2cx^2)}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=21

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2))/ArcTan[a*x],x]
[Out] Defer[Int][(x*(c + a^2*c*x^2))/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)}\,dx=\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x],x]
[Out] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x], x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2cx^3+cx}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^2*c*x^3 + c*x)/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.50, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)}{\arctan\left(a x\right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)/arctan(a*x),x)
```

```
[Out] int(x*(a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right) x}{\arctan\left(a x\right)}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)*x/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{x\,\left(c\,a^2\,x^2+c\right)}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2))/atan(a*x),x)
```

```
[Out] int((x*(c + a^2*c*x^2))/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x}{\operatorname{atan}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{3}}{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)/atan(a*x),x)
```

```
[Out] c*(Integral(x/atan(a*x), x) + Integral(a**2*x**3/atan(a*x), x))
```

3.467 $\int \frac{c+a^2cx^2}{\tan^{-1}(ax)} dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{a^2cx^2+c}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/ArcTan[a*x],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)} dx = \int \frac{c+a^2cx^2}{\tan^{-1}(ax)} dx$$

Mathematica [A] time = 0.41, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/ArcTan[a*x],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)/ArcTan[a*x], x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2cx^2+c}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{a^2c\,x^2+c}{\arctan(ax)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/arctan(a*x),x)
[Out] int((a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^2cx^2 + c}{\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{c\,a^2\,x^2 + c}{\operatorname{atan}(a\,x)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/atan(a*x),x)
[Out] int((c + a^2*c*x^2)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{a^2x^2}{\operatorname{atan}(ax)}\,dx + \int \frac{1}{\operatorname{atan}(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/atan(a*x),x)
[Out] c*(Integral(a**2*x**2/atan(a*x), x) + Integral(1/atan(a*x), x))
```

3.468 $\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{a^2cx^2+c}{x\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/x/arctan(a*x),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/(x*ArcTan[a*x]),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)/(x*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)}\,dx=\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2cx^2+c}{x\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)/(x*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.10, size = 0, normalized size = 0.00

$$\int \frac{a^2c\,x^2+c}{x\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/x/arctan(a*x),x)
[Out] int((a^2*c*x^2+c)/x/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a^2cx^2+c}{x\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)/(x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{c\,a^2\,x^2+c}{x\,\mathrm{atan}\left(a\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/(x*atan(a*x)),x)
[Out] int((c + a^2*c*x^2)/(x*atan(a*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{1}{x\,\mathrm{atan}\,(ax)}\,dx+\int \frac{a^2x}{\mathrm{atan}\,(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/x/atan(a*x),x)
[Out] c*(Integral(1/(x*atan(a*x)), x) + Integral(a**2*x/atan(a*x), x))
```

3.469 $\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)^2/arctan(a*x),x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x],x]

[Out] Defer[Int][(x*(c + a^2*c*x^2)^2)/ArcTan[a*x], x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)}\,dx=\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.61, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x],x]

[Out] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x], x]

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^4c^2x^5+2\,a^2c^2x^3+c^2x}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")

[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)/arctan(a*x), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.77, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{2}}{\arctan\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2/arctan(a*x),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(a^{2} c x^{2}+c\right)}^{2} x}{\arctan\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^2*x/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^2}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^2)/atan(a*x),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^2)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x}{\operatorname{atan}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x^{3}}{\operatorname{atan}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{5}}{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] c**2*(Integral(x/atan(a*x), x) + Integral(2*a**2*x**3/atan(a*x), x) + Integ
ral(a**4*x**5/atan(a*x), x))
```

3.470 $\int \frac{\left(c+a^2 c x^2\right)^2}{\tan^{-1}(a x)} \, dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{\left(a^2 c x^2+c\right)^2}{\tan^{-1}(a x)},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^2/arctan(a*x),x)

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2 c x^2\right)^2}{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)^2/ArcTan[a*x],x]

[Out] Defer[Int][(c + a^2*c*x^2)^2/ArcTan[a*x], x]

Rubi steps

$$\int \frac{\left(c+a^2 c x^2\right)^2}{\tan^{-1}(a x)} \, dx=\int \frac{\left(c+a^2 c x^2\right)^2}{\tan^{-1}(a x)} \, dx$$

Mathematica [A] time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2 c x^2\right)^2}{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x],x]

[Out] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x], x]

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^4 c^2 x^4 + 2\, a^2 c^2 x^2 + c^2}{\arctan\left(a x\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")

[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)/arctan(a*x), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{2}}{\arctan\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/arctan(a*x),x)
```

```
[Out] int((a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{2}}{\arctan\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^2/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\left(c\,a^{2}\,x^{2}+c\right)^{2}}{\mathrm{atan}\left(a\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/atan(a*x),x)
```

```
[Out] int((c + a^2*c*x^2)^2/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int \frac{2a^{2}x^{2}}{\operatorname{atan}\left(ax\right)}\,dx+\int \frac{a^{4}x^{4}}{\operatorname{atan}\left(ax\right)}\,dx+\int \frac{1}{\operatorname{atan}\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] c**2*(Integral(2*a**2*x**2/atan(a*x), x) + Integral(a**4*x**4/atan(a*x), x)
 + Integral(1/atan(a*x), x))
```

3.471 $\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\operatorname{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{x\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/x/arctan(a*x),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]),x]
[Out] Defer[Int][(c + a^2*c*x^2)^2/(x*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]),x]
[Out] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{a^4c^2x^4+2\,a^2c^2x^2+c^2}{x\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)/(x*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.06, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{2}}{x \arctan \left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/x/arctan(a*x),x)
```

```
[Out] int((a^2*c*x^2+c)^2/x/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{2}}{x \arctan \left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^2/(x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^2}{x\,\mathrm{atan}\left(a\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/(x*atan(a*x)),x)
```

```
[Out] int((c + a^2*c*x^2)^2/(x*atan(a*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{1}{x \operatorname{atan}{\left(ax \right)}}\, dx + \int \frac{2 a^{2} x}{\operatorname{atan}{\left(ax \right)}}\, dx + \int \frac{a^{4} x^{3}}{\operatorname{atan}{\left(ax \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/x/atan(a*x),x)
```

```
[Out] c**2*(Integral(1/(x*atan(a*x)), x) + Integral(2*a**2*x/atan(a*x), x) + Inte
gral(a**4*x**3/atan(a*x), x))
```

3.472 $\int \frac{x(c+a^2cx^2)^3}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^3/arctan(a*x),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x],x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^3)/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx=\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.58, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x],x]
[Out] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x], x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x)/arctan(a*x),
 x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.15, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2}c\,x^{2}+c\right)^{3}}{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2}cx^{2}+c\right)^{3}x}{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^3*x/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\left(c\,a^{2}\,x^{2}+c\right)^{3}}{\mathrm{atan}\left(a\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^3)/atan(a*x),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^3)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{x}{\operatorname{atan}\left(ax\right)}\,dx+\int \frac{3a^{2}x^{3}}{\operatorname{atan}\left(ax\right)}\,dx+\int \frac{3a^{4}x^{5}}{\operatorname{atan}\left(ax\right)}\,dx+\int \frac{a^{6}x^{7}}{\operatorname{atan}\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] c**3*(Integral(x/atan(a*x), x) + Integral(3*a**2*x**3/atan(a*x), x) + Integ
ral(3*a**4*x**5/atan(a*x), x) + Integral(a**6*x**7/atan(a*x), x))
```

3.473 $\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)} dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{(a^2cx^2+c)^3}{\tan^{-1}(ax)},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^3/arctan(a*x),x)

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)^3/ArcTan[a*x],x]

[Out] Defer[Int][(c + a^2*c*x^2)^3/ArcTan[a*x], x]

Rubi steps

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)} dx = \int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)} dx$$

Mathematica [A] time = 0.49, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x],x]

[Out] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x], x]

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")

[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)/arctan(a*x), x
)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.87, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{3}}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a^2*c*x^2+c)^3/arctan(a*x),x)

[Out] int((a^2*c*x^2+c)^3/arctan(a*x),x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{3}}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^3/arctan(a*x), x)

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^3}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c + a^2*c*x^2)^3/atan(a*x),x)

[Out] int((c + a^2*c*x^2)^3/atan(a*x), x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{3 a^{2} x^{2}}{\operatorname{atan}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{4}}{\operatorname{atan}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{6}}{\operatorname{atan}{\left(a x \right)}}\, dx + \int \frac{1}{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a**2*c*x**2+c)**3/atan(a*x),x)

[Out] c**3*(Integral(3*a**2*x**2/atan(a*x), x) + Integral(3*a**4*x**4/atan(a*x), x) + Integral(a**6*x**6/atan(a*x), x) + Integral(1/atan(a*x), x))

3.474 $\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3}{x\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/x/arctan(a*x),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3/(x*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)}\,dx=\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3}{x\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)/(x*arctan(a*x)
), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.10, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c x^2 + c\right)^3}{x \arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/x/arctan(a*x),x)
```

```
[Out] int((a^2*c*x^2+c)^3/x/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c x^2 + c\right)^3}{x \arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^3/(x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\, a^2\, x^2 + c\right)^3}{x\, \mathrm{atan}\left(a\, x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/(x*atan(a*x)),x)
```

```
[Out] int((c + a^2*c*x^2)^3/(x*atan(a*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3 \left(\int \frac{1}{x\, \mathrm{atan}\left(ax\right)}\, dx + \int \frac{3a^2 x}{\mathrm{atan}\left(ax\right)}\, dx + \int \frac{3a^4 x^3}{\mathrm{atan}\left(ax\right)}\, dx + \int \frac{a^6 x^5}{\mathrm{atan}\left(ax\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/x/atan(a*x),x)
```

```
[Out] c**3*(Integral(1/(x*atan(a*x)), x) + Integral(3*a**2*x/atan(a*x), x) + Inte
gral(3*a**4*x**3/atan(a*x), x) + Integral(a**6*x**5/atan(a*x), x))
```

3.475 $\int \frac{x^2}{(c+a^2cx^2)\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^2}{\left(a^2cx^2+c\right)\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^2/(a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^2/((c + a^2*c*x^2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx=\int \frac{x^2}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Integrate[x^2/((c + a^2*c*x^2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^2}{\left(a^2cx^2+c\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
[Out] integral(x^2/((a^2*c*x^2 + c)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)/arctan(a*x),x)
[Out] int(x^2/(a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{{\left(a^{2} c x^{2}+c\right)} \arctan \left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^2/((a^2*c*x^2 + c)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)*(c + a^2*c*x^2)),x)
[Out] int(x^2/(atan(a*x)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2}}{a^{2} x^{2} \operatorname{atan}{\left(a x \right)} + \operatorname{atan}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)/atan(a*x),x)
[Out] Integral(x**2/(a**2*x**2*atan(a*x) + atan(a*x)), x)/c
```

3.476 $\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x}{\left(a^2cx^2+c\right)\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x/(a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Defer[Int][x/((c + a^2*c*x^2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx=\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.57, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x}{\left(a^2cx^2+c\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
[Out] integral(x/((a^2*c*x^2 + c)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c\,x^{2}+c\right) \arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)/arctan(a*x),x)
[Out] int(x/(a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c x^{2}+c\right) \arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x/((a^2*c*x^2 + c)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)*(c + a^2*c*x^2)),x)
[Out] int(x/(atan(a*x)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{2} x^{2} \operatorname{atan}{\left (a x \right)} + \operatorname{atan}{\left (a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)/atan(a*x),x)
[Out] Integral(x/(a**2*x**2*atan(a*x) + atan(a*x)), x)/c
```

3.477 $\int \frac{1}{(c+a^2cx^2)\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=12

$$\frac{\log\left(\tan^{-1}(ax)\right)}{ac}$$

```
[Out] ln(arctan(a*x))/a/c
```

Rubi [A] time = 0.03, antiderivative size = 12, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4882}

$$\frac{\log\left(\tan^{-1}(ax)\right)}{ac}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)*ArcTan[a*x]),x]
```

```
[Out] Log[ArcTan[a*x]]/(a*c)
```

Rule 4882

```
Int[1/(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_) + (e_.)*(x_)^2)), x_Symbol]
 :> Simp[Log[RemoveContent[a + b*ArcTan[c*x], x]]/(b*c*d), x] /; FreeQ[{a,
b, c, d, e}, x] && EqQ[e, c^2*d]
```

Rubi steps

$$\int \frac{1}{(c+a^2cx^2)\tan^{-1}(ax)}\,dx = \frac{\log\left(\tan^{-1}(ax)\right)}{ac}$$

Mathematica [A] time = 0.02, size = 12, normalized size = 1.00

$$\frac{\log\left(\tan^{-1}(ax)\right)}{ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)*ArcTan[a*x]),x]
```

```
[Out] Log[ArcTan[a*x]]/(a*c)
```

fricas [A] time = 0.40, size = 12, normalized size = 1.00

$$\frac{\log\left(\arctan\left(ax\right)\right)}{ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
```

```
[Out] log(arctan(a*x))/(a*c)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.08, size = 13, normalized size = 1.08

$$\frac{\ln\left(\arctan\left(ax\right)\right)}{ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)/arctan(a*x),x)
```

```
[Out] ln(arctan(a*x))/a/c
```

maxima [A] time = 0.32, size = 15, normalized size = 1.25

$$\frac{\log\left(2\left|\arctan\left(ax\right)\right|\right)}{ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] log(2*abs(arctan(a*x)))/(a*c)
```

mupad [B] time = 0.09, size = 12, normalized size = 1.00

$$\frac{\ln\left(\mathrm{atan}\left(a\,x\right)\right)}{a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)*(c + a^2*c*x^2)),x)
```

```
[Out] log(atan(a*x))/(a*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{\log\left(\operatorname{atan}\left(ax\right)\right)}{ac} & \text{for}\ c \neq 0 \\ \tilde{\infty} \int \frac{1}{\operatorname{atan}\left(ax\right)}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)/atan(a*x),x)
```

```
[Out] Piecewise((log(atan(a*x))/(a*c), Ne(c, 0)), (zoo*Integral(1/atan(a*x), x),
True))
```

3.478 $\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x*(c + a^2*c*x^2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.20, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^3+cx\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
[Out] integral(1/((a^2*c*x^3 + c*x)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.25, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)/arctan(a*x),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2}cx^{2}+c\right)x\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)*x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)\,\left(c\,a^{2}\,x^{2}+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x*atan(a*x)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2}x^{3}\,\mathrm{atan}\left(ax\right)+x\,\mathrm{atan}\left(ax\right)}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)/atan(a*x),x)
```

```
[Out] Integral(1/(a**2*x**3*atan(a*x) + x*atan(a*x)), x)/c
```

3.479 $\int \frac{1}{x^2(c+a^2cx^2)\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x^2/(a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx=\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^4+cx^2\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
[Out] integral(1/((a^2*c*x^4 + c*x^2)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.54, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c\, x^{2}+c \right) \arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)/arctan(a*x),x)
[Out] int(1/x^2/(a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{{\left(a^{2} c x^{2} + c\right)} x^{2} \arctan\left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)*x^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)),x)
[Out] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2} x^{4} \operatorname{atan}{\left(a x \right)} + x^{2} \operatorname{atan}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)/atan(a*x),x)
[Out] Integral(1/(a**2*x**4*atan(a*x) + x**2*atan(a*x)), x)/c
```

3.480 $\int \frac{x^4}{(c+a^2cx^2)^2 \tan^{-1}(ax)} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^4}{\left(a^2cx^2+c\right)^2 \tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^4/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^4/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Defer[Int][x^4/((c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx=\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 4.25, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Integrate[x^4/((c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^4}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] integral(x^4/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.01, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c\,x^2+c\right)^2 \arctan\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

```
[Out] int(x^4/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c x^2+c\right)^2 \arctan\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^4/((a^2*c*x^2 + c)^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^4}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^4/(atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4}{a^4 x^4 \operatorname{atan}{\left(a x\right)} + 2 a^2 x^2 \operatorname{atan}{\left(a x\right)} + \operatorname{atan}{\left(a x\right)}}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] Integral(x**4/(a**4*x**4*atan(a*x) + 2*a**2*x**2*atan(a*x) + atan(a*x)), x)
/c**2
```

3.481 $\int \frac{x^3}{(c+a^2cx^2)^2 \tan^{-1}(ax)} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^3}{(a^2cx^2+c)^2 \tan^{-1}(ax)}, x\right)$$

```
[Out] Unintegrable(x^3/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{(c+a^2cx^2)^2 \tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Defer[Int][x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^3}{(c+a^2cx^2)^2 \tan^{-1}(ax)} dx = \int \frac{x^3}{(c+a^2cx^2)^2 \tan^{-1}(ax)} dx$$

Mathematica [A] time = 2.86, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(c+a^2cx^2)^2 \tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^3}{(a^4c^2x^4 + 2a^2c^2x^2 + c^2)\arctan(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] integral(x^3/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c\, x^2 + c\right)^2 \arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c x^2 + c\right)^2 \arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^3/((a^2*c*x^2 + c)^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^3}{\mathrm{atan}\left(a\, x\right)\, \left(c\, a^2\, x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^4 x^4 \operatorname{atan}\left(ax\right) + 2a^2 x^2 \operatorname{atan}\left(ax\right) + \operatorname{atan}\left(ax\right)}\, dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] Integral(x**3/(a**4*x**4*atan(a*x) + 2*a**2*x**2*atan(a*x) + atan(a*x)), x)
/c**2
```

3.482 $\int \frac{x^2}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx$

Optimal. Leaf size=33

$$\frac{\log\left(\tan^{-1}(ax)\right)}{2a^3c^2}-\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^3c^2}$$

```
[Out] -1/2*Ci(2*arctan(a*x))/a^3/c^2+1/2*ln(arctan(a*x))/a^3/c^2
```

Rubi [A] time = 0.11, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4970, 3312, 3302}

$$\frac{\log\left(\tan^{-1}(ax)\right)}{2a^3c^2}-\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{2a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
```

```
[Out] -CosIntegral[2*ArcTan[a*x]]/(2*a^3*c^2) + Log[ArcTan[a*x]]/(2*a^3*c^2)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\sin^2(x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{a^3c^2}\\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right)dx,x,\tan^{-1}(ax)\right)}{a^3c^2}\\
&= \frac{\log\left(\tan^{-1}(ax)\right)}{2a^3c^2}-\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{2a^3c^2}\\
&= -\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^3c^2}+\frac{\log\left(\tan^{-1}(ax)\right)}{2a^3c^2}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 25, normalized size = 0.76

$$\frac{\log\left(\tan^{-1}(ax)\right)-\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] (-CosIntegral[2*ArcTan[a*x]] + Log[ArcTan[a*x]])/(2*a^3*c^2)
```

fricas [C] time = 0.44, size = 74, normalized size = 2.24

$$\frac{2\log\left(\arctan\left(ax\right)\right)-\text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right)-\text{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right)}{4\,a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] 1/4*(2*log(arctan(a*x)) - log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 +
1)) - log_integral(-(a^2*x^2 - 2*I*a*x - 1)/(a^2*x^2 + 1)))/(a^3*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.24, size = 30, normalized size = 0.91

$$-\frac{\text{Ci}\left(2\arctan\left(ax\right)\right)}{2a^3c^2}+\frac{\ln\left(\arctan\left(ax\right)\right)}{2a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^2/arctan(a*x),x)
[Out] -1/2*Ci(2*arctan(a*x))/a^3/c^2+1/2*ln(arctan(a*x))/a^3/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^2}{\left(a^2cx^2+c\right)^2\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^2/((a^2*c*x^2 + c)^2*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{x^2}{\text{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^4x^4 \operatorname{atan}(ax)+2a^2x^2 \operatorname{atan}(ax)+\operatorname{atan}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] Integral(x**2/(a**4*x**4*atan(a*x) + 2*a**2*x**2*atan(a*x) + atan(a*x)), x)
/c**2
```

3.483 $\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=17

$$\frac{\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{2a^2c^2}$$

```
[Out] 1/2*Si(2*arctan(a*x))/a^2/c^2
```

Rubi [A] time = 0.07, antiderivative size = 17, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {4970, 4406, 12, 3299}

$$\frac{\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{2a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
```

```
[Out] SinIntegral[2*ArcTan[a*x]]/(2*a^2*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx = \frac{\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^2}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^2}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{2a^2c^2}$$
$$= \frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{2a^2c^2}$$

Mathematica [A] time = 0.04, size = 17, normalized size = 1.00

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{2a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] SinIntegral[2*ArcTan[a*x]]/(2*a^2*c^2)
```

fricas [C] time = 0.40, size = 67, normalized size = 3.94

$$\frac{i\ \text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right) - i\ \text{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right)}{4\,a^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] 1/4*(I*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 + 1)) - I*log_integra
l(-(a^2*x^2 - 2*I*a*x - 1)/(a^2*x^2 + 1)))/(a^2*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.23, size = 16, normalized size = 0.94

$$\frac{\text{Si}\left(2\arctan\left(ax\right)\right)}{2a^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^2/arctan(a*x),x)
[Out] 1/2*Si(2*arctan(a*x))/a^2/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^2cx^2+c\right)^2\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x/((a^2*c*x^2 + c)^2*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.06

$$\int \frac{x}{\operatorname{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x/(atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^4x^4\operatorname{atan}(ax)+2a^2x^2\operatorname{atan}(ax)+\operatorname{atan}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] Integral(x/(a**4*x**4*atan(a*x) + 2*a**2*x**2*atan(a*x) + atan(a*x)), x)/c*
*2
```

3.484 $\int \frac{1}{(c+a^2cx^2)^2 \tan^{-1}(ax)} \, dx$

Optimal. Leaf size=33

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2ac^2} + \frac{\log\left(\tan^{-1}(ax)\right)}{2ac^2}$$

```
[Out] 1/2*Ci(2*arctan(a*x))/a/c^2+1/2*ln(arctan(a*x))/a/c^2
```

Rubi [A] time = 0.07, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4904, 3312, 3302}

$$\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{2ac^2} + \frac{\log\left(\tan^{-1}(ax)\right)}{2ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
```

```
[Out] CosIntegral[2*ArcTan[a*x]]/(2*a*c^2) + Log[ArcTan[a*x]]/(2*a*c^2)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx &= \frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x} \, dx, x, \tan^{-1}(ax)\right)}{ac^2} \\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{2x}+\frac{\cos(2x)}{2x}\right) dx, x, \tan^{-1}(ax)\right)}{ac^2} \\
&= \frac{\log\left(\tan^{-1}(ax)\right)}{2ac^2}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x} \, dx, x, \tan^{-1}(ax)\right)}{2ac^2} \\
&= \frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2ac^2}+\frac{\log\left(\tan^{-1}(ax)\right)}{2ac^2}
\end{aligned}$$

Mathematica [A] time = 0.02, size = 23, normalized size = 0.70

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)+\log\left(\tan^{-1}(ax)\right)}{2ac^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] (CosIntegral[2*ArcTan[a*x]] + Log[ArcTan[a*x]])/(2*a*c^2)
```

fricas [C] time = 0.41, size = 70, normalized size = 2.12

$$\frac{2\log\left(\arctan\left(ax\right)\right)+\text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right)+\text{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right)}{4\,ac^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] 1/4*(2*log(arctan(a*x)) + log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 +
1)) + log_integral(-(a^2*x^2 - 2*I*a*x - 1)/(a^2*x^2 + 1)))/(a*c^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.21, size = 30, normalized size = 0.91

$$\frac{\text{Ci}\left(2\arctan\left(ax\right)\right)}{2a\,c^2}+\frac{\ln\left(\arctan\left(ax\right)\right)}{2a\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^2/arctan(a*x),x)
[Out] 1/2*Ci(2*arctan(a*x))/a/c^2+1/2*ln(arctan(a*x))/a/c^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{1}{\left(a^2cx^2+c\right)^2\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^2*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{1}{\text{atan}\left(a\,x\right)\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^4\operatorname{atan}(ax)+2a^2x^2\operatorname{atan}(ax)+\operatorname{atan}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] Integral(1/(a**4*x**4*atan(a*x) + 2*a**2*x**2*atan(a*x) + atan(a*x)), x)/c*
*2
```

3.485 $\int \frac{1}{x(c+a^2cx^2)^2 \tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^2\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.81, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)^{2}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2}cx^{2}+c\right)^{2}x\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^2*x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)\,\left(c\,a^{2}\,x^{2}+c\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4}x^{5}\,\mathrm{atan}\left(ax\right)+2a^{2}x^{3}\,\mathrm{atan}\left(ax\right)+x\,\mathrm{atan}\left(ax\right)}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] Integral(1/(a**4*x**5*atan(a*x) + 2*a**2*x**3*atan(a*x) + x*atan(a*x)), x)/
c**2
```

3.486 $\int \frac{1}{x^2(c+a^2cx^2)^2 \tan^{-1}(ax)} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{x^2 \left(a^2cx^2+c\right)^2 \tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x^2 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx = \int \frac{1}{x^2 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 1.23, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4c^2x^6+2\,a^2c^2x^4+c^2x^2\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.72, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{{\left(a^{2} c x^{2} + c\right)}^{2} x^{2} \arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^2*x^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{6} \operatorname{atan}{\left (a x \right)} + 2 a^{2} x^{4} \operatorname{atan}{\left (a x \right)} + x^{2} \operatorname{atan}{\left (a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] Integral(1/(a**4*x**6*atan(a*x) + 2*a**2*x**4*atan(a*x) + x**2*atan(a*x)),
x)/c**2
```

3.487 $\int \frac{x^6}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^6}{\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^6/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^6}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^6/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
[Out] Defer[Int][x^6/((c + a^2*c*x^2)^3*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^6}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx = \int \frac{x^6}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 6.90, size = 0, normalized size = 0.00

$$\int \frac{x^6}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^6/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
[Out] Integrate[x^6/((c + a^2*c*x^2)^3*ArcTan[a*x]), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^6}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
[Out] integral(x^6/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*
x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{x^6}{\left(a^2 c\, x^2 + c\right)^3 \arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6/(a^2*c*x^2+c)^3/arctan(a*x),x)
[Out] int(x^6/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^6}{\left(a^2 c x^2 + c\right)^3 \arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^6/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^6/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^6}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^6/(atan(a*x)*(c + a^2*c*x^2)^3),x)
[Out] int(x^6/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^6}{a^6 x^6 \operatorname{atan}(ax) + 3a^4x^4 \operatorname{atan}(ax) + 3a^2x^2 \operatorname{atan}(ax) + \operatorname{atan}(ax)}\, dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**6/(a**2*c*x**2+c)**3/atan(a*x),x)
[Out] Integral(x**6/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*at
an(a*x) + atan(a*x)), x)/c**3
```

3.488 $\int \frac{x^5}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^5}{\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)}, x\right)$$

[Out] Unintegrable(x^5/(a^2*c*x^2+c)^3/arctan(a*x),x)

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

[In] Int[x^5/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]

[Out] Defer[Int][x^5/((c + a^2*c*x^2)^3*ArcTan[a*x]), x]

Rubi steps

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} dx = \int \frac{x^5}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} dx$$

Mathematica [A] time = 8.91, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

[In] Integrate[x^5/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]

[Out] Integrate[x^5/((c + a^2*c*x^2)^3*ArcTan[a*x]), x]

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^5}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^5/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")

[Out] integral(x^5/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^5/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2 c\, x^2 + c\right)^3 \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] int(x^5/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2 c x^2 + c\right)^3 \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^5/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^5}{\mathrm{atan}\left(a\, x\right)\, \left(c\, a^2\, x^2 + c\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^5/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^5}{a^6 x^6 \operatorname{atan}{\left(a x \right)} + 3 a^4 x^4 \operatorname{atan}{\left(a x \right)} + 3 a^2 x^2 \operatorname{atan}{\left(a x \right)} + \operatorname{atan}{\left(a x \right)}}\, dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(x**5/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*at
an(a*x) + atan(a*x)), x)/c**3
```

3.489 $\int \frac{x^4}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$

Optimal. Leaf size=50

$$-\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^5c^3}+\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{8a^5c^3}+\frac{3\log\left(\tan^{-1}(ax)\right)}{8a^5c^3}$$

```
[Out] -1/2*Ci(2*arctan(a*x))/a^5/c^3+1/8*Ci(4*arctan(a*x))/a^5/c^3+3/8*ln(arctan(
a*x))/a^5/c^3
```

Rubi [A] time = 0.13, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4970, 3312, 3302}

$$-\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{2a^5c^3}+\frac{\text{CosIntegral}\left(4\tan^{-1}(ax)\right)}{8a^5c^3}+\frac{3\log\left(\tan^{-1}(ax)\right)}{8a^5c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^4/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
```

```
[Out] -CosIntegral[2*ArcTan[a*x]]/(2*a^5*c^3) + CosIntegral[4*ArcTan[a*x]]/(8*a^5
*c^3) + (3*Log[ArcTan[a*x]])/(8*a^5*c^3)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^4}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx &= \frac{\text{Subst}\left(\int \frac{\sin^4(x)}{x} \, dx, x, \tan^{-1}(ax)\right)}{a^5c^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{8x}-\frac{\cos(2x)}{2x}+\frac{\cos(4x)}{8x}\right) dx, x, \tan^{-1}(ax)\right)}{a^5c^3}\\
&= \frac{3\log\left(\tan^{-1}(ax)\right)}{8a^5c^3}+\frac{\text{Subst}\left(\int \frac{\cos(4x)}{x} \, dx, x, \tan^{-1}(ax)\right)}{8a^5c^3}-\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x} \, dx, x,\right.}{2a^5c^3}\\
&= -\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^5c^3}+\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{8a^5c^3}+\frac{3\log\left(\tan^{-1}(ax)\right)}{8a^5c^3}
\end{aligned}$$

Mathematica [A] time = 0.16, size = 34, normalized size = 0.68

$$\frac{-4\mathrm{Ci}\left(2\tan^{-1}(ax)\right)+\mathrm{Ci}\left(4\tan^{-1}(ax)\right)+3\log\left(\tan^{-1}(ax)\right)}{8a^5c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
```

```
[Out] (-4*CosIntegral[2*ArcTan[a*x]] + CosIntegral[4*ArcTan[a*x]] + 3*Log[ArcTan[
a*x]])/(8*a^5*c^3)
```

fricas [C] time = 0.56, size = 174, normalized size = 3.48

$$\frac{6\log\left(\arctan\left(ax\right)\right)+\mathrm{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+\mathrm{log\_integral}\left(\frac{a^4x^4-4i\,a^3x^3-6\,a^2x^2+4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)-4\ \mathrm{log\_ir}}{16\,a^5c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
```

```
[Out] 1/16*(6*log(arctan(a*x)) + log_integral((a^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2
- 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + log_integral((a^4*x^4 - 4*I*a^3
*x^3 - 6*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) - 4*log_integral
(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 + 1)) - 4*log_integral(-(a^2*x^2 - 2*I*a
*x - 1)/(a^2*x^2 + 1)))/(a^5*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.31, size = 45, normalized size = 0.90

$$-\frac{\mathrm{Ci}\left(2\arctan\left(ax\right)\right)}{2a^5c^3}+\frac{\mathrm{Ci}\left(4\arctan\left(ax\right)\right)}{8a^5c^3}+\frac{3\ln\left(\arctan\left(ax\right)\right)}{8a^5c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] -1/2*Ci(2*arctan(a*x))/a^5/c^3+1/8*Ci(4*arctan(a*x))/a^5/c^3+3/8*ln(arctan(
a*x))/a^5/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^4}{\left(a^2cx^2+c\right)^3\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^4/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{x^4}{\mathrm{atan}\left(a\,x\right)\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^4/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4}{a^6x^6\operatorname{atan}(ax)+3a^4x^4\operatorname{atan}(ax)+3a^2x^2\operatorname{atan}(ax)+\operatorname{atan}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(x**4/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*at
an(a*x) + atan(a*x)), x)/c**3
```

3.490 $\int \frac{x^3}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)}\,dx$

Optimal. Leaf size=35

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{4a^4c^3}-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{8a^4c^3}$$

```
[Out] 1/4*Si(2*arctan(a*x))/a^4/c^3-1/8*Si(4*arctan(a*x))/a^4/c^3
```

Rubi [A] time = 0.11, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4970, 4406, 3299}

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{4a^4c^3}-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{8a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
```

```
[Out] SinIntegral[2*ArcTan[a*x]]/(4*a^4*c^3) - SinIntegral[4*ArcTan[a*x]]/(8*a^4*
c^3)
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos(x)\sin^3(x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{a^4c^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{\sin(2x)}{4x}-\frac{\sin(4x)}{8x}\right)dx,x,\tan^{-1}(ax)\right)}{a^4c^3}\\
&= -\frac{\text{Subst}\left(\int \frac{\sin(4x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{8a^4c^3}+\frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{4a^4c^3}\\
&= \frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{4a^4c^3}-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{8a^4c^3}
\end{aligned}$$

Mathematica [A] time = 0.13, size = 27, normalized size = 0.77

$$-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)-2\text{Si}\left(2\tan^{-1}(ax)\right)}{8a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
[Out] -1/8*(-2*SinIntegral[2*ArcTan[a*x]] + SinIntegral[4*ArcTan[a*x]])/(a^4*c^3)
```

fricas [C] time = 0.58, size = 171, normalized size = 4.89

$$\frac{-i\ \text{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+i\ \text{log\_integral}\left(\frac{a^4x^4-4i\,a^3x^3-6\,a^2x^2+4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+2i\ \text{log\_integral}\left(-\frac{a^2x^2}{a}\right.}{16\,a^4c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
[Out] 1/16*(-I*log_integral((a^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^
4*x^4 + 2*a^2*x^2 + 1)) + I*log_integral((a^4*x^4 - 4*I*a^3*x^3 - 6*a^2*x^2
 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + 2*I*log_integral(-(a^2*x^2 + 2
*I*a*x - 1)/(a^2*x^2 + 1)) - 2*I*log_integral(-(a^2*x^2 - 2*I*a*x - 1)/(a^2
*x^2 + 1)))/(a^4*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.22, size = 32, normalized size = 0.91

$$\frac{\text{Si}\left(2\arctan\left(ax\right)\right)}{4a^4c^3}-\frac{\text{Si}\left(4\arctan\left(ax\right)\right)}{8a^4c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^3/arctan(a*x),x)
[Out] 1/4*Si(2*arctan(a*x))/a^4/c^3-1/8*Si(4*arctan(a*x))/a^4/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^3}{\left(a^2cx^2+c\right)^3\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^3/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{x^3}{\text{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^6x^6 \operatorname{atan}(ax)+3a^4x^4 \operatorname{atan}(ax)+3a^2x^2 \operatorname{atan}(ax)+\operatorname{atan}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(x**3/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*at
an(a*x) + atan(a*x)), x)/c**3
```

3.491 $\int \frac{x^2}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} dx$

Optimal. Leaf size=33

$$\frac{\log\left(\tan^{-1}(ax)\right)}{8a^3c^3} - \frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{8a^3c^3}$$

[Out] -1/8*Ci(4*arctan(a*x))/a^3/c^3+1/8*ln(arctan(a*x))/a^3/c^3

Rubi [A] time = 0.11, antiderivative size = 33, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.136, Rules used = {4970, 4406, 3302}

$$\frac{\log\left(\tan^{-1}(ax)\right)}{8a^3c^3} - \frac{\text{CosIntegral}\left(4\tan^{-1}(ax)\right)}{8a^3c^3}$$

Antiderivative was successfully verified.

[In] Int[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]

[Out] -CosIntegral[4*ArcTan[a*x]]/(8*a^3*c^3) + Log[ArcTan[a*x]]/(8*a^3*c^3)

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} dx &= \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(x)}{x} dx, x, \tan^{-1}(ax)\right)}{a^3c^3} \\
&= \frac{\text{Subst}\left(\int \left(\frac{1}{8x} - \frac{\cos(4x)}{8x}\right) dx, x, \tan^{-1}(ax)\right)}{a^3c^3} \\
&= \frac{\log\left(\tan^{-1}(ax)\right)}{8a^3c^3} - \frac{\text{Subst}\left(\int \frac{\cos(4x)}{x} dx, x, \tan^{-1}(ax)\right)}{8a^3c^3} \\
&= -\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{8a^3c^3} + \frac{\log\left(\tan^{-1}(ax)\right)}{8a^3c^3}
\end{aligned}$$

Mathematica [A] time = 0.07, size = 25, normalized size = 0.76

$$\frac{\log\left(\tan^{-1}(ax)\right)-\text{Ci}\left(4\tan^{-1}(ax)\right)}{8a^3c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
```

```
[Out] (-CosIntegral[4*ArcTan[a*x]] + Log[ArcTan[a*x]])/(8*a^3*c^3)
```

fricas [C] time = 0.47, size = 120, normalized size = 3.64

$$\frac{2\,\log\left(\arctan\left(ax\right)\right)-\text{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)-\text{log\_integral}\left(\frac{a^4x^4-4i\,a^3x^3-6\,a^2x^2+4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)}{16\,a^3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
```

```
[Out] 1/16*(2*log(arctan(a*x)) - log_integral((a^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2
- 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) - log_integral((a^4*x^4 - 4*I*a^3
*x^3 - 6*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)))/(a^3*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.19, size = 30, normalized size = 0.91

$$-\frac{\text{Ci}\left(4\arctan\left(ax\right)\right)}{8a^3c^3}+\frac{\ln\left(\arctan\left(ax\right)\right)}{8a^3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] -1/8*Ci(4*arctan(a*x))/a^3/c^3+1/8*ln(arctan(a*x))/a^3/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^2}{\left(a^2cx^2+c\right)^3\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^2/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{x^2}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^6x^6 \operatorname{atan}(ax)+3a^4x^4 \operatorname{atan}(ax)+3a^2x^2 \operatorname{atan}(ax)+\operatorname{atan}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(x**2/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*at
an(a*x) + atan(a*x)), x)/c**3
```

3.492 $\int \frac{x}{(c+a^2cx^2)^3 \tan^{-1}(ax)}\,dx$

Optimal. Leaf size=35

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{4a^2c^3}+\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{8a^2c^3}$$

```
[Out] 1/4*Si(2*arctan(a*x))/a^2/c^3+1/8*Si(4*arctan(a*x))/a^2/c^3
```

Rubi [A] time = 0.09, antiderivative size = 35, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.150, Rules used = {4970, 4406, 3299}

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{4a^2c^3}+\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{8a^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
```

```
[Out] SinIntegral[2*ArcTan[a*x]]/(4*a^2*c^3) + SinIntegral[4*ArcTan[a*x]]/(8*a^2*
c^3)
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx &= \frac{\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{\sin(2x)}{4x}+\frac{\sin(4x)}{8x}\right)dx, x, \tan^{-1}(ax)\right)}{a^2c^3}\\
&= \frac{\text{Subst}\left(\int \frac{\sin(4x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{8a^2c^3}+\frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{4a^2c^3}\\
&= \frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{4a^2c^3}+\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{8a^2c^3}
\end{aligned}$$

Mathematica [A] time = 0.09, size = 27, normalized size = 0.77

$$\frac{2\text{Si}\left(2\tan^{-1}(ax)\right)+\text{Si}\left(4\tan^{-1}(ax)\right)}{8a^2c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
[Out] (2*SinIntegral[2*ArcTan[a*x]] + SinIntegral[4*ArcTan[a*x]])/(8*a^2*c^3)
```

fricas [C] time = 0.44, size = 171, normalized size = 4.89

$$\frac{i\ \text{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)-i\ \text{log\_integral}\left(\frac{a^4x^4-4i\,a^3x^3-6\,a^2x^2+4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+2i\ \text{log\_integral}\left(-\frac{a^2x^2+}{a^2x}\right.}{16\,a^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
[Out] 1/16*(I*log_integral((a^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4
*x^4 + 2*a^2*x^2 + 1)) - I*log_integral((a^4*x^4 - 4*I*a^3*x^3 - 6*a^2*x^2
+ 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + 2*I*log_integral(-(a^2*x^2 + 2*
I*a*x - 1)/(a^2*x^2 + 1)) - 2*I*log_integral(-(a^2*x^2 - 2*I*a*x - 1)/(a^2*
x^2 + 1)))/(a^2*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.23, size = 32, normalized size = 0.91

$$\frac{\text{Si}\left(2\arctan\left(ax\right)\right)}{4a^2c^3}+\frac{\text{Si}\left(4\arctan\left(ax\right)\right)}{8a^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^3/arctan(a*x),x)
[Out] 1/4*Si(2*arctan(a*x))/a^2/c^3+1/8*Si(4*arctan(a*x))/a^2/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x}{\left(a^2cx^2+c\right)^3\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{x}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^6x^6\,\mathrm{atan}\,(ax)+3a^4x^4\,\mathrm{atan}\,(ax)+3a^2x^2\,\mathrm{atan}\,(ax)+\mathrm{atan}\,(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(x/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*atan(
a*x) + atan(a*x)), x)/c**3
```

3.493 $\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$

Optimal. Leaf size=50

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2ac^3}+\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{8ac^3}+\frac{3\log\left(\tan^{-1}(ax)\right)}{8ac^3}$$

```
[Out] 1/2*Ci(2*arctan(a*x))/a/c^3+1/8*Ci(4*arctan(a*x))/a/c^3+3/8*ln(arctan(a*x))
/a/c^3
```

Rubi [A] time = 0.09, antiderivative size = 50, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.158$, Rules used = {4904, 3312, 3302}

$$\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{2ac^3}+\frac{\text{CosIntegral}\left(4\tan^{-1}(ax)\right)}{8ac^3}+\frac{3\log\left(\tan^{-1}(ax)\right)}{8ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
```

```
[Out] CosIntegral[2*ArcTan[a*x]]/(2*a*c^3) + CosIntegral[4*ArcTan[a*x]]/(8*a*c^3)
 + (3*Log[ArcTan[a*x]])/(8*a*c^3)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx &= \frac{\text{Subst}\left(\int \frac{\cos^4(x)}{x} \, dx, x, \tan^{-1}(ax)\right)}{ac^3}\\
&= \frac{\text{Subst}\left(\int \left(\frac{3}{8x}+\frac{\cos(2x)}{2x}+\frac{\cos(4x)}{8x}\right) \, dx, x, \tan^{-1}(ax)\right)}{ac^3}\\
&= \frac{3\log\left(\tan^{-1}(ax)\right)}{8ac^3}+\frac{\text{Subst}\left(\int \frac{\cos(4x)}{x} \, dx, x, \tan^{-1}(ax)\right)}{8ac^3}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x} \, dx, x, \tan^{-1}(ax)\right)}{2ac^3}\\
&= \frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2ac^3}+\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{8ac^3}+\frac{3\log\left(\tan^{-1}(ax)\right)}{8ac^3}
\end{aligned}$$

Mathematica [A] time = 0.03, size = 34, normalized size = 0.68

$$\frac{4\text{Ci}\left(2\tan^{-1}(ax)\right)+\text{Ci}\left(4\tan^{-1}(ax)\right)+3\log\left(\tan^{-1}(ax)\right)}{8ac^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]
```

```
[Out] (4*CosIntegral[2*ArcTan[a*x]] + CosIntegral[4*ArcTan[a*x]] + 3*Log[ArcTan[a
*x]])/(8*a*c^3)
```

fricas [C] time = 0.46, size = 174, normalized size = 3.48

$$\frac{6\ \log\left(\arctan\left(ax\right)\right)+\log\_integral\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+\log\_integral\left(\frac{a^4x^4-4i\,a^3x^3-6\,a^2x^2+4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+4\ \log\_i}{16\,ac^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
```

```
[Out] 1/16*(6*log(arctan(a*x)) + log_integral((a^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2
- 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + log_integral((a^4*x^4 - 4*I*a^3
*x^3 - 6*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + 4*log_integral
(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 + 1)) + 4*log_integral(-(a^2*x^2 - 2*I*a
*x - 1)/(a^2*x^2 + 1)))/(a*c^3)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.26, size = 45, normalized size = 0.90

$$\frac{\text{Ci}\left(2\arctan\left(ax\right)\right)}{2a\,c^3}+\frac{\text{Ci}\left(4\arctan\left(ax\right)\right)}{8a\,c^3}+\frac{3\ln\left(\arctan\left(ax\right)\right)}{8a\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] 1/2*Ci(2*arctan(a*x))/a/c^3+1/8*Ci(4*arctan(a*x))/a/c^3+3/8*ln(arctan(a*x))
/a/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{1}{\left(a^2cx^2+c\right)^3\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{1}{\mathrm{atan}\left(a\,x\right)\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^6\operatorname{atan}(ax)+3a^4x^4\operatorname{atan}(ax)+3a^2x^2\operatorname{atan}(ax)+\operatorname{atan}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(1/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*atan(
a*x) + atan(a*x)), x)/c**3
```

3.494 $\int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)},x\right)$$

[Out] Unintegrable(1/x/(a^2*c*x^2+c)^3/arctan(a*x),x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

[In] Int[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]),x]

[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]), x]

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx = \int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 0.99, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]),x]

[Out] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]), x]

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")

[Out] integral(1/((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x)*arctan(a*x)), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 1.27, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2} c\, x^{2}+c\right)^{3} \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{{\left(a^{2} c x^{2}+c\right)}^{3} x \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^3*x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{7} \operatorname{atan}{\left(a x \right)} + 3 a^{4} x^{5} \operatorname{atan}{\left(a x \right)} + 3 a^{2} x^{3} \operatorname{atan}{\left(a x \right)} + x \operatorname{atan}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(1/(a**6*x**7*atan(a*x) + 3*a**4*x**5*atan(a*x) + 3*a**2*x**3*atan(
a*x) + x*atan(a*x)), x)/c**3
```

3.495 $\int \frac{1}{x^2(c+a^2cx^2)^3\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^3\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx=\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
[Out] integral(1/((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4 + c^3*x^2)*arctan(
a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a^2c\,x^2+c\right)^3\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^3x^2\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^3*x^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^8\,\mathrm{atan}\left(ax\right)+3a^4x^6\,\mathrm{atan}\left(ax\right)+3a^2x^4\,\mathrm{atan}\left(ax\right)+x^2\,\mathrm{atan}\left(ax\right)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] Integral(1/(a**6*x**8*atan(a*x) + 3*a**4*x**6*atan(a*x) + 3*a**2*x**4*atan(
a*x) + x**2*atan(a*x)), x)/c**3
```

3.496 $\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x],x]
[Out] Defer[Int][(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx=\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 2.25, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x],x]
[Out] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x], x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.60, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{a^{2} c \,x^{2}+c}}{\arctan \left(a x \right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
[Out] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2}+c}\, x}{\arctan \left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*x/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\sqrt{c\,a^2\,x^2+c}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x),x)
[Out] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(1/2)/atan(a*x),x)
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))/atan(a*x), x)
```

3.497 $\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)} dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/ArcTan[a*x],x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)} dx = \int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)} dx$$

Mathematica [A] time = 0.29, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x],x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x], x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.25, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c\,x^{2}+c}}{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
[Out] int((a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2} + c}}{\arctan \left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/atan(a*x),x)
[Out] int((c + a^2*c*x^2)^(1/2)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/atan(a*x),x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/atan(a*x), x)
```

3.498 $\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{x\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/x/arctan(a*x),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]),x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)}\,dx=\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]),x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{x\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/(x*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.66, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c \,x^{2}+c}}{x \arctan \left(a x \right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x),x)
[Out] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2} + c}}{x \arctan \left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x),x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)/(x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{x\,\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)),x)
[Out] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{x \operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/x/atan(a*x),x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/(x*atan(a*x)), x)
```

3.499 $\int \frac{x(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{x\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x],x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 2.34, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x],x]
[Out] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x], x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^2cx^3+cx\right)\sqrt{a^2cx^2+c}}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^2*c*x^3 + c*x)*sqrt(a^2*c*x^2 + c)/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.58, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
[Out] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{3}{2}} x}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x),x)
[Out] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)/atan(a*x), x)
```

3.500 $\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x],x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx=\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.42, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x],x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x], x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.28, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{3}{2}}}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/atan(a*x),x)
```

```
[Out] int((c + a^2*c*x^2)^(3/2)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/atan(a*x),x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/atan(a*x), x)
```

3.501 $\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{x\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/x/arctan(a*x),x)
```

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)}\,dx=\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.47, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]),x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}}{x\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)/(x*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.70, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{x \arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x),x)
[Out] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{3}{2}}}{x \arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)/(x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x\,\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)),x)
[Out] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{x \operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/x/atan(a*x),x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/(x*atan(a*x)), x)
```

3.502 $\int \frac{x(c+a^2cx^2)^{5/2}}{\tan^{-1}(ax)} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x],x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)} \, dx = \int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 2.40, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x],x]
[Out] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x], x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*sqrt(a^2*c*x^2 + c)/arctan(a
*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.75, size = 0, normalized size = 0.00

$$\int \frac{x \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}} x}{\arctan \left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
```

```
[Out] Integral(x*(c*(a**2*x**2 + 1))**(5/2)/atan(a*x), x)
```

3.503 $\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x],x]
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.45, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x],x]
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x], x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)/arctan(a*x
), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.43, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
[Out] int((a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}}}{\arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/atan(a*x),x)
[Out] int((c + a^2*c*x^2)^(5/2)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/atan(a*x),x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)/atan(a*x), x)
```

3.504 $\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\operatorname{Int}\left(\frac{(a^2cx^2+c)^{5/2}}{x\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/x/arctan(a*x),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)}\,dx=\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.46, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]),x]
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]), x]
```

fricas [A] time = 1.35, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{(a^4c^2x^4+2a^2c^2x^2+c^2)\sqrt{a^2cx^2+c}}{x\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)/(x*arctan(
a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.82, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\,x^2+c\right)^{\frac{5}{2}}}{x\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x),x)
[Out] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{5}{2}}}{x\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x),x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)/(x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x\,\mathrm{atan}\left(a\,x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)),x)
[Out] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}{x\,\mathrm{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/x/atan(a*x),x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)/(x*atan(a*x)), x)
```

3.505 $\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Defer[Int][x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx=\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x}{\sqrt{a^2cx^2+c}\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x/(sqrt(a^2*c*x^2 + c)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{x}{\arctan(ax)\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{a^2cx^2+c}\,\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(sqrt(a^2*c*x^2 + c)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\operatorname{atan}(a\,x)\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(x/(atan(a*x)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c\left(a^2x^2+1\right)}\,\operatorname{atan}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)), x)
```

3.506 $\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)} dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c} \tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Defer[Int][1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)} dx = \int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)} dx$$

Mathematica [A] time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\sqrt{a^2cx^2+c} \arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(1/(sqrt(a^2*c*x^2 + c)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{1}{\arctan(ax)\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^2cx^2+c}\,\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\mathrm{atan}(a\,x)\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(atan(a*x)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)), x)
```

3.507 $\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x\sqrt{a^2cx^2+c}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx = \int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.65, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^2cx^3+cx\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^2*c*x^3 + c*x)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.95, size = 0, normalized size = 0.00

$$\int \frac{1}{x \arctan\left(ax\right) \sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^{2} c x^{2}+c}\, x \arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x \operatorname{atan}\left(a\,x\right)\, \sqrt{c\,a^2\,x^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \sqrt{c \left(a^{2} x^{2} + 1\right)}\, \operatorname{atan}{\left(ax \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)), x)
```

3.508 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{x^3}{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx=\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 4.87, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.94, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c\,x^2+c\right)^{\frac{3}{2}} \arctan \left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c x^2+c\right)^{\frac{3}{2}} \arctan \left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^3/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c \left(a^2 x^2+1\right)\right)^{\frac{3}{2}} \operatorname{atan}{\left(a x \right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
```

```
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)), x)
```

3.509 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^2}{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx=\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Mathematica [F] time = 180.00, size = 0, normalized size = 0.00

$Aborted

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] $Aborted
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.85, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2 c\, x^2 + c\right)^{\frac{3}{2}} \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
[Out] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2 c x^2 + c\right)^{\frac{3}{2}} \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^2/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^2}{\mathrm{atan}\left(a\, x\right) \left(c\, a^2\, x^2 + c\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c \left(a^2 x^2 + 1\right)\right)^{\frac{3}{2}} \mathrm{atan}\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)), x)
```

3.510 $\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=39

$$\frac{\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{a^2c\sqrt{a^2cx^2+c}}$$

```
[Out] Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.17, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.136$, Rules used = {4971, 4970, 3299}

$$\frac{\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{a^2c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx &= \frac{\sqrt{1+a^2x^2}\int \frac{x}{\left(1+a^2x^2\right)^{3/2}\tan^{-1}(ax)}\,dx}{c\sqrt{c+a^2cx^2}}\\
&= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^2c\sqrt{c+a^2cx^2}}\\
&= \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{a^2c\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [A] time = 0.12, size = 37, normalized size = 0.95

$$\frac{\left(a^2x^2+1\right)^{3/2}\operatorname{Si}\left(\tan^{-1}(ax)\right)}{a^2\left(c\left(a^2x^2+1\right)\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
```

```
[Out] ((1 + a^2*x^2)^(3/2)*SinIntegral[ArcTan[a*x]])/(a^2*(c*(1 + a^2*x^2))^(3/2)
)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(
a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 0.96, size = 82, normalized size = 2.10

$$-\frac{\operatorname{csgn}(\arctan(ax))\,\pi\sqrt{c\,(ax-i)\,(ax+i)}}{2\sqrt{a^2x^2+1}\;c^2a^2}+\frac{\operatorname{Si}(\arctan(ax))\sqrt{c\,(ax-i)\,(ax+i)}}{\sqrt{a^2x^2+1}\;c^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

```
[Out] -1/2*csgn(arctan(a*x))*Pi/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2/a
^2+Si(arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^2/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{x}{\operatorname{atan}(a\,x)\,\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x/(atan(a*x)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
```

```
[Out] Integral(x/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)), x)
```

3.511 $\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=39

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{ac\sqrt{a^2cx^2+c}}$$

```
[Out] Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 39, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4905, 4904, 3302}

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{CosIntegral}\left(\tan^{-1}(ax)\right)}{ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(a*c*Sqrt[c + a^2*c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] && !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx &= \frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\tan^{-1}(ax)}\,dx}{c\sqrt{c+a^2cx^2}}\\
&= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{ac\sqrt{c+a^2cx^2}}\\
&= \frac{\sqrt{1+a^2x^2}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{ac\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [A] time = 0.05, size = 37, normalized size = 0.95

$$\frac{\left(a^2x^2+1\right)^{3/2}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{a\left(c\left(a^2x^2+1\right)\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] ((1 + a^2*x^2)^(3/2)*CosIntegral[ArcTan[a*x]])/(a*(c*(1 + a^2*x^2))^(3/2))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*
x)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [C] time = 0.63, size = 136, normalized size = 3.49

$$-\frac{i\mathrm{csgn}\left(\arctan\left(ax\right)\right)\mathrm{csgn}\left(i\arctan\left(ax\right)\right)\pi\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\sqrt{a^2x^2+1}\;c^2a}+\frac{i\mathrm{csgn}\left(i\arctan\left(ax\right)\right)\pi\sqrt{c\left(ax-i\right)\left(ax+i\right)}}{2\sqrt{a^2x^2+1}\;c^2a}+\frac{\mathrm{Ci}\left(a\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
[Out] -1/2*I*csgn(arctan(a*x))*csgn(I*arctan(a*x))*Pi/(a^2*x^2+1)^(1/2)*(c*(a*x-I
)*(I+a*x))^(1/2)/c^2/a+1/2*I*csgn(I*arctan(a*x))*Pi/(a^2*x^2+1)^(1/2)*(c*(a
*x-I)*(I+a*x))^(1/2)/c^2/a+Ci(arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+
a*x))^(1/2)/c^2/a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int\frac{1}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(atan(a*x)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)), x)
```

3.512 $\int \frac{1}{x(c+a^2cx^2)^{3/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)},x\right)$$

[Out] Unintegrable(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]

[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]

[Out] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*arctan(a*x)), x)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2} c\, x^{2}+c\right)^{\frac{3}{2}} \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2} c x^{2}+c\right)^{\frac{3}{2}} x \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\, \mathrm{atan}\left(a\, x\right)\, {\left(c\, a^{2}\, x^{2}+c\right)}^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(c \left(a^{2} x^{2}+1\right)\right)^{\frac{3}{2}} \operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)), x)
```

3.513 $\int \frac{1}{x^2(c+a^2cx^2)^{3/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx=\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^6+2\,a^2c^2x^4+c^2x^2\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arcta
n(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.09, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c\,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
[Out] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{{\left(a^{2} c x^{2} + c\right)}^{\frac{3}{2}} x^{2} \arctan\left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
[Out] Integral(1/(x**2*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)), x)
```

3.514 $\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^5}{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx=\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 5.90, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Integrate[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^5}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^5/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 5.33, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2 c\,x^2+c\right)^{\frac{5}{2}} \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
[Out] int(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2 c x^2+c\right)^{\frac{5}{2}} \arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^5/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^5}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^5/(atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{5}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
[Out] Integral(x**5/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.515 $\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{x^4}{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx=\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 101.32, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^4}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^4/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.60, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
[Out] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^4/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^4}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^4/(atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
[Out] Integral(x**4/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.516 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=87

$$\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 3/4*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-1/4*Si(3*
arctan(a*x))*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.28, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4971, 4970, 3312, 3299}

$$\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
```

```
[Out] (3*Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(4*a^4*c^2*Sqrt[c + a^2*c*x^
2]) - (Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/(4*a^4*c^2*Sqrt[c + a^
2*c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x^3}{\left(1+a^2x^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin^3(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{3\sin(x)}{4x}-\frac{\sin(3x)}{4x}\right)dx, x, \tan^{-1}(ax)\right)}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{4a^4c^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\sin(x}{x} \right.}{4a^4c^2\sqrt{c+a^2}}$$

$$= \frac{3\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(3\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.15, size = 52, normalized size = 0.60

$$\frac{\left(a^2x^2+1\right)^{5/2}\left(3\text{Si}\left(\tan^{-1}(ax)\right)-\text{Si}\left(3\tan^{-1}(ax)\right)\right)}{4a^4\left(c\left(a^2x^2+1\right)\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
```

```
[Out] ((1 + a^2*x^2)^(5/2)*(3*SinIntegral[ArcTan[a*x]] - SinIntegral[3*ArcTan[a*x
]]))/(4*a^4*(c*(1 + a^2*x^2))^(5/2))
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 2.68, size = 125, normalized size = 1.44

$$-\frac{\text{csgn}\left(\arctan(ax)\right)\pi\sqrt{c\,(ax-i)\,(ax+i)}}{4\sqrt{a^2x^2+1}\;c^3a^4} - \frac{\text{Si}\left(3\arctan(ax)\right)\sqrt{c\,(ax-i)\,(ax+i)}}{4\sqrt{a^2x^2+1}\;c^3a^4} + \frac{3\,\text{Si}\left(\arctan(ax)\right)\sqrt{c\,(ax-i}}{4\sqrt{a^2x^2+1}\;c^3a^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

```
[Out] -1/4*csgn(arctan(a*x))*Pi/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a
^4-1/4*Si(3*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^
4+3/4*Si(arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^3/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^3/(atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
```

```
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.517 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=87

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(3\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/4*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)-1/4*Ci(3*
arctan(a*x))*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4971, 4970, 4406, 3302}

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{CosIntegral}\left(\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{a^2x^2+1}\,\mathrm{CosIntegral}\left(3\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(4*a^3*c^2*Sqrt[c + a^2*c*x^2]
) - (Sqrt[1 + a^2*x^2]*CosIntegral[3*ArcTan[a*x]])/(4*a^3*c^2*Sqrt[c + a^2*
c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x^2}{\left(1+a^2x^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^3c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{\cos(x)}{4x}-\frac{\cos(3x)}{4x}\right)dx, x, \tan^{-1}(ax)\right)}{a^3c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{4a^3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x,\right.}{4a^3c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(3\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.12, size = 53, normalized size = 0.61

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(\text{Ci}\left(\tan^{-1}(ax)\right)-\text{Ci}\left(3\tan^{-1}(ax)\right)\right)}{4a^3c^3\sqrt{a^2x^2+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] (Sqrt[c*(1 + a^2*x^2)]*(CosIntegral[ArcTan[a*x]] - CosIntegral[3*ArcTan[a*x
]]))/(4*a^3*c^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [C] time = 3.59, size = 84, normalized size = 0.97

$$-\frac{\text{Ci}\left(3\arctan(ax)\right)\sqrt{c\,(ax-i)\,(ax+i)}}{4\sqrt{a^2x^2+1}\;c^3a^3}+\frac{\text{Ci}\left(\arctan(ax)\right)\sqrt{c\,(ax-i)\,(ax+i)}}{4\sqrt{a^2x^2+1}\;c^3a^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

```
[Out] -1/4*Ci(3*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^3+
1/4*Ci(arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^2/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^2/(atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
```

```
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.518 $\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=87

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/4*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)+1/4*Si(3*
arctan(a*x))*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4971, 4970, 4406, 3299}

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
```

```
[Out] (Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(4*a^2*c^2*Sqrt[c + a^2*c*x^2]
) + (Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/(4*a^2*c^2*Sqrt[c + a^2*
c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x}{\left(1+a^2x^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{a^2c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{\sin(x)}{4x}+\frac{\sin(3x)}{4x}\right)dx,x,\tan^{-1}(ax)\right)}{a^2c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(3x)}{x}\,dx,\right.}{4a^2c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(3\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.14, size = 51, normalized size = 0.59

$$\frac{\sqrt{c\left(a^2x^2+1\right)}\left(\text{Si}\left(\tan^{-1}(ax)\right)+\text{Si}\left(3\tan^{-1}(ax)\right)\right)}{4a^2c^3\sqrt{a^2x^2+1}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
```

```
[Out] (Sqrt[c*(1 + a^2*x^2)]*(SinIntegral[ArcTan[a*x]] + SinIntegral[3*ArcTan[a*x
]]))/(4*a^2*c^3*Sqrt[1 + a^2*x^2])
```

fricas [F] time = 0.72, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^
2 + c^3)*arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 0.97, size = 125, normalized size = 1.44

$$-\frac{\text{csgn}\left(\arctan(ax)\right)\pi\sqrt{c\,(ax-i)\,(ax+i)}}{4\sqrt{a^2x^2+1}\;c^3a^2}+\frac{\text{Si}\left(3\arctan(ax)\right)\sqrt{c\,(ax-i)\,(ax+i)}}{4\sqrt{a^2x^2+1}\;c^3a^2}+\frac{\text{Si}\left(\arctan(ax)\right)\sqrt{c\,(ax-i)\,(}}{4\sqrt{a^2x^2+1}\;c^3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

```
[Out] -1/4*csgn(arctan(a*x))*Pi/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a
^2+1/4*Si(3*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^
2+1/4*Si(arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/c^3/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x/(atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
```

```
[Out] Integral(x/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.519 $\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=87

$$\frac{3\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(3\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}$$

```
[Out] 3/4*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)+1/4*Ci(3*ar
ctan(a*x))*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.13, antiderivative size = 87, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.190$, Rules used = {4905, 4904, 3312, 3302}

$$\frac{3\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(3\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
```

```
[Out] (3*Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(4*a*c^2*Sqrt[c + a^2*c*x^2]
) + (Sqrt[1 + a^2*x^2]*CosIntegral[3*ArcTan[a*x]])/(4*a*c^2*Sqrt[c + a^2*c*
x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\ \mathrm{Subst}\left(\int \frac{\cos^3(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{ac^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\ \mathrm{Subst}\left(\int \left(\frac{3\cos(x)}{4x}+\frac{\cos(3x)}{4x}\right)dx, x, \tan^{-1}(ax)\right)}{ac^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\ \mathrm{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{4ac^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \frac{\cos(x)}{x}\,dx\right.}{4ac^2\sqrt{c+a^2cx^2}}$$

$$= \frac{3\sqrt{1+a^2x^2}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{4ac^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\,\mathrm{Ci}\left(3\tan^{-1}(ax)\right)}{4ac^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.05, size = 50, normalized size = 0.57

$$\frac{\left(a^2x^2+1\right)^{5/2}\left(3\mathrm{Ci}\left(\tan^{-1}(ax)\right)+\mathrm{Ci}\left(3\tan^{-1}(ax)\right)\right)}{4a\left(c\left(a^2x^2+1\right)\right)^{5/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
```

```
[Out] ((1 + a^2*x^2)^(5/2)*(3*CosIntegral[ArcTan[a*x]] + CosIntegral[3*ArcTan[a*x
]]))/(4*a*(c*(1 + a^2*x^2))^(5/2))
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan(ax)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2
+ c^3)*arctan(a*x)), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.64, size = 179, normalized size = 2.06

$$-\frac{i\mathrm{csgn}\left(\arctan(ax)\right)\mathrm{csgn}\left(i\arctan(ax)\right)\pi\sqrt{c\,(ax-i)\,(ax+i)}}{2\sqrt{a^2x^2+1}\;a\,c^3}+\frac{i\mathrm{csgn}\left(i\arctan(ax)\right)\pi\sqrt{c\,(ax-i)\,(ax+i)}}{2\sqrt{a^2x^2+1}\;a\,c^3}+\mathrm{Ci}\,(3$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

```
[Out] -1/2*I*csgn(arctan(a*x))*csgn(I*arctan(a*x))*Pi/(a^2*x^2+1)^(1/2)*(c*(a*x-I
)*(I+a*x))^(1/2)/a/c^3+1/2*I*csgn(I*arctan(a*x))*Pi/(a^2*x^2+1)^(1/2)*(c*(a
*x-I)*(I+a*x))^(1/2)/a/c^3+1/4*Ci(3*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-
I)*(I+a*x))^(1/2)/a/c^3+3/4*Ci(arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I
+a*x))^(1/2)/a/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.520 $\int \frac{1}{x(c+a^2cx^2)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3
+ c^3*x)*arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}} x \arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x*atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.521 $\int \frac{1}{x^2(c+a^2cx^2)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Defer[Int][1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx=\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4
+ c^3*x^2)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
[Out] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{{\left(a^{2} c x^{2} + c\right)}^{\frac{5}{2}} x^{2} \arctan \left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(1/(x^2*atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
[Out] Integral(1/(x**2*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)), x)
```

3.522 $\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3/arctan(a*x),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x], x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m}{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m/arctan(a*x
), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.54, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2 + c\right)^3}{\arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c x^2 + c\right)^3 x^m}{\arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^3*x^m/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^3}{\mathrm{atan}\left(a\, x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3 \left(\int \frac{x^m}{\mathrm{atan}\left(ax\right)}\, dx + \int \frac{3a^2x^2x^m}{\mathrm{atan}\left(ax\right)}\, dx + \int \frac{3a^4x^4x^m}{\mathrm{atan}\left(ax\right)}\, dx + \int \frac{a^6x^6x^m}{\mathrm{atan}\left(ax\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3/atan(a*x),x)
```

```
[Out] c**3*(Integral(x**m/atan(a*x), x) + Integral(3*a**2*x**2*x**m/atan(a*x), x)
 + Integral(3*a**4*x**4*x**m/atan(a*x), x) + Integral(a**6*x**6*x**m/atan(a
*x), x))
```

3.523 $\int \frac{x^m \left(c+a^2 c x^2\right)^2}{\tan^{-1}(ax)} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m \left(a^2 c x^2+c\right)^2}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2/arctan(a*x),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \left(c+a^2 c x^2\right)^2}{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x^m \left(c+a^2 c x^2\right)^2}{\tan^{-1}(ax)} \, dx=\int \frac{x^m \left(c+a^2 c x^2\right)^2}{\tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 0.86, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(c+a^2 c x^2\right)^2}{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x], x]
```

fricas [A] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4 c^2 x^4+2\,a^2 c^2 x^2+c^2\right) x^m}{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.43, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2 + c\right)^2}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c x^2 + c\right)^2 x^m}{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^2*x^m/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^2}{\mathrm{atan}\left(a\, x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2 \left(\int \frac{x^m}{\mathrm{atan}\left(a x\right)}\, dx + \int \frac{2 a^2 x^2 x^m}{\mathrm{atan}\left(a x\right)}\, dx + \int \frac{a^4 x^4 x^m}{\mathrm{atan}\left(a x\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2/atan(a*x),x)
```

```
[Out] c**2*(Integral(x**m/atan(a*x), x) + Integral(2*a**2*x**2*x**m/atan(a*x), x)
 + Integral(a**4*x**4*x**m/atan(a*x), x))
```

3.524 $\int \frac{x^m(c+a^2cx^2)}{\tan^{-1}(ax)} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2))/ArcTan[a*x],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2))/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)} dx = \int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)} dx$$

Mathematica [A] time = 0.56, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x], x]
```

fricas [A] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)x^m}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m/arctan(a*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)}{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)/arctan(a*x),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2} + c\right)x^{m}}{\arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)*x^m/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\left(c\,a^2\,x^2+c\right)}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2))/atan(a*x),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2))/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x^{m}}{\operatorname{atan}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{2} x^{m}}{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)/atan(a*x),x)
```

```
[Out] c*(Integral(x**m/atan(a*x), x) + Integral(a**2*x**2*x**m/atan(a*x), x))
```

3.525 $\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)/arctan(a*x),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.68, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^2cx^2+c\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="fricas")
[Out] integral(x^m/((a^2*c*x^2 + c)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c\,x^{2}+c\right) \arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)/arctan(a*x),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c x^{2}+c\right) \arctan \left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^m/((a^2*c*x^2 + c)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^{m}}{\mathrm{atan}\left(a\,x\right)\,\left(c\,a^{2}\,x^{2}+c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^m/(atan(a*x)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{2} x^{2} \operatorname{atan}{\left(a x \right)} + \operatorname{atan}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)/atan(a*x),x)
```

```
[Out] Integral(x**m/(a**2*x**2*atan(a*x) + atan(a*x)), x)/c
```

3.526 $\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)}\, dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^2 \tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)}\, dx = \int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)}\, dx$$

Mathematica [A] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]), x]
```

fricas [A] time = 0.63, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="fricas")
[Out] integral(x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.42, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x),x)
[Out] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{{\left(a^{2} c x^{2} + c\right)}^{2} \arctan \left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^m/((a^2*c*x^2 + c)^2*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^2),x)
[Out] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{4} x^{4} \operatorname{atan}{\left (a x \right)} + 2 a^{2} x^{2} \operatorname{atan}{\left (a x \right)} + \operatorname{atan}{\left (a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**2/atan(a*x),x)
[Out] Integral(x**m/(a**4*x**4*atan(a*x) + 2*a**2*x**2*atan(a*x) + atan(a*x)), x)
/c**2
```

3.527 $\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^3\tan^{-1}(ax)},x\right)$$

[Out] Unintegrable(x^m/(a^2*c*x^2+c)^3/arctan(a*x),x)

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]

[Out] Defer[Int][x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]), x]

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.50, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]), x]

fricas [A] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="fricas")

[Out] integral(x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="giac")

```
[Out] Timed out
```

maple [A] time = 1.56, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right)^3 \arctan(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x),x)
[Out] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c x^2 + c\right)^3 \arctan(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^m/((a^2*c*x^2 + c)^3*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\, x\right) \left(c\, a^2\, x^2 + c\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^3),x)
[Out] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m}{a^6 x^6 \operatorname{atan}(ax) + 3 a^4 x^4 \operatorname{atan}(ax) + 3 a^2 x^2 \operatorname{atan}(ax) + \operatorname{atan}(ax)}\, dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**3/atan(a*x),x)
[Out] Integral(x**m/(a**6*x**6*atan(a*x) + 3*a**4*x**4*atan(a*x) + 3*a**2*x**2*at
an(a*x) + atan(a*x)), x)/c**3
```

3.528 $\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x],x]
```

```
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.51, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x],x]
```

```
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x], x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m}{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m/arctan
(a*x), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.03, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(a^{2} c x^{2} + c\right)}^{\frac{5}{2}} x^{m}}{\arctan\left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^m/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
```

```
[Out] Timed out
```

3.529 $\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \left(a^2 c x^2+c\right)^{3/2}}{\tan^{-1}(a x)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \left(c+a^2 c x^2\right)^{3/2}}{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x^m \left(c+a^2 c x^2\right)^{3/2}}{\tan^{-1}(a x)} \, dx=\int \frac{x^m \left(c+a^2 c x^2\right)^{3/2}}{\tan^{-1}(a x)} \, dx$$

Mathematica [A] time = 0.81, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(c+a^2 c x^2\right)^{3/2}}{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x], x]
```

fricas [A] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2 c x^2+c\right)^{\frac{3}{2}} x^m}{\arctan\left(a x\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.01, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(a^{2} c x^{2} + c\right)}^{\frac{3}{2}} x^{m}}{\arctan\left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
```

```
[Out] Integral(x**m*(c*(a**2*x**2 + 1))**(3/2)/atan(a*x), x)
```

3.530 $\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x],x]
[Out] Defer[Int][(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x], x]
```

Rubi steps

$$\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx=\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x],x]
[Out] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x], x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.06, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{a^{2} c \,x^{2}+c}}{\arctan \left(a x \right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2} + c} x^{m}}{\arctan \left(a x\right)}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\sqrt{c\,a^2\,x^2+c}}{\mathrm{atan}\left(a\,x\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x),x)
[Out] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)/atan(a*x),x)
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))/atan(a*x), x)
```

3.531 $\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Defer[Int][x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx = \int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.51, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]),x]
[Out] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]
```

fricas [A] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.59, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\arctan(ax)\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{a^2cx^2+c}\,\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}(a\,x)\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/atan(a*x)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)), x)
```

3.532 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.58, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.69, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\,x^2+c\right)^{\frac{3}{2}} \arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c x^2+c\right)^{\frac{3}{2}} \arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x),x, algorithm="maxima")
```

```
[Out] integrate(x^m/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}} \operatorname{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(3/2)/atan(a*x),x)
```

```
[Out] Integral(x**m/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)), x)
```

3.533 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.63, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]), x]
```

fricas [A] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
[Out] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x),x, algorithm="maxima")
[Out] integrate(x^m/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^m/(atan(a*x)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(5/2)/atan(a*x),x)
[Out] Timed out
```

3.534 $\int \frac{x(c+a^2cx^2)}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=21

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^2},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)/arctan(a*x)^2,x)

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2))/ArcTan[a*x]^2,x]

[Out] Defer[Int][(x*(c + a^2*c*x^2))/ArcTan[a*x]^2, x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx=\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^2,x]

[Out] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^2, x]

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2cx^3+cx}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")

[Out] integral((a^2*c*x^3 + c*x)/arctan(a*x)^2, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.57, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)}{\arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int(x*(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{4} c x^{5}+2\,a^{2} c x^{3}-sage_{0} x \arctan\left(a x\right)+c x}{a \arctan\left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^4*c*x^5 + 2*a^2*c*x^3 + c*x - arctan(a*x)*integrate((5*a^4*c*x^4 + 6*a^
2*c*x^2 + c)/arctan(a*x), x))/(a*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{x\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2))/atan(a*x)^2,x)
```

```
[Out] int((x*(c + a^2*c*x^2))/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{3}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] c*(Integral(x/atan(a*x)**2, x) + Integral(a**2*x**3/atan(a*x)**2, x))
```

3.535 $\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^2} dx$

Optimal. Leaf size=20

$$\text{Int}\left(\frac{a^2cx^2+c}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/ArcTan[a*x]^2,x]
[Out] Defer[Int][(c + a^2*c*x^2)/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^2} dx = \int \frac{c+a^2cx^2}{\tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 0.58, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^2,x]
[Out] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2cx^2+c}{\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)/arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.52, size = 0, normalized size = 0.00

$$\int \frac{a^2c\,x^2+c}{\arctan(ax)^2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int((a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^4cx^4 + 2\,a^2cx^2 - 4\,a\arctan\left(ax\right)\int\frac{a^3cx^3+acx}{\arctan(ax)}\,dx + c}{a\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^4*c*x^4 + 2*a^2*c*x^2 - a*arctan(a*x)*integrate(4*(a^3*c*x^3 + a*c*x)/a
rctan(a*x), x) + c)/(a*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{c\,a^2\,x^2+c}{{\mathrm{atan}\left(a\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/atan(a*x)^2,x)
```

```
[Out] int((c + a^2*c*x^2)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int\frac{a^2x^2}{\operatorname{atan}^2\left(ax\right)}\,dx+\int\frac{1}{\operatorname{atan}^2\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] c*(Integral(a**2*x**2/atan(a*x)**2, x) + Integral(atan(a*x)**(-2), x))
```

3.536 $\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=23

$$\operatorname{Int}\left(\frac{a^2cx^2+c}{x\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/x/arctan(a*x)^2,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/(x*ArcTan[a*x]^2),x]
[Out] Defer[Int][(c + a^2*c*x^2)/(x*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^2}\,dx=\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^2),x]
[Out] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{a^2cx^2+c}{x\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)/(x*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.08, size = 0, normalized size = 0.00

$$\int \frac{a^2c\,x^2+c}{x\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/x/arctan(a*x)^2,x)
```

```
[Out] int((a^2*c*x^2+c)/x/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^4cx^4 + 2\,a^2cx^2 - sage_0x^2\arctan\left(ax\right) + c}{ax\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^4*c*x^4 + 2*a^2*c*x^2 - x*arctan(a*x)*integrate((3*a^4*c*x^4 + 2*a^2*c*
x^2 - c)/(x^2*arctan(a*x)), x) + c)/(a*x*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{c\,a^2\,x^2+c}{x\,\mathrm{atan}\left(a\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/(x*atan(a*x)^2),x)
```

```
[Out] int((c + a^2*c*x^2)/(x*atan(a*x)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int\frac{1}{x\,\mathrm{atan}^2\left(ax\right)}\,dx + \int\frac{a^2x}{\mathrm{atan}^2\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/x/atan(a*x)**2,x)
```

```
[Out] c*(Integral(1/(x*atan(a*x)**2), x) + Integral(a**2*x/atan(a*x)**2, x))
```

3.537 $\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^2}, x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2,x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx = \int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2,x]
[Out] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^4c^2x^5 + 2\,a^2c^2x^3 + c^2x}{\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)/arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{x \left(a^{2} c \,x^{2}+c \right)^{2}}{\arctan \left(a x \right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{6} c^{2} x^{7} + 3 \, a^{4} c^{2} x^{5} + 3 \, a^{2} c^{2} x^{3} + c^{2} x - sage_{0} x \arctan \left(a x\right)}{a \arctan \left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^6*c^2*x^7 + 3*a^4*c^2*x^5 + 3*a^2*c^2*x^3 + c^2*x - arctan(a*x)*integra
te((7*a^6*c^2*x^6 + 15*a^4*c^2*x^4 + 9*a^2*c^2*x^2 + c^2)/arctan(a*x), x))/
(a*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^2,x)
```

```
[Out] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x^{3}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{5}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] c**2*(Integral(x/atan(a*x)**2, x) + Integral(2*a**2*x**3/atan(a*x)**2, x) +
 Integral(a**4*x**5/atan(a*x)**2, x))
```

3.538 $\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{(a^2cx^2+c)^2}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/ArcTan[a*x]^2,x]
[Out] Defer[Int][(c + a^2*c*x^2)^2/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^2}\,dx = \int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^2,x]
[Out] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^4c^2x^4+2\,a^2c^2x^2+c^2}{\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)/arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{2}}{\arctan \left(a x\right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

```
[Out] int((a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{6} c^{2} x^{6} + 3\,a^{4} c^{2} x^{4} + 3\,a^{2} c^{2} x^{2} - 6\,a \arctan\left(ax\right) \int \frac{a^{5} c^{2} x^{5} + 2\,a^{3} c^{2} x^{3} + a c^{2} x}{\arctan(ax)}\,dx + c^{2}}{a \arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^6*c^2*x^6 + 3*a^4*c^2*x^4 + 3*a^2*c^2*x^2 - a*arctan(a*x)*integrate(6*(
a^5*c^2*x^5 + 2*a^3*c^2*x^3 + a*c^2*x)/arctan(a*x), x) + c^2)/(a*arctan(a*x
))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\left(c\,a^2\,x^2+c\right)^2}{\mathrm{atan}\left(a\,x\right)^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/atan(a*x)^2,x)
```

```
[Out] int((c + a^2*c*x^2)^2/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{2 a^{2} x^{2}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{4}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{1}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] c**2*(Integral(2*a**2*x**2/atan(a*x)**2, x) + Integral(a**4*x**4/atan(a*x)*
*2, x) + Integral(atan(a*x)**(-2), x))
```

3.539 $\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\operatorname{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{x\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/x/arctan(a*x)^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^2),x]
[Out] Defer[Int][(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^2}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^2),x]
[Out] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{a^4c^2x^4+2\,a^2c^2x^2+c^2}{x\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)/(x*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{2}}{x \arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/x/arctan(a*x)^2,x)
[Out] int((a^2*c*x^2+c)^2/x/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{6} c^{2} x^{6}+3\,a^{4} c^{2} x^{4}+3\,a^{2} c^{2} x^{2}-sage_{0} x^{2} \arctan\left(a x\right)+c^{2}}{a x \arctan\left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^2,x, algorithm="maxima")
[Out] -(a^6*c^2*x^6 + 3*a^4*c^2*x^4 + 3*a^2*c^2*x^2 - x*arctan(a*x)*integrate((5*
a^6*c^2*x^6 + 9*a^4*c^2*x^4 + 3*a^2*c^2*x^2 - c^2)/(x^2*arctan(a*x)), x) +
c^2)/(a*x*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\,a^{2}\,x^{2}+c\right)^{2}}{x\,\mathrm{atan}\left(a\,x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/(x*atan(a*x)^2),x)
[Out] int((c + a^2*c*x^2)^2/(x*atan(a*x)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{1}{x \operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{3}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/x/atan(a*x)**2,x)
[Out] c**2*(Integral(1/(x*atan(a*x)**2), x) + Integral(2*a**2*x/atan(a*x)**2, x)
+ Integral(a**4*x**3/atan(a*x)**2, x))
```

3.540 $\int \frac{x(c+a^2cx^2)^3}{\tan^{-1}(ax)^2} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^2},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)^3/arctan(a*x)^2,x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2,x]

[Out] Defer[Int][(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2, x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2} dx = \int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 1.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2,x]

[Out] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2, x]

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")

[Out] integral((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x)/arctan(a*x)^2, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 2.09, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^2 c\,x^2+c\right)^3}{\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^8c^3x^9+4\,a^6c^3x^7+6\,a^4c^3x^5+4\,a^2c^3x^3+c^3x-sage_0x\arctan\left(ax\right)}{a\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^8*c^3*x^9 + 4*a^6*c^3*x^7 + 6*a^4*c^3*x^5 + 4*a^2*c^3*x^3 + c^3*x - arc
tan(a*x)*integrate((9*a^8*c^3*x^8 + 28*a^6*c^3*x^6 + 30*a^4*c^3*x^4 + 12*a^
2*c^3*x^2 + c^3)/arctan(a*x), x))/(a*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\left(c\,a^2\,x^2+c\right)^3}{\mathrm{atan}\left(a\,x\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^2,x)
```

```
[Out] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int \frac{x}{\operatorname{atan}^2\left(ax\right)}\,dx+\int \frac{3a^2x^3}{\operatorname{atan}^2\left(ax\right)}\,dx+\int \frac{3a^4x^5}{\operatorname{atan}^2\left(ax\right)}\,dx+\int \frac{a^6x^7}{\operatorname{atan}^2\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] c**3*(Integral(x/atan(a*x)**2, x) + Integral(3*a**2*x**3/atan(a*x)**2, x) +
 Integral(3*a**4*x**5/atan(a*x)**2, x) + Integral(a**6*x**7/atan(a*x)**2, x
))
```

3.541 $\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/ArcTan[a*x]^2,x]
[Out] Defer[Int][(c + a^2*c*x^2)^3/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx=\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^2,x]
[Out] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)/arctan(a*x)^2,
 x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\, x^2 + c\right)^3}{\arctan\left(ax\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] int((a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^8c^3x^8 + 4\,a^6c^3x^6 + 6\,a^4c^3x^4 + 4\,a^2c^3x^2 + c^3 - 8\,a\arctan\left(ax\right)\int \frac{a^7c^3x^7+3\,a^5c^3x^5+3\,a^3c^3x^3+ac^3x}{\arctan(ax)}\,dx}{a\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2 + c^3 - a*arc
tan(a*x)*integrate(8*(a^7*c^3*x^7 + 3*a^5*c^3*x^5 + 3*a^3*c^3*x^3 + a*c^3*x
)/arctan(a*x), x))/(a*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\left(c\,a^2\,x^2 + c\right)^3}{\mathrm{atan}\left(a\,x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/atan(a*x)^2,x)
```

```
[Out] int((c + a^2*c*x^2)^3/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int \frac{3a^2x^2}{\operatorname{atan}^2\left(ax\right)}\, dx + \int \frac{3a^4x^4}{\operatorname{atan}^2\left(ax\right)}\, dx + \int \frac{a^6x^6}{\operatorname{atan}^2\left(ax\right)}\, dx + \int \frac{1}{\operatorname{atan}^2\left(ax\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] c**3*(Integral(3*a**2*x**2/atan(a*x)**2, x) + Integral(3*a**4*x**4/atan(a*x
)**2, x) + Integral(a**6*x**6/atan(a*x)**2, x) + Integral(atan(a*x)**(-2),
x))
```

3.542 $\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a^2cx^2+c)^3}{x\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/x/arctan(a*x)^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^2),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^2}\,dx=\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 1.22, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3}{x\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)/(x*arctan(a*x)
^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.97, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{3}}{x \arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/x/arctan(a*x)^2,x)
```

```
[Out] int((a^2*c*x^2+c)^3/x/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{8} c^{3} x^{8}+4\,a^{6} c^{3} x^{6}+6\,a^{4} c^{3} x^{4}+4\,a^{2} c^{3} x^{2}-sage_{0} x^{2} \arctan\left(a x\right)+c^{3}}{a x \arctan\left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2 + c^3 - x*arc
tan(a*x)*integrate((7*a^8*c^3*x^8 + 20*a^6*c^3*x^6 + 18*a^4*c^3*x^4 + 4*a^2
*c^3*x^2 - c^3)/(x^2*arctan(a*x)), x))/(a*x*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\,a^{2}\,x^{2}+c\right)^{3}}{x\,\mathrm{atan}\left(a\,x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/(x*atan(a*x)^2),x)
```

```
[Out] int((c + a^2*c*x^2)^3/(x*atan(a*x)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{1}{x \operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{3}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{5}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/x/atan(a*x)**2,x)
```

```
[Out] c**3*(Integral(1/(x*atan(a*x)**2), x) + Integral(3*a**2*x/atan(a*x)**2, x)
+ Integral(3*a**4*x**3/atan(a*x)**2, x) + Integral(a**6*x**5/atan(a*x)**2,
x))
```

3.543 $\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=39

$$\frac{3\mathrm{Int}\left(\frac{x^2}{\tan^{-1}(ax)},x\right)}{ac}-\frac{x^3}{ac\tan^{-1}(ax)}$$

```
[Out] -x^3/a/c/arctan(a*x)+3*Unintegrable(x^2/arctan(a*x),x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] -(x^3/(a*c*ArcTan[a*x])) + (3*Defer[Int][x^2/ArcTan[a*x], x])/(a*c)
```

Rubi steps

$$\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx=-\frac{x^3}{ac\tan^{-1}(ax)}+\frac{3\int \frac{x^2}{\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^3}{(a^2cx^2+c)\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(x^3/((a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.80, size = 0, normalized size = 0.00

$$\int \frac{x^{3}}{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{x^{3}-3 \, sage_{0} x \arctan \left(a x\right)}{a c \arctan \left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(x^3 - 3*arctan(a*x)*integrate(x^2/arctan(a*x), x))/(a*c*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^3}{{\mathrm{atan}\left(a\,x\right)}^2\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3}}{a^{2} x^{2} \operatorname{atan}^{2}{\left(a x \right)} + \operatorname{atan}^{2}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] Integral(x**3/(a**2*x**2*atan(a*x)**2 + atan(a*x)**2), x)/c
```

3.544 $\int \frac{x^2}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=37

$$\frac{2\text{Int}\left(\frac{x}{\tan^{-1}(ax)},x\right)}{ac}-\frac{x^2}{ac\tan^{-1}(ax)}$$

```
[Out] -x^2/a/c/arctan(a*x)+2*Unintegrable(x/arctan(a*x),x)/a/c
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] -(x^2/(a*c*ArcTan[a*x])) + (2*Defer[Int][x/ArcTan[a*x], x])/(a*c)
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx=-\frac{x^2}{ac\tan^{-1}(ax)}+\frac{2\int \frac{x}{\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] Integrate[x^2/((c + a^2*c*x^2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^2}{\left(a^2cx^2+c\right)\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(x^2/((a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2 c\, x^2 + c\right) \arctan\left(ax\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{-2\, sage_0 x \arctan\left(ax\right) + x^2}{ac \arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(x^2 - 2*arctan(a*x)*integrate(x/arctan(a*x), x))/(a*c*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{\mathrm{atan}\left(a\, x\right)^2 \left(c\, a^2\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^2 x^2 \operatorname{atan}^2\left(ax\right) + \operatorname{atan}^2\left(ax\right)}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] Integral(x**2/(a**2*x**2*atan(a*x)**2 + atan(a*x)**2), x)/c
```

3.545 $\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=32

$$\frac{\text{Int}\left(\frac{1}{\tan^{-1}(ax)},x\right)}{ac}-\frac{x}{ac\tan^{-1}(ax)}$$

```
[Out] -x/a/c/arctan(a*x)+Unintegrable(1/arctan(a*x),x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] -(x/(a*c*ArcTan[a*x])) + Defer[Int][ArcTan[a*x]^(-1), x]/(a*c)
```

Rubi steps

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx=-\frac{x}{ac\tan^{-1}(ax)}+\frac{\int \frac{1}{\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 0.30, size = 0, normalized size = 0.00

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x}{(a^2cx^2+c)\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(x/((a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.24, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^2 c x^2 + c\right) \arctan \left(ax\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)/arctan(a*x)^2,x)
[Out] int(x/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{sage_0 x \arctan \left(ax\right) - x}{ac \arctan \left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
[Out] (arctan(a*x)*integrate(1/arctan(a*x), x) - x)/(a*c*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^2*(c + a^2*c*x^2)),x)
[Out] int(x/(atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^2 x^2 \operatorname{atan}^2\left(ax\right) + \operatorname{atan}^2\left(ax\right)}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)/atan(a*x)**2,x)
[Out] Integral(x/(a**2*x**2*atan(a*x)**2 + atan(a*x)**2), x)/c
```

3.546 $\int \frac{1}{(c+a^2cx^2)\tan^{-1}(ax)^2} \, dx$

Optimal. Leaf size=14

$$-\frac{1}{ac\tan^{-1}(ax)}$$

```
[Out] -1/a/c/arctan(a*x)
```

Rubi [A] time = 0.02, antiderivative size = 14, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4884}

$$-\frac{1}{ac\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c*ArcTan[a*x]))
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^2} \, dx = -\frac{1}{ac\tan^{-1}(ax)}$$

Mathematica [A] time = 0.00, size = 14, normalized size = 1.00

$$-\frac{1}{ac\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c*ArcTan[a*x]))
```

fricas [A] time = 0.38, size = 14, normalized size = 1.00

$$-\frac{1}{ac\arctan(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] -1/(a*c*arctan(a*x))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 15, normalized size = 1.07

$$-\frac{1}{ac\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] -1/a/c/arctan(a*x)
```

maxima [A] time = 0.33, size = 14, normalized size = 1.00

$$-\frac{1}{ac\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -1/(a*c*arctan(a*x))
```

mupad [B] time = 0.34, size = 14, normalized size = 1.00

$$-\frac{1}{a\,c\,\mathrm{atan}\left(a\,x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^2*(c + a^2*c*x^2)),x)
```

```
[Out] -1/(a*c*atan(a*x))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{1}{ac\,\mathrm{atan}\left(ax\right)} & \text{for}\ c \neq 0 \\ \tilde{\infty}\int \frac{1}{\mathrm{atan}^{2}\left(ax\right)}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] Piecewise((-1/(a*c*atan(a*x)), Ne(c, 0)), (zoo*Integral(atan(a*x)**(-2), x)
, True))
```

3.547 $\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=39

$$-\frac{\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)},x\right)}{ac}-\frac{1}{acx\tan^{-1}(ax)}$$

```
[Out] -1/a/c/x/arctan(a*x)-Unintegrable(1/x^2/arctan(a*x),x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] -(1/(a*c*x*ArcTan[a*x])) - Defer[Int][1/(x^2*ArcTan[a*x]), x]/(a*c)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx=-\frac{1}{acx\tan^{-1}(ax)}-\frac{\int \frac{1}{x^2\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 0.53, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^3+cx\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^2*c*x^3 + c*x)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)\arctan\left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{sage_{0}x^{2}\arctan\left(ax\right)+1}{acx\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(x*arctan(a*x)*integrate(1/(x^2*arctan(a*x)), x) + 1)/(a*c*x*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{2}\,\left(c\,a^{2}\,x^{2}+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2}x^{3}\,\mathrm{atan}^{2}\left(ax\right)+x\,\mathrm{atan}^{2}\left(ax\right)}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**2*x**3*atan(a*x)**2 + x*atan(a*x)**2), x)/c
```

3.548 $\int \frac{1}{x^2(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=39

$$-\frac{2\text{Int}\left(\frac{1}{x^3\tan^{-1}(ax)},x\right)}{ac}-\frac{1}{acx^2\tan^{-1}(ax)}$$

```
[Out] -1/a/c/x^2/arctan(a*x)-2*Unintegrable(1/x^3/arctan(a*x),x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] -(1/(a*c*x^2*ArcTan[a*x])) - (2*Defer[Int][1/(x^3*ArcTan[a*x]), x])/(a*c)
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx=-\frac{1}{acx^2\tan^{-1}(ax)}-\frac{2\int \frac{1}{x^3\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 0.70, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^4+cx^2\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^2*c*x^4 + c*x^2)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(a^2 c\, x^2 + c\right) \arctan \left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\, sage_0 x^3 \arctan \left(a x\right) + 1}{a c x^2 \arctan \left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(2*x^2*arctan(a*x)*integrate(1/(x^3*arctan(a*x)), x) + 1)/(a*c*x^2*arctan(
a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2\, \mathrm{atan}\left(a\, x\right)^2\, \left(c\, a^2\, x^2 + c\right)} \,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^2 x^4 \operatorname{atan}^2 \left(a x\right) + x^2 \operatorname{atan}^2 \left(a x\right)}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**2*x**4*atan(a*x)**2 + x**2*atan(a*x)**2), x)/c
```

3.549 $\int \frac{1}{x^3(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=39

$$-\frac{3\text{Int}\left(\frac{1}{x^4\tan^{-1}(ax)},x\right)}{ac}-\frac{1}{acx^3\tan^{-1}(ax)}$$

```
[Out] -1/a/c/x^3/arctan(a*x)-3*Unintegrable(1/x^4/arctan(a*x),x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] -(1/(a*c*x^3*ArcTan[a*x])) - (3*Defer[Int][1/(x^4*ArcTan[a*x]), x])/(a*c)
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx=-\frac{1}{acx^3\tan^{-1}(ax)}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^5+cx^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^2*c*x^5 + c*x^3)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.30, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c\,x^{2}+c\right) \arctan \left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{3\,sage_{0}x^{4}\arctan \left(ax\right)+1}{acx^{3}\arctan \left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(3*x^3*arctan(a*x)*integrate(1/(x^4*arctan(a*x)), x) + 1)/(a*c*x^3*arctan(
a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^3\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2} x^{5} \operatorname{atan}^{2}{\left(a x \right)} + x^{3} \operatorname{atan}^{2}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**2*x**5*atan(a*x)**2 + x**3*atan(a*x)**2), x)/c
```

3.550 $\int \frac{1}{x^4(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=39

$$-\frac{4\text{Int}\left(\frac{1}{x^5\tan^{-1}(ax)},x\right)}{ac}-\frac{1}{acx^4\tan^{-1}(ax)}$$

```
[Out] -1/a/c/x^4/arctan(a*x)-4*Unintegrable(1/x^5/arctan(a*x),x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] -(1/(a*c*x^4*ArcTan[a*x])) - (4*Defer[Int][1/(x^5*ArcTan[a*x]), x])/(a*c)
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx=-\frac{1}{acx^4\tan^{-1}(ax)}-\frac{4\int \frac{1}{x^5\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 1.25, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^6+cx^4\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^2*c*x^6 + c*x^4)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.20, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{4 \, sage_{0} x^{5} \arctan \left(a x\right) + 1}{a c x^{4} \arctan \left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(4*x^4*arctan(a*x)*integrate(1/(x^5*arctan(a*x)), x) + 1)/(a*c*x^4*arctan(
a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^2\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2} x^{6} \operatorname{atan}^{2}{\left(a x \right)} + x^{4} \operatorname{atan}^{2}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**2*x**6*atan(a*x)**2 + x**4*atan(a*x)**2), x)/c
```

3.551 $\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2} \, dx$

Optimal. Leaf size=72

$$\frac{\text{Int}\left(\frac{1}{\tan^{-1}(ax)},x\right)}{a^3c^2}-\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{a^4c^2}-\frac{x}{a^3c^2\tan^{-1}(ax)}+\frac{x}{a^3c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

[Out] -x/a^3/c^2/arctan(a*x)+x/a^3/c^2/(a^2*x^2+1)/arctan(a*x)-Ci(2*arctan(a*x))/a^4/c^2+Unintegrable(1/arctan(a*x),x)/a^3/c^2

Rubi [A] time = 0.33, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2} \, dx$$

Verification is Not applicable to the result.

[In] Int[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]

[Out] -(x/(a^3*c^2*ArcTan[a*x])) + x/(a^3*c^2*(1 + a^2*x^2)*ArcTan[a*x]) - CosIntegral[2*ArcTan[a*x]]/(a^4*c^2) + Defer[Int][ArcTan[a*x]^(-1), x]/(a^3*c^2)

Rubi steps

$$\begin{aligned}
\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2} \, dx &= -\frac{\int \frac{x}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2} \, dx}{a^2}+\frac{\int \frac{x}{\left(c+a^2cx^2\right) \tan^{-1}(ax)^2} \, dx}{a^2c}\\
&= -\frac{x}{a^3c^2\tan^{-1}(ax)}+\frac{x}{a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\int \frac{1}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)} \, dx}{a^3}+\frac{\int \frac{1}{\left(c+a^2c\right.}}{}\\
&= -\frac{x}{a^3c^2\tan^{-1}(ax)}+\frac{x}{a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x} \, dx,x,\tan^{-1}(ax)\right)}{a^4c^2}\\
&= -\frac{x}{a^3c^2\tan^{-1}(ax)}+\frac{x}{a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right) \, dx,x,\tan\right.}{a^4c^2}\\
&= -\frac{x}{a^3c^2\tan^{-1}(ax)}+\frac{x}{a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-2\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x} \, dx,x,\tan^{-1}(ax\right.}{2a^4c^2}\\
&= -\frac{x}{a^3c^2\tan^{-1}(ax)}+\frac{x}{a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{a^4c^2}+\frac{\int \frac{1}{\tan^{-1}(ax)} \, dx}{a^3c^2}
\end{aligned}$$

Mathematica [A] time = 7.09, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^3}{\left(a^4c^2x^4 + 2\,a^2c^2x^2 + c^2\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(x^3/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.91, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2c\,x^2 + c\right)^2 \arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
[Out] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{-\left(a^3c^2x^2 + ac^2\right)sage_0x\arctan\left(ax\right) + x^3}{\left(a^3c^2x^2 + ac^2\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
[Out] -(x^3 - (a^3*c^2*x^2 + a*c^2)*arctan(a*x)*integrate((a^2*x^4 + 3*x^2)/((a^5
*c^2*x^4 + 2*a^3*c^2*x^2 + a*c^2)*arctan(a*x)), x))/((a^3*c^2*x^2 + a*c^2)*
arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2 + c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^2),x)
[Out] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^4x^4\,\mathrm{atan}^2\left(ax\right) + 2a^2x^2\,\mathrm{atan}^2\left(ax\right) + \mathrm{atan}^2\left(ax\right)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(x**3/(a**4*x**4*atan(a*x)**2 + 2*a**2*x**2*atan(a*x)**2 + atan(a*x
)**2), x)/c**2
```

3.552 $\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=43

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{a^3c^2}-\frac{x^2}{ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

```
[Out] -x^2/a/c^2/(a^2*x^2+1)/arctan(a*x)+Si(2*arctan(a*x))/a^3/c^2
```

Rubi [A] time = 0.14, antiderivative size = 43, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4942, 4970, 4406, 12, 3299}

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{a^3c^2}-\frac{x^2}{ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(x^2/(a*c^2*(1 + a^2*x^2)*ArcTan[a*x])) + SinIntegral[2*ArcTan[a*x]]/(a^3*
c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx = -\frac{x^2}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} + \frac{2\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx}{a}$$

$$= -\frac{x^2}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} + \frac{2\,\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^3c^2}$$

$$= -\frac{x^2}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} + \frac{2\,\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \tan^{-1}(ax)\right)}{a^3c^2}$$

$$= -\frac{x^2}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} + \frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^3c^2}$$

$$= -\frac{x^2}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} + \frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{a^3c^2}$$

Mathematica [A] time = 0.12, size = 40, normalized size = 0.93

$$\frac{\text{Si}\left(2\tan^{-1}(ax)\right) - \frac{a^2x^2}{\left(a^2x^2+1\right)\tan^{-1}(ax)}}{a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] (-((a^2*x^2)/((1 + a^2*x^2)*ArcTan[a*x])) + SinIntegral[2*ArcTan[a*x]])/(a^
3*c^2)
```

fricas [C] time = 0.46, size = 123, normalized size = 2.86

$$-\frac{2\,a^2x^2 - \left(i\,a^2x^2 + i\right)\arctan(ax)\,\text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right) - \left(-i\,a^2x^2 - i\right)\arctan(ax)\,\text{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right)}{2\left(a^5c^2x^2 + a^3c^2\right)\arctan(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] -1/2*(2*a^2*x^2 - (I*a^2*x^2 + I)*arctan(a*x)*log_integral(-(a^2*x^2 + 2*I*
a*x - 1)/(a^2*x^2 + 1)) - (-I*a^2*x^2 - I)*arctan(a*x)*log_integral(-(a^2*x
^2 - 2*I*a*x - 1)/(a^2*x^2 + 1)))/((a^5*c^2*x^2 + a^3*c^2)*arctan(a*x))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.30, size = 37, normalized size = 0.86

$$\frac{2\,\text{Si}\left(2\arctan(ax)\right)\arctan(ax) + \cos\left(2\arctan(ax)\right) - 1}{2a^3c^2\arctan(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

```
[Out] 1/2/a^3/c^2*(2*Si(2*arctan(a*x))*arctan(a*x)+cos(2*arctan(a*x))-1)/arctan(a
*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^3c^2x^2+ac^2\right)\arctan\left(ax\right)\int\frac{x}{\left(a^5c^2x^4+2\,a^3c^2x^2+ac^2\right)\arctan(ax)}\,dx-x^2}{\left(a^3c^2x^2+ac^2\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] (4*(a^3*c^2*x^2 + a*c^2)*arctan(a*x)*integrate(1/2*x/((a^5*c^2*x^4 + 2*a^3*
c^2*x^2 + a*c^2)*arctan(a*x)), x) - x^2)/((a^3*c^2*x^2 + a*c^2)*arctan(a*x)
)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{x^2}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{x^2}{a^4x^4\,\mathrm{atan}^2\left(ax\right)+2a^2x^2\,\mathrm{atan}^2\left(ax\right)+\mathrm{atan}^2\left(ax\right)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(x**2/(a**4*x**4*atan(a*x)**2 + 2*a**2*x**2*atan(a*x)**2 + atan(a*x
)**2), x)/c**2
```

3.553 $\int \frac{x}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2} dx$

Optimal. Leaf size=41

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{a^2c^2} - \frac{x}{ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

```
[Out] -x/a/c^2/(a^2*x^2+1)/arctan(a*x)+Ci(2*arctan(a*x))/a^2/c^2
```

Rubi [A] time = 0.21, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4968, 4970, 3312, 3302, 4904}

$$\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{a^2c^2} - \frac{x}{ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(x/(a*c^2*(1 + a^2*x^2)*ArcTan[a*x])) + CosIntegral[2*ArcTan[a*x]]/(a^2*c^
2)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
```

```
|| GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx = -\frac{x}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx}{a}-a\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(\ldots}$$

$$= -\frac{x}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{a^2c^2}-\frac{\text{Subst}\left(\int \frac{\sin\ldots}{}\right.}{}$$

$$= -\frac{x}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Subst}\left(\int\left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right)dx,x,\tan^{-1}(ax)\right)}{a^2c^2}+\frac{\text{Subs}\ldots}{}$$

$$= -\frac{x}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+2\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{2a^2c^2}$$

$$= -\frac{x}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{a^2c^2}$$

Mathematica [A] time = 0.08, size = 36, normalized size = 0.88

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)-\frac{ax}{\left(a^2x^2+1\right)\tan^{-1}(ax)}}{a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
[Out] (-((a*x)/((1 + a^2*x^2)*ArcTan[a*x])) + CosIntegral[2*ArcTan[a*x]])/(a^2*c^
2)
```

fricas [C] time = 0.45, size = 115, normalized size = 2.80

$$\frac{\left(a^2x^2+1\right)\arctan(ax)\,\text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right)+\left(a^2x^2+1\right)\arctan(ax)\,\text{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right)-2\,a\ldots}{2\left(a^4c^2x^2+a^2c^2\right)\arctan(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
[Out] 1/2*((a^2*x^2 + 1)*arctan(a*x)*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x
^2 + 1)) + (a^2*x^2 + 1)*arctan(a*x)*log_integral(-(a^2*x^2 - 2*I*a*x - 1)/
(a^2*x^2 + 1)) - 2*a*x)/((a^4*c^2*x^2 + a^2*c^2)*arctan(a*x))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.25, size = 38, normalized size = 0.93

$$\frac{2\,\mathrm{Ci}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)-\sin\left(2\arctan\left(ax\right)\right)}{2a^{2}c^{2}\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

```
[Out] 1/2/a^2/c^2*(2*Ci(2*arctan(a*x))*arctan(a*x)-sin(2*arctan(a*x)))/arctan(a*x
)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(a^{3}c^{2}x^{2}+ac^{2}\right)sage_{0}x\arctan\left(ax\right)+x}{\left(a^{3}c^{2}x^{2}+ac^{2}\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -((a^3*c^2*x^2 + a*c^2)*arctan(a*x)*integrate((a^2*x^2 - 1)/((a^5*c^2*x^4 +
 2*a^3*c^2*x^2 + a*c^2)*arctan(a*x)), x) + x)/((a^3*c^2*x^2 + a*c^2)*arctan
(a*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{2}\,\left(c\,a^{2}\,x^{2}+c\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{4}x^{4}\,\mathrm{atan}^{2}\left(ax\right)+2a^{2}x^{2}\,\mathrm{atan}^{2}\left(ax\right)+\mathrm{atan}^{2}\left(ax\right)}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(x/(a**4*x**4*atan(a*x)**2 + 2*a**2*x**2*atan(a*x)**2 + atan(a*x)**
2), x)/c**2
```

3.554 $\int \frac{1}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2} \, dx$

Optimal. Leaf size=41

$$-\frac{1}{ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{ac^2}$$

```
[Out] -1/a/c^2/(a^2*x^2+1)/arctan(a*x)-Si(2*arctan(a*x))/a/c^2
```

Rubi [A] time = 0.09, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4902, 4970, 4406, 12, 3299}

$$-\frac{1}{ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*(1 + a^2*x^2)*ArcTan[a*x])) - SinIntegral[2*ArcTan[a*x]]/(a*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx = -\frac{1}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - (2a)\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx$$
$$= -\frac{1}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - \frac{2\,\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{ac^2}$$
$$= -\frac{1}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - \frac{2\,\text{Subst}\left(\int \frac{\sin(2x)}{2x}\,dx, x, \tan^{-1}(ax)\right)}{ac^2}$$
$$= -\frac{1}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - \frac{\text{Subst}\left(\int \frac{\sin(2x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{ac^2}$$
$$= -\frac{1}{ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - \frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{ac^2}$$

Mathematica [A] time = 0.07, size = 34, normalized size = 0.83

$$-\frac{\frac{1}{a^2x^2\tan^{-1}(ax)+\tan^{-1}(ax)} + \text{Si}\left(2\tan^{-1}(ax)\right)}{ac^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(((ArcTan[a*x] + a^2*x^2*ArcTan[a*x])^(-1) + SinIntegral[2*ArcTan[a*x]])/(
a*c^2))
```

fricas [C] time = 0.51, size = 112, normalized size = 2.73

$$\frac{\left(-i\,a^2x^2 - i\right)\arctan(ax)\,\text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right) + \left(i\,a^2x^2 + i\right)\arctan(ax)\,\text{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right) - 2}{2\left(a^3c^2x^2 + ac^2\right)\arctan(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/2*((-I*a^2*x^2 - I)*arctan(a*x)*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^
2*x^2 + 1)) + (I*a^2*x^2 + I)*arctan(a*x)*log_integral(-(a^2*x^2 - 2*I*a*x
- 1)/(a^2*x^2 + 1)) - 2)/((a^3*c^2*x^2 + a*c^2)*arctan(a*x))
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.23, size = 37, normalized size = 0.90

$$-\frac{2\,\text{Si}\left(2\arctan(ax)\right)\arctan(ax) + \cos\left(2\arctan(ax)\right) + 1}{2a\,c^2\arctan(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

```
[Out] -1/2/a/c^2*(2*Si(2*arctan(a*x))*arctan(a*x)+cos(2*arctan(a*x))+1)/arctan(a*
x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\left(a^4c^2x^2+a^2c^2\right)\arctan\left(ax\right)\int\frac{x}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)}\,dx+1}{\left(a^3c^2x^2+ac^2\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(4*(a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)*integrate(1/2*x/((a^4*c^2*x^4 + 2*a
^2*c^2*x^2 + c^2)*arctan(a*x)), x) + 1)/((a^3*c^2*x^2 + a*c^2)*arctan(a*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int\frac{1}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{1}{a^4x^4\operatorname{atan}^2{(ax)}+2a^2x^2\operatorname{atan}^2{(ax)}+\operatorname{atan}^2{(ax)}}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**4*x**4*atan(a*x)**2 + 2*a**2*x**2*atan(a*x)**2 + atan(a*x)**
2), x)/c**2
```

3.555 $\int \frac{1}{x(c+a^2cx^2)^2 \tan^{-1}(ax)^2} dx$

Optimal. Leaf size=74

$$-\frac{\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)},x\right)}{ac^2}+\frac{ax}{c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{1}{ac^2x\tan^{-1}(ax)}$$

```
[Out] -1/a/c^2/x/arctan(a*x)+a*x/c^2/(a^2*x^2+1)/arctan(a*x)-Ci(2*arctan(a*x))/c^
2-Unintegrable(1/x^2/arctan(a*x),x)/a/c^2
```

Rubi [A] time = 0.36, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*x*ArcTan[a*x])) + (a*x)/(c^2*(1 + a^2*x^2)*ArcTan[a*x]) - CosInt
egral[2*ArcTan[a*x]]/c^2 - Defer[Int][1/(x^2*ArcTan[a*x]), x]/(a*c^2)
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx &= -\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx}{c}\\
&= -\frac{1}{ac^2x\tan^{-1}(ax)}+\frac{ax}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-a\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)}\,dx+\\
&= -\frac{1}{ac^2x\tan^{-1}(ax)}+\frac{ax}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x}\,dx,x,\tan^{-1}(ax)\right)}{c^2}\\
&= -\frac{1}{ac^2x\tan^{-1}(ax)}+\frac{ax}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(2x)}{2x}\right)dx,x,\tan\right.}{c^2}\\
&= -\frac{1}{ac^2x\tan^{-1}(ax)}+\frac{ax}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-2\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx,x,\tan^{-1}(ax\right.}{2c^2}\\
&= -\frac{1}{ac^2x\tan^{-1}(ax)}+\frac{ax}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{\int \frac{1}{x^2\tan^{-1}(ax)}\,d}{ac^2}
\end{aligned}$$

Mathematica [A] time = 1.67, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.89, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^2c\,x^2+c\right)^2\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
[Out] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(a^3c^2x^3+ac^2x\right)sage_0x\arctan\left(ax\right)+1}{\left(a^3c^2x^3+ac^2x\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
[Out] -((a^3*c^2*x^3 + a*c^2*x)*arctan(a*x)*integrate((3*a^2*x^2 + 1)/((a^5*c^2*x
^6 + 2*a^3*c^2*x^4 + a*c^2*x^2)*arctan(a*x)), x) + 1)/((a^3*c^2*x^3 + a*c^2
*x)*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^2),x)
[Out] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^5\,\mathrm{atan}^2\left(ax\right)+2a^2x^3\,\mathrm{atan}^2\left(ax\right)+x\,\mathrm{atan}^2\left(ax\right)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**4*x**5*atan(a*x)**2 + 2*a**2*x**3*atan(a*x)**2 + x*atan(a*x)
**2), x)/c**2
```

3.556 $\int \frac{1}{x^2(c+a^2cx^2)^2\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=73

$$-\frac{2\text{Int}\left(\frac{1}{x^3\tan^{-1}(ax)},x\right)}{ac^2}+\frac{a}{c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{a\text{Si}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{1}{ac^2x^2\tan^{-1}(ax)}$$

```
[Out] -1/a/c^2/x^2/arctan(a*x)+a/c^2/(a^2*x^2+1)/arctan(a*x)+a*Si(2*arctan(a*x))/
c^2-2*Unintegrable(1/x^3/arctan(a*x),x)/a/c^2
```

Rubi [A] time = 0.24, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*x^2*ArcTan[a*x])) + a/(c^2*(1 + a^2*x^2)*ArcTan[a*x]) + (a*SinIn
tegral[2*ArcTan[a*x]])/c^2 - (2*Defer[Int][1/(x^3*ArcTan[a*x]), x])/(a*c^2)
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx=-\left(a^2\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx}{c}$$

$$=-\frac{1}{ac^2x^2\tan^{-1}(ax)}+\frac{a}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\left(2a^3\right)\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(}$$

$$=-\frac{1}{ac^2x^2\tan^{-1}(ax)}+\frac{a}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\int \frac{1}{x^3\tan^{-1}(ax)}\,dx}{ac^2}+\frac{(2a)\,\text{Sul}}{}$$

$$=-\frac{1}{ac^2x^2\tan^{-1}(ax)}+\frac{a}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\int \frac{1}{x^3\tan^{-1}(ax)}\,dx}{ac^2}+\frac{(2a)\,\text{Sul}}{}$$

$$=-\frac{1}{ac^2x^2\tan^{-1}(ax)}+\frac{a}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\int \frac{1}{x^3\tan^{-1}(ax)}\,dx}{ac^2}+\frac{a\,\text{Subst}}{}$$

$$=-\frac{1}{ac^2x^2\tan^{-1}(ax)}+\frac{a}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{a\text{Si}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{2\int \frac{1}{x^3\,\text{ta}}}{a}$$

Mathematica [A] time = 2.79, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^2), x]

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4c^2x^6 + 2\,a^2c^2x^4 + c^2x^2\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")

[Out] integral(1/((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arctan(a*x)^2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a^2c\,x^2+c\right)^2\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)

[Out] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\left(a^3c^2x^4 + ac^2x^2\right)\arctan\left(ax\right)\int \frac{2\,a^2x^2+1}{\left(a^5c^2x^7+2\,a^3c^2x^5+ac^2x^3\right)\arctan(ax)}\,dx + 1}{\left(a^3c^2x^4 + ac^2x^2\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")

[Out] -((a^3*c^2*x^4 + a*c^2*x^2)*arctan(a*x)*integrate(2*(2*a^2*x^2 + 1)/((a^5*c^2*x^7 + 2*a^3*c^2*x^5 + a*c^2*x^3)*arctan(a*x)), x) + 1)/((a^3*c^2*x^4 + a*c^2*x^2)*arctan(a*x))

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^2),x)

[Out] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^2), x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^6\,\mathrm{atan}^2\left(ax\right)+2a^2x^4\,\mathrm{atan}^2\left(ax\right)+x^2\,\mathrm{atan}^2\left(ax\right)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**4*x**6*atan(a*x)**2 + 2*a**2*x**4*atan(a*x)**2 + x**2*atan(a
*x)**2), x)/c**2
```

3.557 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=111

$$-\frac{3\text{Int}\left(\frac{1}{x^4\tan^{-1}(ax)},x\right)}{ac^2}+\frac{a\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)},x\right)}{c^2}+\frac{a^2\text{Ci}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{a^3x}{c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{1}{ac^2x^3\tan^{-1}(ax)}+\frac{}{c^2x\,\text{ta}}$$

```
[Out] -1/a/c^2/x^3/arctan(a*x)+a/c^2/x/arctan(a*x)-a^3*x/c^2/(a^2*x^2+1)/arctan(a
*x)+a^2*Ci(2*arctan(a*x))/c^2-3*Unintegrable(1/x^4/arctan(a*x),x)/a/c^2+a*U
nintegrable(1/x^2/arctan(a*x),x)/c^2
```

Rubi [A] time = 0.50, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*x^3*ArcTan[a*x])) + a/(c^2*x*ArcTan[a*x]) - (a^3*x)/(c^2*(1 + a^
2*x^2)*ArcTan[a*x]) + (a^2*CosIntegral[2*ArcTan[a*x]])/c^2 - (3*Defer[Int][
1/(x^4*ArcTan[a*x]), x])/(a*c^2) + (a*Defer[Int][1/(x^2*ArcTan[a*x]), x])/c
^2
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx &= -\left(a^2\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx}{c}\\
&= -\frac{1}{ac^2x^3\tan^{-1}(ax)}+a^4\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}\,dx}{ac^2}-\frac{a^2}{}\\
&= -\frac{1}{ac^2x^3\tan^{-1}(ax)}+\frac{a}{c^2x\tan^{-1}(ax)}-\frac{a^3x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+a^3\int \frac{}{\left(c+a^2c\right.}\\
&= -\frac{1}{ac^2x^3\tan^{-1}(ax)}+\frac{a}{c^2x\tan^{-1}(ax)}-\frac{a^3x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}}{ac^2}\\
&= -\frac{1}{ac^2x^3\tan^{-1}(ax)}+\frac{a}{c^2x\tan^{-1}(ax)}-\frac{a^3x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}}{ac^2}\\
&= -\frac{1}{ac^2x^3\tan^{-1}(ax)}+\frac{a}{c^2x\tan^{-1}(ax)}-\frac{a^3x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}}{ac^2}\\
&= -\frac{1}{ac^2x^3\tan^{-1}(ax)}+\frac{a}{c^2x\tan^{-1}(ax)}-\frac{a^3x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{a^2\text{Ci}\left(2\tan^{-1}(\right.}{c^2}
\end{aligned}$$

Mathematica [A] time = 3.43, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4c^2x^7 + 2\,a^2c^2x^5 + c^2x^3\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.58, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(a^2c\,x^2+c\right)^2\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
[Out] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(a^3c^2x^5 + ac^2x^3\right)sage_0x\arctan\left(ax\right) + 1}{\left(a^3c^2x^5 + ac^2x^3\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
[Out] -((a^3*c^2*x^5 + a*c^2*x^3)*arctan(a*x)*integrate((5*a^2*x^2 + 3)/((a^5*c^2
*x^8 + 2*a^3*c^2*x^6 + a*c^2*x^4)*arctan(a*x)), x) + 1)/((a^3*c^2*x^5 + a*c
^2*x^3)*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^2),x)
[Out] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^7\,\mathrm{atan}^2\,(ax)+2a^2x^5\,\mathrm{atan}^2\,(ax)+x^3\,\mathrm{atan}^2\,(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**4*x**7*atan(a*x)**2 + 2*a**2*x**5*atan(a*x)**2 + x**3*atan(a
*x)**2), x)/c**2
```

3.558 $\int \frac{1}{x^4(c+a^2cx^2)^2 \tan^{-1}(ax)^2} dx$

Optimal. Leaf size=112

$$-\frac{4\text{Int}\left(\frac{1}{x^5\tan^{-1}(ax)},x\right)}{ac^2}+\frac{2a\text{Int}\left(\frac{1}{x^3\tan^{-1}(ax)},x\right)}{c^2}-\frac{a^3\text{Si}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{a^3}{c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{1}{ac^2x^4\tan^{-1}(ax)}+\frac{}{c^2}$$

```
[Out] -1/a/c^2/x^4/arctan(a*x)+a/c^2/x^2/arctan(a*x)-a^3/c^2/(a^2*x^2+1)/arctan(a
*x)-a^3*Si(2*arctan(a*x))/c^2-4*Unintegrable(1/x^5/arctan(a*x),x)/a/c^2+2*a
*Unintegrable(1/x^3/arctan(a*x),x)/c^2
```

Rubi [A] time = 0.40, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^2*x^4*ArcTan[a*x])) + a/(c^2*x^2*ArcTan[a*x]) - a^3/(c^2*(1 + a^2*
x^2)*ArcTan[a*x]) - (a^3*SinIntegral[2*ArcTan[a*x]])/c^2 - (4*Defer[Int][1/
(x^5*ArcTan[a*x]), x])/(a*c^2) + (2*a*Defer[Int][1/(x^3*ArcTan[a*x]), x])/c
^2
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx &= -\left(a^2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx}{c}\\
&= -\frac{1}{ac^2x^4\tan^{-1}(ax)}+a^4\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx-\frac{4\int \frac{1}{x^5\tan^{-1}(ax)}\,dx}{ac^2}-\\
&= -\frac{1}{ac^2x^4\tan^{-1}(ax)}+\frac{a}{c^2x^2\tan^{-1}(ax)}-\frac{a^3}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\left(2a^5\right)\int -\\
&= -\frac{1}{ac^2x^4\tan^{-1}(ax)}+\frac{a}{c^2x^2\tan^{-1}(ax)}-\frac{a^3}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{4\int \frac{1}{x^5\tan^{-1}}}{ac^2}\\
&= -\frac{1}{ac^2x^4\tan^{-1}(ax)}+\frac{a}{c^2x^2\tan^{-1}(ax)}-\frac{a^3}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{4\int \frac{1}{x^5\tan^{-1}}}{ac^2}\\
&= -\frac{1}{ac^2x^4\tan^{-1}(ax)}+\frac{a}{c^2x^2\tan^{-1}(ax)}-\frac{a^3}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{4\int \frac{1}{x^5\tan^{-1}}}{ac^2}\\
&= -\frac{1}{ac^2x^4\tan^{-1}(ax)}+\frac{a}{c^2x^2\tan^{-1}(ax)}-\frac{a^3}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{a^3\text{Si}\left(2\tan\right.}{c^2}
\end{aligned}$$

Mathematica [A] time = 3.31, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4c^2x^8 + 2\,a^2c^2x^6 + c^2x^4\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(1/((a^4*c^2*x^8 + 2*a^2*c^2*x^6 + c^2*x^4)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.49, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(a^2c\,x^2 + c\right)^2 \arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\left(a^3c^2x^6 + ac^2x^4\right)\arctan\left(ax\right)\int\frac{3\,a^2x^2+2}{\left(a^5c^2x^9+2\,a^3c^2x^7+ac^2x^5\right)\arctan(ax)}\,dx + 1}{\left(a^3c^2x^6 + ac^2x^4\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -((a^3*c^2*x^6 + a*c^2*x^4)*arctan(a*x)*integrate(2*(3*a^2*x^2 + 2)/((a^5*c
^2*x^9 + 2*a^3*c^2*x^7 + a*c^2*x^5)*arctan(a*x)), x) + 1)/((a^3*c^2*x^6 + a
*c^2*x^4)*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^8\operatorname{atan}^2(ax)+2a^2x^6\operatorname{atan}^2(ax)+x^4\operatorname{atan}^2(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**4*x**8*atan(a*x)**2 + 2*a**2*x**6*atan(a*x)**2 + x**4*atan(a
*x)**2), x)/c**2
```

3.559 $\int \frac{x^3}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} dx$

Optimal. Leaf size=86

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^4c^3}-\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{2a^4c^3}-\frac{x}{a^3c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{x}{a^3c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

```
[Out] x/a^3/c^3/(a^2*x^2+1)^2/arctan(a*x)-x/a^3/c^3/(a^2*x^2+1)/arctan(a*x)+1/2*C
i(2*arctan(a*x))/a^4/c^3-1/2*Ci(4*arctan(a*x))/a^4/c^3
```

Rubi [A] time = 0.52, antiderivative size = 86, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4964, 4968, 4970, 3312, 3302, 4904, 4406}

$$\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{2a^4c^3}-\frac{\text{CosIntegral}\left(4\tan^{-1}(ax)\right)}{2a^4c^3}-\frac{x}{a^3c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{x}{a^3c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] x/(a^3*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) - x/(a^3*c^3*(1 + a^2*x^2)*ArcTan[a
*x]) + CosIntegral[2*ArcTan[a*x]]/(2*a^4*c^3) - CosIntegral[4*ArcTan[a*x]]/
(2*a^4*c^3)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
```

```
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx = -\frac{\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx}{a^2}+\frac{\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx}{a^2c}$$

$$= \frac{x}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{x}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}}{a^3}$$

$$= \frac{x}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{x}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x}\,dx,\right.}{a^4c^3}$$

$$= \frac{x}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{x}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Subst}\left(\int \left(\frac{1}{2x}-\frac{\cos(}{2x}\right.\right.}{a}$$

$$= \frac{x}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{x}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Subst}\left(\int \frac{\cos(4x)}{x}\,dx,\right.}{8a^4c^3}$$

$$= \frac{x}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{x}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^4c^3}-$$

Mathematica [A] time = 0.15, size = 83, normalized size = 0.97

$$\frac{-2a^3x^3+\left(a^2x^2+1\right)^2\tan^{-1}(ax)\text{Ci}\left(2\tan^{-1}(ax)\right)-\left(a^2x^2+1\right)^2\tan^{-1}(ax)\text{Ci}\left(4\tan^{-1}(ax)\right)}{2a^4c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] (-2*a^3*x^3 + (1 + a^2*x^2)^2*ArcTan[a*x]*CosIntegral[2*ArcTan[a*x]] - (1 +
 a^2*x^2)^2*ArcTan[a*x]*CosIntegral[4*ArcTan[a*x]])/(2*a^4*c^3*(1 + a^2*x^2
)^2*ArcTan[a*x])
```

fricas [C] time = 0.47, size = 292, normalized size = 3.40

$$-\frac{4\,a^3x^3 + \left(a^4x^4 + 2\,a^2x^2 + 1\right)\arctan\left(ax\right)\mathrm{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right) + \left(a^4x^4 + 2\,a^2x^2 + 1\right)\arctan\left(ax\right)}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(4*a^3*x^3 + (a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)*log_integral((a^4*x
^4 + 4*I*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (a
^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)*log_integral((a^4*x^4 - 4*I*a^3*x^3 - 6
*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) - (a^4*x^4 + 2*a^2*x^2 +
 1)*arctan(a*x)*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 + 1)) - (a^4
*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)*log_integral(-(a^2*x^2 - 2*I*a*x - 1)/(a^
2*x^2 + 1)))/((a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)*arctan(a*x))
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.24, size = 58, normalized size = 0.67

$$\frac{4\,\mathrm{Ci}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right) - 4\,\mathrm{Ci}\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right) - 2\sin\left(2\arctan\left(ax\right)\right) + \sin\left(4\arctan\left(ax\right)\right)}{8a^4c^3\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] 1/8/a^4/c^3*(4*Ci(2*arctan(a*x))*arctan(a*x)-4*Ci(4*arctan(a*x))*arctan(a*x
)-2*sin(2*arctan(a*x))+sin(4*arctan(a*x)))/arctan(a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(a^5c^3x^4 + 2\,a^3c^3x^2 + ac^3\right)sage_0x\arctan\left(ax\right) + x^3}{\left(a^5c^3x^4 + 2\,a^3c^3x^2 + ac^3\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(x^3 + (a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x)*integrate((a^2*x^
4 - 3*x^2)/((a^7*c^3*x^6 + 3*a^5*c^3*x^4 + 3*a^3*c^3*x^2 + a*c^3)*arctan(a*
x)), x))/((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^6x^6\,\mathrm{atan}^2\,(ax)+3a^4x^4\,\mathrm{atan}^2\,(ax)+3a^2x^2\,\mathrm{atan}^2\,(ax)+\mathrm{atan}^2\,(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(x**3/(a**6*x**6*atan(a*x)**2 + 3*a**4*x**4*atan(a*x)**2 + 3*a**2*x
**2*atan(a*x)**2 + atan(a*x)**2), x)/c**3
```

3.560 $\int \frac{x^2}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} \, dx$

Optimal. Leaf size=67

$$\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{2a^3c^3}-\frac{1}{a^3c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{1}{a^3c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

```
[Out] 1/a^3/c^3/(a^2*x^2+1)^2/arctan(a*x)-1/a^3/c^3/(a^2*x^2+1)/arctan(a*x)+1/2*S
i(4*arctan(a*x))/a^3/c^3
```

Rubi [A] time = 0.28, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4964, 4902, 4970, 4406, 12, 3299}

$$\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{2a^3c^3}-\frac{1}{a^3c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{1}{a^3c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] 1/(a^3*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) - 1/(a^3*c^3*(1 + a^2*x^2)*ArcTan[a
*x]) + SinIntegral[4*ArcTan[a*x]]/(2*a^3*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx = -\frac{\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx}{a^2}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx}{a^2c}$$

$$= \frac{1}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{1}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{4\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax}}{a}$$

$$= \frac{1}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{1}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin(}{x}\right.}{a^3}$$

$$= \frac{1}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{1}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{2x}\,d\right.}{a^3c^3}$$

$$= \frac{1}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{1}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\mathrm{Subst}\left(\int \frac{\sin(4x)}{x}\,dx,\right.}{2a^3c^3}$$

$$= \frac{1}{a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{1}{a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\mathrm{Si}\left(4\tan^{-1}(ax)\right)}{2a^3c^3}$$

Mathematica [A] time = 0.20, size = 59, normalized size = 0.88

$$\frac{\left(a^2x^2+1\right)^2\tan^{-1}(ax)\mathrm{Si}\left(4\tan^{-1}(ax)\right)-2a^2x^2}{2a^3c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] (-2*a^2*x^2 + (1 + a^2*x^2)^2*ArcTan[a*x]*SinIntegral[4*ArcTan[a*x]])/(2*a^
3*c^3*(1 + a^2*x^2)^2*ArcTan[a*x])
```

fricas [C] time = 0.51, size = 196, normalized size = 2.93

$$-\frac{4\,a^2x^2-\left(i\,a^4x^4+2i\,a^2x^2+i\right)\arctan(ax)\,\mathrm{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)-\left(-i\,a^4x^4-2i\,a^2x^2-i\right)\mathrm{arc}}{4\left(a^7c^3x^4+2\,a^5c^3x^2+a^3c^3\right)\arctan(ax)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] -1/4*(4*a^2*x^2 - (I*a^4*x^4 + 2*I*a^2*x^2 + I)*arctan(a*x)*log_integral((a
^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1))
- (-I*a^4*x^4 - 2*I*a^2*x^2 - I)*arctan(a*x)*log_integral((a^4*x^4 - 4*I*a^
```

```
3*x^3 - 6*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)))/((a^7*c^3*x^4
+ 2*a^5*c^3*x^2 + a^3*c^3)*arctan(a*x))
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.21, size = 37, normalized size = 0.55

$$\frac{4\,\mathrm{Si}\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)+\cos\left(4\arctan\left(ax\right)\right)-1}{8a^{3}c^{3}\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] 1/8/a^3/c^3*(4*Si(4*arctan(a*x))*arctan(a*x)+cos(4*arctan(a*x))-1)/arctan(a
*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\left(a^{5}c^{3}x^{4}+2\,a^{3}c^{3}x^{2}+ac^{3}\right)\arctan\left(ax\right)\int\frac{a^{2}x^{3}-x}{\left(a^{7}c^{3}x^{6}+3\,a^{5}c^{3}x^{4}+3\,a^{3}c^{3}x^{2}+ac^{3}\right)\arctan\left(ax\right)}\,dx+x^{2}}{\left(a^{5}c^{3}x^{4}+2\,a^{3}c^{3}x^{2}+ac^{3}\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x)*integrate(2*(a^2*x^3 -
x)/((a^7*c^3*x^6 + 3*a^5*c^3*x^4 + 3*a^3*c^3*x^2 + a*c^3)*arctan(a*x)), x)
+ x^2)/((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^{2}}{\mathrm{atan}\left(a\,x\right)^{2}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{x^{2}}{a^{6}x^{6}\operatorname{atan}^{2}{\left(ax\right)}+3a^{4}x^{4}\operatorname{atan}^{2}{\left(ax\right)}+3a^{2}x^{2}\operatorname{atan}^{2}{\left(ax\right)}+\operatorname{atan}^{2}{\left(ax\right)}}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(x**2/(a**6*x**6*atan(a*x)**2 + 3*a**4*x**4*atan(a*x)**2 + 3*a**2*x
**2*atan(a*x)**2 + atan(a*x)**2), x)/c**3
```

3.561 $\int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} dx$

Optimal. Leaf size=61

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^2c^3}+\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{2a^2c^3}-\frac{x}{ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

```
[Out] -x/a/c^3/(a^2*x^2+1)^2/arctan(a*x)+1/2*Ci(2*arctan(a*x))/a^2/c^3+1/2*Ci(4*a
rctan(a*x))/a^2/c^3
```

Rubi [A] time = 0.25, antiderivative size = 61, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = {4968, 4970, 4406, 3302, 4904, 3312}

$$\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{2a^2c^3}+\frac{\text{CosIntegral}\left(4\tan^{-1}(ax)\right)}{2a^2c^3}-\frac{x}{ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] -(x/(a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x])) + CosIntegral[2*ArcTan[a*x]]/(2*a^
2*c^3) + CosIntegral[4*ArcTan[a*x]]/(2*a^2*c^3)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
```

```
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx = -\frac{x}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx}{a} - (3a)\int \frac{x^2}{\left(c+a^2cx^2\right)^3\tan^{-1}}$$

$$= -\frac{x}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} + \frac{\text{Subst}\left(\int \frac{\cos^4(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^3} - \frac{3\,\text{Subst}\left(\int \frac{\cos}{}\right.}{}$$

$$= -\frac{x}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} + \frac{\text{Subst}\left(\int \left(\frac{3}{8x}+\frac{\cos(2x)}{2x}+\frac{\cos(4x)}{8x}\right)dx, x, \tan^{-1}(ax)\right)}{a^2c^3}$$

$$= -\frac{x}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} + \frac{\text{Subst}\left(\int \frac{\cos(4x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{8a^2c^3} + \frac{3\,\text{Subst}\left(\int \frac{\cos}{}\right.}{}$$

$$= -\frac{x}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} + \frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{2a^2c^3} + \frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{2a^2c^3}$$

Mathematica [A] time = 0.08, size = 75, normalized size = 1.23

$$\frac{\left(a^2x^2+1\right)^2\tan^{-1}(ax)\text{Ci}\left(2\tan^{-1}(ax)\right)+\left(a^2x^2+1\right)^2\tan^{-1}(ax)\text{Ci}\left(4\tan^{-1}(ax)\right)-2ax}{2c^3\left(a^3x^2+a\right)^2\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] (-2*a*x + (1 + a^2*x^2)^2*ArcTan[a*x]*CosIntegral[2*ArcTan[a*x]] + (1 + a^2
*x^2)^2*ArcTan[a*x]*CosIntegral[4*ArcTan[a*x]])/(2*c^3*(a + a^3*x^2)^2*ArcT
an[a*x])
```

fricas [C] time = 0.46, size = 286, normalized size = 4.69

$$\frac{\left(a^4x^4+2\,a^2x^2+1\right)\arctan(ax)\,\text{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+\left(a^4x^4+2\,a^2x^2+1\right)\arctan(ax)\,\text{log\_inte}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/4*((a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)*log_integral((a^4*x^4 + 4*I*a^3*
x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (a^4*x^4 + 2*a^
2*x^2 + 1)*arctan(a*x)*log_integral((a^4*x^4 - 4*I*a^3*x^3 - 6*a^2*x^2 + 4*
```

```
I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*
x)*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 + 1)) + (a^4*x^4 + 2*a^2*
x^2 + 1)*arctan(a*x)*log_integral(-(a^2*x^2 - 2*I*a*x - 1)/(a^2*x^2 + 1)) -
 4*a*x)/((a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)*arctan(a*x))
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.22, size = 60, normalized size = 0.98

$$\frac{4\,\mathrm{Ci}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)+4\,\mathrm{Ci}\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)-2\sin\left(2\arctan\left(ax\right)\right)-\sin\left(4\arctan\left(ax\right)\right)}{8a^{2}c^{3}\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] 1/8/a^2/c^3*(4*Ci(2*arctan(a*x))*arctan(a*x)+4*Ci(4*arctan(a*x))*arctan(a*x
)-2*sin(2*arctan(a*x))-sin(4*arctan(a*x)))/arctan(a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(a^{5}c^{3}x^{4}+2\,a^{3}c^{3}x^{2}+ac^{3}\right)sage_{0}x\arctan\left(ax\right)+x}{\left(a^{5}c^{3}x^{4}+2\,a^{3}c^{3}x^{2}+ac^{3}\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x)*integrate((3*a^2*x^2 -
1)/((a^7*c^3*x^6 + 3*a^5*c^3*x^4 + 3*a^3*c^3*x^2 + a*c^3)*arctan(a*x)), x)
+ x)/((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{6}x^{6}\operatorname{atan}^{2}{\left(ax \right)}+3a^{4}x^{4}\operatorname{atan}^{2}{\left(ax \right)}+3a^{2}x^{2}\operatorname{atan}^{2}{\left(ax \right)}+\operatorname{atan}^{2}{\left(ax \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(x/(a**6*x**6*atan(a*x)**2 + 3*a**4*x**4*atan(a*x)**2 + 3*a**2*x**2
*atan(a*x)**2 + atan(a*x)**2), x)/c**3
```

3.562 $\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} \, dx$

Optimal. Leaf size=58

$$-\frac{1}{ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{ac^3}-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{2ac^3}$$

```
[Out] -1/a/c^3/(a^2*x^2+1)^2/arctan(a*x)-Si(2*arctan(a*x))/a/c^3-1/2*Si(4*arctan(
a*x))/a/c^3
```

Rubi [A] time = 0.11, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {4902, 4970, 4406, 3299}

$$-\frac{1}{ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{ac^3}-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{2ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x])) - SinIntegral[2*ArcTan[a*x]]/(a*c^
3) - SinIntegral[4*ArcTan[a*x]]/(2*a*c^3)
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}\,dx = -\frac{1}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - (4a)\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx$$

$$= -\frac{1}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{4\,\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{ac^3}$$

$$= -\frac{1}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{4\,\text{Subst}\left(\int \left(\frac{\sin(2x)}{4x}+\frac{\sin(4x)}{8x}\right)dx, x, \tan^{-1}(ax)\right)}{ac^3}$$

$$= -\frac{1}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{\text{Subst}\left(\int \frac{\sin(4x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{2ac^3} - \text{Subst}\left(\int \frac{\text{si}}{}\right.$$

$$= -\frac{1}{ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{ac^3} - \frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{2ac^3}$$

Mathematica [A] time = 0.12, size = 45, normalized size = 0.78

$$-\frac{\frac{1}{\left(a^2x^2+1\right)^2\tan^{-1}(ax)} + \text{Si}\left(2\tan^{-1}(ax)\right) + \frac{1}{2}\text{Si}\left(4\tan^{-1}(ax)\right)}{ac^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] -((1/((1 + a^2*x^2)^2*ArcTan[a*x]) + SinIntegral[2*ArcTan[a*x]] + SinIntegr
al[4*ArcTan[a*x]]/2)/(a*c^3))
```

fricas [C] time = 0.49, size = 285, normalized size = 4.91

$$\left(-i\,a^4x^4 - 2i\,a^2x^2 - i\right)\arctan(ax)\,\text{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right) + \left(i\,a^4x^4 + 2i\,a^2x^2 + i\right)\arctan(ax)\,\text{lo}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] 1/4*((-I*a^4*x^4 - 2*I*a^2*x^2 - I)*arctan(a*x)*log_integral((a^4*x^4 + 4*I
*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (I*a^4*x^4
 + 2*I*a^2*x^2 + I)*arctan(a*x)*log_integral((a^4*x^4 - 4*I*a^3*x^3 - 6*a^2
*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (-2*I*a^4*x^4 - 4*I*a^2*x^
2 - 2*I)*arctan(a*x)*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 + 1)) +
 (2*I*a^4*x^4 + 4*I*a^2*x^2 + 2*I)*arctan(a*x)*log_integral(-(a^2*x^2 - 2*I
*a*x - 1)/(a^2*x^2 + 1)) - 4)/((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan
(a*x))
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.28, size = 59, normalized size = 1.02

$$-\frac{8\,\mathrm{Si}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)+4\,\mathrm{Si}\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)+4\cos\left(2\arctan\left(ax\right)\right)+\cos\left(4\arctan\left(ax\right)\right)+}{8a\,c^{3}\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] -1/8/a/c^3*(8*Si(2*arctan(a*x))*arctan(a*x)+4*Si(4*arctan(a*x))*arctan(a*x)
+4*cos(2*arctan(a*x))+cos(4*arctan(a*x))+3)/arctan(a*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{4\left(a^{6}c^{3}x^{4}+2\,a^{4}c^{3}x^{2}+a^{2}c^{3}\right)\arctan\left(ax\right)\int\frac{x}{\left(a^{6}c^{3}x^{6}+3\,a^{4}c^{3}x^{4}+3\,a^{2}c^{3}x^{2}+c^{3}\right)\arctan\left(ax\right)}\,dx+1}{\left(a^{5}c^{3}x^{4}+2\,a^{3}c^{3}x^{2}+ac^{3}\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -(8*(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)*arctan(a*x)*integrate(1/2*x/((a
^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)), x) + 1)/((a
^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x))
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6}x^{6}\operatorname{atan}^{2}{\left(ax\right)}+3a^{4}x^{4}\operatorname{atan}^{2}{\left(ax\right)}+3a^{2}x^{2}\operatorname{atan}^{2}{\left(ax\right)}+\operatorname{atan}^{2}{\left(ax\right)}}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**6*x**6*atan(a*x)**2 + 3*a**4*x**4*atan(a*x)**2 + 3*a**2*x**2
*atan(a*x)**2 + atan(a*x)**2), x)/c**3
```

3.563 $\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=113

$$-\frac{\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)},x\right)}{ac^3}+\frac{ax}{c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{ax}{c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}-\frac{3\text{Ci}\left(2\tan^{-1}(ax)\right)}{2c^3}-\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{2c^3}-$$

```
[Out] -1/a/c^3/x/arctan(a*x)+a*x/c^3/(a^2*x^2+1)^2/arctan(a*x)+a*x/c^3/(a^2*x^2+1
)/arctan(a*x)-3/2*Ci(2*arctan(a*x))/c^3-1/2*Ci(4*arctan(a*x))/c^3-Unintegra
ble(1/x^2/arctan(a*x),x)/a/c^3
```

Rubi [A] time = 0.66, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^3*x*ArcTan[a*x])) + (a*x)/(c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) + (a*x
)/(c^3*(1 + a^2*x^2)*ArcTan[a*x]) - (3*CosIntegral[2*ArcTan[a*x]])/(2*c^3)
- CosIntegral[4*ArcTan[a*x]]/(2*c^3) - Defer[Int][1/(x^2*ArcTan[a*x]), x]/(
a*c^3)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx=-\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx}{c}$$

$$=\frac{ax}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-a\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx+\left(3a^3\right)\int$$

$$=-\frac{1}{ac^3x\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-$$

$$=-\frac{1}{ac^3x\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-$$

$$=-\frac{1}{ac^3x\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-$$

$$=-\frac{1}{ac^3x\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-$$

$$=-\frac{1}{ac^3x\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{ax}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-$$

Mathematica [A] time = 1.78, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x)*arctan(a*
x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.65, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^2c\,x^2+c\right)^3\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
[Out] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(a^5c^3x^5+2\,a^3c^3x^3+ac^3x\right)sage_0x\arctan\left(ax\right)+1}{\left(a^5c^3x^5+2\,a^3c^3x^3+ac^3x\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
[Out] -((a^5*c^3*x^5 + 2*a^3*c^3*x^3 + a*c^3*x)*arctan(a*x)*integrate((5*a^2*x^2
+ 1)/((a^7*c^3*x^8 + 3*a^5*c^3*x^6 + 3*a^3*c^3*x^4 + a*c^3*x^2)*arctan(a*x)
), x) + 1)/((a^5*c^3*x^5 + 2*a^3*c^3*x^3 + a*c^3*x)*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^7\operatorname{atan}^2(ax)+3a^4x^5\operatorname{atan}^2(ax)+3a^2x^3\operatorname{atan}^2(ax)+x\operatorname{atan}^2(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**6*x**7*atan(a*x)**2 + 3*a**4*x**5*atan(a*x)**2 + 3*a**2*x**3
*atan(a*x)**2 + x*atan(a*x)**2), x)/c**3
```

3.564 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=111

$$-\frac{2\mathrm{Int}\left(\frac{1}{x^3\tan^{-1}(ax)},x\right)}{ac^3}+\frac{a}{c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{a}{c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}+\frac{2a\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{c^3}+\frac{a\mathrm{Si}\left(4\tan^{-1}(ax)\right)}{2c^3}-$$

```
[Out] -1/a/c^3/x^2/arctan(a*x)+a/c^3/(a^2*x^2+1)^2/arctan(a*x)+a/c^3/(a^2*x^2+1)/
arctan(a*x)+2*a*Si(2*arctan(a*x))/c^3+1/2*a*Si(4*arctan(a*x))/c^3-2*Uninteg
rable(1/x^3/arctan(a*x),x)/a/c^3
```

Rubi [A] time = 0.43, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^3*x^2*ArcTan[a*x])) + a/(c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) + a/(c^3
*(1 + a^2*x^2)*ArcTan[a*x]) + (2*a*SinIntegral[2*ArcTan[a*x]])/c^3 + (a*Sin
Integral[4*ArcTan[a*x]])/(2*c^3) - (2*Defer[Int][1/(x^3*ArcTan[a*x]), x])/(
a*c^3)
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx = -\left(a^2\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx}{c}$$

$$= \frac{a}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\left(4a^3\right)\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}\,dx+\frac{\int \frac{1}{x^2\left(c+a^2cx^2\right)\mathrm{t}}}{c^2}$$

$$= -\frac{1}{ac^3x^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\int}{}$$

$$= -\frac{1}{ac^3x^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\int}{}$$

$$= -\frac{1}{ac^3x^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\int}{}$$

$$= -\frac{1}{ac^3x^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{a\mathrm{Si}}{}$$

$$= -\frac{1}{ac^3x^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{a}{c^3\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{2a\mathrm{S}}{}$$

Mathematica [A] time = 2.34, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4 + c^3*x^2)*arctan(
a*x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a^2c\,x^2+c\right)^3\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
[Out] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\left(a^5c^3x^6+2\,a^3c^3x^4+ac^3x^2\right)\arctan\left(ax\right)\int\frac{3\,a^2x^2+1}{\left(a^7c^3x^9+3\,a^5c^3x^7+3\,a^3c^3x^5+ac^3x^3\right)\arctan(ax)}\,dx+1}{\left(a^5c^3x^6+2\,a^3c^3x^4+ac^3x^2\right)\arctan\left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
[Out] -((a^5*c^3*x^6 + 2*a^3*c^3*x^4 + a*c^3*x^2)*arctan(a*x)*integrate(2*(3*a^2*
x^2 + 1)/((a^7*c^3*x^9 + 3*a^5*c^3*x^7 + 3*a^3*c^3*x^5 + a*c^3*x^3)*arctan(
a*x)), x) + 1)/((a^5*c^3*x^6 + 2*a^3*c^3*x^4 + a*c^3*x^2)*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^8\operatorname{atan}^2(ax)+3a^4x^6\operatorname{atan}^2(ax)+3a^2x^4\operatorname{atan}^2(ax)+x^2\operatorname{atan}^2(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**6*x**8*atan(a*x)**2 + 3*a**4*x**6*atan(a*x)**2 + 3*a**2*x**4
*atan(a*x)**2 + x**2*atan(a*x)**2), x)/c**3
```

3.565 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=159

$$-\frac{3\text{Int}\left(\frac{1}{x^4\tan^{-1}(ax)},x\right)}{ac^3}+\frac{2a\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)},x\right)}{c^3}+\frac{5a^2\text{Ci}\left(2\tan^{-1}(ax)\right)}{2c^3}+\frac{a^2\text{Ci}\left(4\tan^{-1}(ax)\right)}{2c^3}-\frac{2a^3x}{c^3\left(a^2x^2+1\right)\tan^{-1}(ax}$$

```
[Out] -1/a/c^3/x^3/arctan(a*x)+2*a/c^3/x/arctan(a*x)-a^3*x/c^3/(a^2*x^2+1)^2/arct
an(a*x)-2*a^3*x/c^3/(a^2*x^2+1)/arctan(a*x)+5/2*a^2*Ci(2*arctan(a*x))/c^3+1
/2*a^2*Ci(4*arctan(a*x))/c^3-3*Unintegrable(1/x^4/arctan(a*x),x)/a/c^3+2*a*
Unintegrable(1/x^2/arctan(a*x),x)/c^3
```

Rubi [A] time = 1.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^3*x^3*ArcTan[a*x])) + (2*a)/(c^3*x*ArcTan[a*x]) - (a^3*x)/(c^3*(1
+ a^2*x^2)^2*ArcTan[a*x]) - (2*a^3*x)/(c^3*(1 + a^2*x^2)*ArcTan[a*x]) + (5*
a^2*CosIntegral[2*ArcTan[a*x]])/(2*c^3) + (a^2*CosIntegral[4*ArcTan[a*x]])/
(2*c^3) - (3*Defer[Int][1/(x^4*ArcTan[a*x]), x])/(a*c^3) + (2*a*Defer[Int][
1/(x^2*ArcTan[a*x]), x])/c^3
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}dx = -\left(a^2\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}dx\right)+\frac{\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}dx}{c}$$

$$= a^4\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}dx+\frac{\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}dx}{c^2}-2\frac{a^2\int \frac{1}{x\left(c+a^2cx^2\right)^2}}{c}$$

$$= -\frac{1}{ac^3x^3\tan^{-1}(ax)}-\frac{a^3x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+a^3\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)}d$$

$$= -\frac{1}{ac^3x^3\tan^{-1}(ax)}-\frac{a^3x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}dx}{ac^3}+\frac{a^2\,\mathrm{Subst}\big(}{}$$

$$= -\frac{1}{ac^3x^3\tan^{-1}(ax)}-\frac{a^3x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}dx}{ac^3}+\frac{a^2\,\mathrm{Subst}\big(}{}$$

$$= -\frac{1}{ac^3x^3\tan^{-1}(ax)}-\frac{a^3x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)}dx}{ac^3}+\frac{a^2\,\mathrm{Subst}\big(}{}$$

$$= -\frac{1}{ac^3x^3\tan^{-1}(ax)}-\frac{a^3x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{a^2\mathrm{Ci}\left(2\tan^{-1}(ax)\right)}{2c^3}+\frac{a^2\mathrm{Ci}\big(4}{}$$

$$= -\frac{1}{ac^3x^3\tan^{-1}(ax)}-\frac{a^3x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{a^2\mathrm{Ci}\left(2\tan^{-1}(ax)\right)}{2c^3}+\frac{a^2\mathrm{Ci}\big(4}{}$$

Mathematica [A] time = 3.22, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{\left(a^6c^3x^9+3\,a^4c^3x^7+3\,a^2c^3x^5+c^3x^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^6*c^3*x^9 + 3*a^4*c^3*x^7 + 3*a^2*c^3*x^5 + c^3*x^3)*arctan(
a*x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 4.03, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c \,x^{2}+c\right)^{3} \arctan \left(a x\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\left(a^{5} c^{3} x^{7}+2 \, a^{3} c^{3} x^{5}+a c^{3} x^{3}\right) sage_{0} x \arctan \left(a x\right)+1}{\left(a^{5} c^{3} x^{7}+2 \, a^{3} c^{3} x^{5}+a c^{3} x^{3}\right) \arctan \left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -((a^5*c^3*x^7 + 2*a^3*c^3*x^5 + a*c^3*x^3)*arctan(a*x)*integrate((7*a^2*x^
2 + 3)/((a^7*c^3*x^10 + 3*a^5*c^3*x^8 + 3*a^3*c^3*x^6 + a*c^3*x^4)*arctan(a
*x)), x) + 1)/((a^5*c^3*x^7 + 2*a^3*c^3*x^5 + a*c^3*x^3)*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^2\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{9} \operatorname{atan}^{2}{\left(a x \right)} + 3 a^{4} x^{7} \operatorname{atan}^{2}{\left(a x \right)} + 3 a^{2} x^{5} \operatorname{atan}^{2}{\left(a x \right)} + x^{3} \operatorname{atan}^{2}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**6*x**9*atan(a*x)**2 + 3*a**4*x**7*atan(a*x)**2 + 3*a**2*x**5
*atan(a*x)**2 + x**3*atan(a*x)**2), x)/c**3
```

3.566 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=155

$$-\frac{4\mathrm{Int}\left(\frac{1}{x^5\tan^{-1}(ax)},x\right)}{ac^3}+\frac{4a\mathrm{Int}\left(\frac{1}{x^3\tan^{-1}(ax)},x\right)}{c^3}-\frac{3a^3\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{c^3}-\frac{a^3\mathrm{Si}\left(4\tan^{-1}(ax)\right)}{2c^3}-\frac{2a^3}{c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{}{c^3}$$

```
[Out] -1/a/c^3/x^4/arctan(a*x)+2*a/c^3/x^2/arctan(a*x)-a^3/c^3/(a^2*x^2+1)^2/arct
an(a*x)-2*a^3/c^3/(a^2*x^2+1)/arctan(a*x)-3*a^3*Si(2*arctan(a*x))/c^3-1/2*a
^3*Si(4*arctan(a*x))/c^3-4*Unintegrable(1/x^5/arctan(a*x),x)/a/c^3+4*a*Unin
tegrable(1/x^3/arctan(a*x),x)/c^3
```

Rubi [A] time = 0.90, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c^3*x^4*ArcTan[a*x])) + (2*a)/(c^3*x^2*ArcTan[a*x]) - a^3/(c^3*(1 +
a^2*x^2)^2*ArcTan[a*x]) - (2*a^3)/(c^3*(1 + a^2*x^2)*ArcTan[a*x]) - (3*a^3*
SinIntegral[2*ArcTan[a*x]])/c^3 - (a^3*SinIntegral[4*ArcTan[a*x]])/(2*c^3)
- (4*Defer[Int][1/(x^5*ArcTan[a*x]), x])/(a*c^3) + (4*a*Defer[Int][1/(x^3*A
rcTan[a*x]), x])/c^3
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx = -\left(a^2\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx\right) + \frac{\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx}{c}$$

$$= a^4\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx + \frac{\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^2}\,dx}{c^2} - 2\frac{a^2\int \frac{}{x^2\left(c+a^2\right.}}{}$$

$$= -\frac{1}{ac^3x^4\tan^{-1}(ax)} - \frac{a^3}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \left(4a^5\right)\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}}$$

$$= -\frac{1}{ac^3x^4\tan^{-1}(ax)} - \frac{a^3}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{4\int \frac{1}{x^5\tan^{-1}(ax)}\,dx}{ac^3} - \frac{\left(4a^3\right)\mathrm{S}}{}$$

$$= -\frac{1}{ac^3x^4\tan^{-1}(ax)} - \frac{a^3}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{4\int \frac{1}{x^5\tan^{-1}(ax)}\,dx}{ac^3} - 2\left(-\frac{}{c^3x}\right.$$

$$= -\frac{1}{ac^3x^4\tan^{-1}(ax)} - \frac{a^3}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{4\int \frac{1}{x^5\tan^{-1}(ax)}\,dx}{ac^3} - \frac{a^3\,\mathrm{Subs}}{}$$

$$= -\frac{1}{ac^3x^4\tan^{-1}(ax)} - \frac{a^3}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{a^3\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{c^3} - \frac{a^3\mathrm{Si}\left(\right.}{}$$

$$= -\frac{1}{ac^3x^4\tan^{-1}(ax)} - \frac{a^3}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)} - \frac{a^3\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{c^3} - \frac{a^3\mathrm{Si}\left(\right.}{}$$

Mathematica [A] time = 3.96, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{\left(a^6c^3x^{10}+3\,a^4c^3x^8+3\,a^2c^3x^6+c^3x^4\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(1/((a^6*c^3*x^10 + 3*a^4*c^3*x^8 + 3*a^2*c^3*x^6 + c^3*x^4)*arctan
(a*x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.55, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{4 \left(a^{5} c^{3} x^{8}+2 \, a^{3} c^{3} x^{6}+a c^{3} x^{4}\right) \arctan \left(a x\right) \int \frac{2 \, a^{2} x^{2}+1}{\left(a^{7} c^{3} x^{11}+3 \, a^{5} c^{3} x^{9}+3 \, a^{3} c^{3} x^{7}+a c^{3} x^{5}\right) \arctan \left(a x\right)}\,{d x}+1}{\left(a^{5} c^{3} x^{8}+2 \, a^{3} c^{3} x^{6}+a c^{3} x^{4}\right) \arctan \left(a x\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] -((a^5*c^3*x^8 + 2*a^3*c^3*x^6 + a*c^3*x^4)*arctan(a*x)*integrate(4*(2*a^2*
x^2 + 1)/((a^7*c^3*x^11 + 3*a^5*c^3*x^9 + 3*a^3*c^3*x^7 + a*c^3*x^5)*arctan
(a*x)), x) + 1)/((a^5*c^3*x^8 + 2*a^3*c^3*x^6 + a*c^3*x^4)*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^2\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{10} \operatorname{atan}^{2}{\left (a x \right)} + 3 a^{4} x^{8} \operatorname{atan}^{2}{\left (a x \right)} + 3 a^{2} x^{6} \operatorname{atan}^{2}{\left (a x \right)} + x^{4} \operatorname{atan}^{2}{\left (a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
```

```
[Out] Integral(1/(a**6*x**10*atan(a*x)**2 + 3*a**4*x**8*atan(a*x)**2 + 3*a**2*x**
6*atan(a*x)**2 + x**4*atan(a*x)**2), x)/c**3
```

3.567 $\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\operatorname{Int}\left(\frac{x\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2,x]
[Out] Defer[Int][(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2}\,dx = \int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 1.68, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2,x]
[Out] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x/arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{a^{2}c\,x^{2}+c}}{\arctan\left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
[Out] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2}cx^{2}+c}\,x}{\arctan\left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*x/arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\sqrt{c\,a^{2}\,x^{2}+c}}{\mathrm{atan}\left(a\,x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^2,x)
[Out] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c\left(a^{2}x^{2}+1\right)}}{\operatorname{atan}^{2}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(1/2)/atan(a*x)**2,x)
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))/atan(a*x)**2, x)
```

3.568 $\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^2,x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx = \int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^2,x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c \,x^{2}+c}}{\arctan \left(a x \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
[Out] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2}cx^{2}+c}}{\arctan \left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)/arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^2,x)
[Out] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/atan(a*x)**2,x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/atan(a*x)**2, x)
```

3.569 $\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{x\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^2,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^2),x]
```

```
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^2}\,dx=\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 3.64, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{x\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/(x*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.54, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c\,x^{2}+c}}{x \arctan \left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^2,x)
[Out] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2}+c}}{x \arctan \left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)/(x*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^{2}\,x^{2}+c}}{x\,\mathrm{atan}\left(a\,x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^2),x)
[Out] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2}+1\right)}}{x \operatorname{atan}^{2}\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/x/atan(a*x)**2,x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/(x*atan(a*x)**2), x)
```

3.570 $\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^2},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2,x]

[Out] Defer[Int][(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2, x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 4.20, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2,x]

[Out] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2, x]

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^3+cx\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")

[Out] integral((a^2*c*x^3 + c*x)*sqrt(a^2*c*x^2 + c)/arctan(a*x)^2, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 1.79, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}{\arctan\left(a x\right)^{2}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
[Out] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{3}{2}} x}{\arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x/arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^2,x)
[Out] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)/atan(a*x)**2, x)
```

3.571 $\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^2,x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx = \int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.99, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^2,x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)/arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\,x^2+c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
[Out] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)/arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^2,x)
[Out] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}^2\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/atan(a*x)**2, x)
```

3.572 $\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{x\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^2),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^2}\,dx=\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 4.40, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}}{x\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)/(x*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.69, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{x \arctan \left(a x \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^2,x)
[Out] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{3}{2}}}{x \arctan \left(a x\right)^{2}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)/(x*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^2),x)
[Out] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{x \operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/x/atan(a*x)**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/(x*atan(a*x)**2), x)
```

3.573 $\int \frac{x(c+a^2cx^2)^{5/2}}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2,x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 2.11, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2,x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*sqrt(a^2*c*x^2 + c)/arctan(a
*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.95, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{\arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)

[Out] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}} x}{\arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(5/2)*x/arctan(a*x)^2, x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\left(c\,a^{2}\,x^{2}+c\right)^{5/2}}{\mathrm{atan}\left(a\,x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^2,x)

[Out] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^2, x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(c\left(a^{2} x^{2}+1\right)\right)^{\frac{5}{2}}}{\operatorname{atan}^{2}\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)

[Out] Integral(x*(c*(a**2*x**2 + 1))**(5/2)/atan(a*x)**2, x)

3.574 $\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=24

$$\operatorname{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^2,x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^2,x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)/arctan(a*x
)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.28, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c\right)^{\frac{5}{2}}}{\arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
[Out] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}}}{\arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)/arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^2,x)
[Out] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2}+1\right)\right)^{\frac{5}{2}}}{\operatorname{atan}^{2}{\left(a x \right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)/atan(a*x)**2, x)
```

3.575 $\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{(a^2cx^2+c)^{5/2}}{x\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^2),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^2}\,dx=\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 2.40, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(a^4c^2x^4+2\,a^2c^2x^2+c^2)\sqrt{a^2cx^2+c}}{x\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)/(x*arctan(
a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.54, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{x \arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^2,x)
[Out] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}}}{x \arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)/(x*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^2),x)
[Out] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2}+1\right)\right)^{\frac{5}{2}}}{x \operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/x/atan(a*x)**2,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)/(x*atan(a*x)**2), x)
```

3.576 $\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
[Out] Defer[Int][x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx = \int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 1.24, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
[Out] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x}{\sqrt{a^2cx^2+c}\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{x}{\arctan(ax)^2\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{a^2cx^2 + c}\,\arctan(ax)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(x/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^2\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^2\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2), x)
```

3.577 $\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
[Out] Defer[Int][1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx = \int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.65, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
[Out] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\sqrt{a^2cx^2+c}\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(1/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.73, size = 0, normalized size = 0.00

$$\int \frac{1}{\arctan \left(a x\right)^{2} \sqrt{a^{2} c \,x^{2}+c}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^{2} c x^{2} + c} \arctan\left(a x\right)^{2}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{{\mathrm{atan}\left(a\,x\right)}^2\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c \left(a^{2} x^{2} + 1\right)} \operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2), x)
```

3.578 $\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=64

$$-\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)},x\right)}{a}-\frac{\sqrt{a^2cx^2+c}}{acx\tan^{-1}(ax)}$$

```
[Out] -(a^2*c*x^2+c)^(1/2)/a/c/x/arctan(a*x)-Unintegrable(1/x^2/arctan(a*x)/(a^2*
c*x^2+c)^(1/2),x)/a
```

Rubi [A] time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
```

```
[Out] -(Sqrt[c + a^2*c*x^2]/(a*c*x*ArcTan[a*x])) - Defer[Int][1/(x^2*Sqrt[c + a^2
*c*x^2]*ArcTan[a*x]), x]/a
```

Rubi steps

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx=-\frac{\sqrt{c+a^2cx^2}}{acx\tan^{-1}(ax)}-\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx}{a}$$

Mathematica [A] time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^2cx^3+cx\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^2*c*x^3 + c*x)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{1}{x \arctan\left(ax\right)^{2} \sqrt{a^{2} c\, x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^{2} c x^{2}+c}\, x \arctan\left(ax\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*x*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x\, \mathrm{atan}\left(a\, x\right)^{2} \sqrt{c\, a^{2}\, x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \sqrt{c \left(a^{2} x^{2}+1\right)}\, \mathrm{atan}^{2}\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2), x)
```

3.579 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=101

$$\frac{\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{a^2c}-\frac{\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{a^4c\sqrt{a^2cx^2+c}}+\frac{x}{a^3c\sqrt{a^2cx^2+c}\tan^{-1}(ax)}$$

```
[Out] x/a^3/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)-Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a
^4/c/(a^2*c*x^2+c)^(1/2)+Unintegrable(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x
)/a^2/c
```

Rubi [A] time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] x/(a^3*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) - (Sqrt[1 + a^2*x^2]*CosIntegral[
ArcTan[a*x]])/(a^4*c*Sqrt[c + a^2*c*x^2]) + Defer[Int][x/(Sqrt[c + a^2*c*x^
2]*ArcTan[a*x]^2), x]/(a^2*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx &= -\frac{\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{a^2}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}\\
&= \frac{x}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx}{a^3}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}\\
&= \frac{x}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}-\frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\ldots}}{a^3c\sqrt{c+a^2cx^2}}\\
&= \frac{x}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}-\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \ldots\right)}{a^4c\sqrt{c+\ldots}}\\
&= \frac{x}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{a^4c\sqrt{c+a^2cx^2}}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}
\end{aligned}$$

Mathematica [A] time = 9.96, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.20, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^3/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^2\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.580 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=98

$$\frac{\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{a^2c}+\frac{\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{a^3c\sqrt{a^2cx^2+c}}+\frac{1}{a^3c\sqrt{a^2cx^2+c}\tan^{-1}(ax)}$$

```
[Out] 1/a^3/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)+Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a
^3/c/(a^2*c*x^2+c)^(1/2)+Unintegrable(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x
)/a^2/c
```

Rubi [A] time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] 1/(a^3*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) + (Sqrt[1 + a^2*x^2]*SinIntegral[
ArcTan[a*x]])/(a^3*c*Sqrt[c + a^2*c*x^2]) + Defer[Int][1/(Sqrt[c + a^2*c*x^
2]*ArcTan[a*x]^2), x]/(a^2*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx &= -\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{a^2}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}\\
&= \frac{1}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx}{a}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}\\
&= \frac{1}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}+\frac{\sqrt{1+a^2x^2}\int \frac{x}{\left(1+a^2x^2\right)^{3/2}\tan}}{ac\sqrt{c+a^2cx^2}}\\
&= \frac{1}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(x}{x}\right.}{a^3c\sqrt{c+a^2}}\\
&= \frac{1}{a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{a^3c\sqrt{c+a^2cx^2}}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{a^2c}
\end{aligned}$$

Mathematica [A] time = 8.91, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.30, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^2/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^2\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.581 $\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=69

$$\frac{\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{a^2c\sqrt{a^2cx^2+c}}-\frac{x}{ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

```
[Out] -x/a/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)+Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^
2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.17, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4942, 4905, 4904, 3302}

$$\frac{\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(\tan^{-1}(ax)\right)}{a^2c\sqrt{a^2cx^2+c}}-\frac{x}{ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(x/(a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])) + (Sqrt[1 + a^2*x^2]*CosIntegral
[ArcTan[a*x]])/(a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx = -\frac{x}{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx}{a}$$

$$= -\frac{x}{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\tan^{-1}(ax)}\,dx}{ac\sqrt{c+a^2cx^2}}$$

$$= -\frac{x}{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^2c\sqrt{c+a^2cx^2}}$$

$$= -\frac{x}{ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{a^2c\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.10, size = 55, normalized size = 0.80

$$\frac{\sqrt{a^2x^2+1}\,\tan^{-1}(ax)\text{Ci}\left(\tan^{-1}(ax)\right)-ax}{a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] (-(a*x) + Sqrt[1 + a^2*x^2]*ArcTan[a*x]*CosIntegral[ArcTan[a*x]])/(a^2*c*Sq
rt[c + a^2*c*x^2]*ArcTan[a*x])
```

fricas [F] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(
a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 1.12, size = 210, normalized size = 3.04

$$-\frac{\left(\arctan\left(ax\right)\text{Ei}\left(1,-i\arctan\left(ax\right)\right)x^2a^2+\text{Ei}\left(1,-i\arctan\left(ax\right)\right)\arctan\left(ax\right)+\sqrt{a^2x^2+1}\,xa-i\sqrt{a^2x^2+1}\right)\sqrt{c\,(ax}}{2\left(a^2x^2+1\right)^{\frac{3}{2}}\arctan\left(ax\right)c^2a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] -1/2*(arctan(a*x)*Ei(1,-I*arctan(a*x))*x^2*a^2+Ei(1,-I*arctan(a*x))*arctan(
a*x)+(a^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I
)*(I+a*x))^(1/2)/arctan(a*x)/c^2/a^2-1/2*(Ei(1,I*arctan(a*x))*arctan(a*x)*x
^2*a^2+Ei(1,I*arctan(a*x))*arctan(a*x)+(a^2*x^2+1)^(1/2)*x*a+I*(a^2*x^2+1)^
(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)/c^2/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(x/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^2\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Integral(x/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.582 $\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=69

$$-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{ac\sqrt{a^2cx^2+c}}-\frac{1}{ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

```
[Out] -1/a/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)-Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a/
c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4902, 4971, 4970, 3299}

$$-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{ac\sqrt{a^2cx^2+c}}-\frac{1}{ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])) - (Sqrt[1 + a^2*x^2]*SinIntegral
[ArcTan[a*x]])/(a*c*Sqrt[c + a^2*c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx = -\frac{1}{ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)} - a\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx$$
$$= -\frac{1}{ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)} - \frac{\left(a\sqrt{1+a^2x^2}\right)\int \frac{x}{\left(1+a^2x^2\right)^{3/2}\tan^{-1}(ax)}\,dx}{c\sqrt{c+a^2cx^2}}$$
$$= -\frac{1}{ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{ac\sqrt{c+a^2cx^2}}$$
$$= -\frac{1}{ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{ac\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.11, size = 53, normalized size = 0.77

$$-\frac{\sqrt{a^2x^2+1}\tan^{-1}(ax)\text{Si}\left(\tan^{-1}(ax)\right)+1}{ac\sqrt{a^2cx^2+c}\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] -((1 + Sqrt[1 + a^2*x^2]*ArcTan[a*x]*SinIntegral[ArcTan[a*x]])/(a*c*Sqrt[c
+ a^2*c*x^2]*ArcTan[a*x]))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*
x)^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.64, size = 212, normalized size = 3.07

$$\frac{i\left(\text{Ei}(1, i\arctan(ax))\arctan(ax)x^2a^2+\text{Ei}(1, i\arctan(ax))\arctan(ax)+\sqrt{a^2x^2+1}\,xa+i\sqrt{a^2x^2+1}\right)\sqrt{c\,(ax}}{2\left(a^2x^2+1\right)^{\frac{3}{2}}\arctan(ax)c^2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] 1/2*I*(Ei(1,I*arctan(a*x))*arctan(a*x)*x^2*a^2+Ei(1,I*arctan(a*x))*arctan(a
*x)+(a^2*x^2+1)^(1/2)*x*a+I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)
*(I+a*x))^(1/2)/arctan(a*x)/c^2/a-1/2*I*(arctan(a*x)*Ei(1,-I*arctan(a*x))*x
^2*a^2+Ei(1,-I*arctan(a*x))*arctan(a*x)+(a^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)
^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)/c^2/a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}} \arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}} \operatorname{atan}^{2}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
[Out] Integral(1/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.583 $\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=130

$$-\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)},x\right)}{ac}-\frac{\sqrt{a^2cx^2+c}}{ac^2x\tan^{-1}(ax)}-\frac{\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{c\sqrt{a^2cx^2+c}}+\frac{ax}{c\sqrt{a^2cx^2+c}\tan^{-1}(ax)}$$

```
[Out] a*x/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)-Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/c/(
a^2*c*x^2+c)^(1/2)-(a^2*c*x^2+c)^(1/2)/a/c^2/x/arctan(a*x)-Unintegrable(1/x
^2/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)/a/c
```

Rubi [A] time = 0.51, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] (a*x)/(c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) - Sqrt[c + a^2*c*x^2]/(a*c^2*x*Ar
cTan[a*x]) - (Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(c*Sqrt[c + a^2*c
*x^2]) - Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]/(a*c)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx=-\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}$$

$$=\frac{ax}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{\sqrt{c+a^2cx^2}}{ac^2x\tan^{-1}(ax)}-a\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,d$$

$$=\frac{ax}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{\sqrt{c+a^2cx^2}}{ac^2x\tan^{-1}(ax)}-\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx}{ac}-\frac{\left(a\sqrt{\right.}}{}$$

$$=\frac{ax}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{\sqrt{c+a^2cx^2}}{ac^2x\tan^{-1}(ax)}-\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\,dx}{ac}-\frac{\sqrt{1-}}{}$$

$$=\frac{ax}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{\sqrt{c+a^2cx^2}}{ac^2x\tan^{-1}(ax)}-\frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{c\sqrt{c+a^2cx^2}}-\frac{\int}{}$$

Mathematica [A] time = 2.05, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.60, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*arctan(
a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.01, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^2\,\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\mathrm{atan}^2\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.584 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=94

$$\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2},x\right)}{c}+\frac{a\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{c\sqrt{a^2cx^2+c}}+\frac{a}{c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

```
[Out] a/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)+a*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/c/(
a^2*c*x^2+c)^(1/2)+Unintegrable(1/x^2/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/
c
```

Rubi [A] time = 0.43, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] a/(c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) + (a*Sqrt[1 + a^2*x^2]*SinIntegral[Ar
cTan[a*x]])/(c*Sqrt[c + a^2*c*x^2]) + Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]
*ArcTan[a*x]^2), x]/c
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx &= -\left(a^2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}\,dx}{c}\\
&= \frac{a}{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+a^3\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}\,dx}{c}\\
&= \frac{a}{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}\,dx}{c}+\frac{\left(a^3\sqrt{1+a^2x^2}\right)\int \frac{}{(1+a^2}}{c\sqrt{c+a^2c}}\\
&= \frac{a}{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}\,dx}{c}+\frac{\left(a\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int\right.}{c\sqrt{c+}}\\
&= \frac{a}{c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+\frac{a\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{c\sqrt{c+a^2cx^2}}+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}}{c}
\end{aligned}$$

Mathematica [A] time = 3.70, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^6+2\,a^2c^2x^4+c^2x^2\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arcta
n(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.07, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^2\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x^2*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^2\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(x**2*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.585 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=160

$$\frac{a\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)},x\right)}{c}+\frac{\text{Int}\left(\frac{1}{x^3\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{c}+\frac{a\sqrt{a^2cx^2+c}}{c^2x\tan^{-1}(ax)}+\frac{a^2\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{c\sqrt{a^2cx^2+c}}-\frac{}{c\sqrt{a^2cx^2+\cdots}}$$

```
[Out] -a^3*x/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)+a^2*Ci(arctan(a*x))*(a^2*x^2+1)^(1
/2)/c/(a^2*c*x^2+c)^(1/2)+a*(a^2*c*x^2+c)^(1/2)/c^2/x/arctan(a*x)+Unintegra
ble(1/x^3/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/c+a*Unintegrable(1/x^2/arcta
n(a*x)/(a^2*c*x^2+c)^(1/2),x)/c
```

Rubi [A] time = 0.74, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] -((a^3*x)/(c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])) + (a*Sqrt[c + a^2*c*x^2])/(c
^2*x*ArcTan[a*x]) + (a^2*Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(c*Sqr
t[c + a^2*c*x^2]) + Defer[Int][1/(x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x
]/c + (a*Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x])/c
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx &= -\left(a^2\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}\\
&= a^4\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}-\frac{a^2\int \frac{}{x\sqrt{c+a^2cx\cdots}}}{\cdots}\\
&= -\frac{a^3x}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{a\sqrt{c+a^2cx^2}}{c^2x\tan^{-1}(ax)}+a^3\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,d\cdots\\
&= -\frac{a^3x}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{a\sqrt{c+a^2cx^2}}{c^2x\tan^{-1}(ax)}+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}+\frac{a\int \cdots}{\cdots}\\
&= -\frac{a^3x}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{a\sqrt{c+a^2cx^2}}{c^2x\tan^{-1}(ax)}+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}+\frac{a\int \cdots}{\cdots}\\
&= -\frac{a^3x}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{a\sqrt{c+a^2cx^2}}{c^2x\tan^{-1}(ax)}+\frac{a^2\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{c\sqrt{c+a^2cx^2}}+\cdots
\end{aligned}$$

Mathematica [A] time = 6.25, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^7+2\,a^2c^2x^5+c^2x^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3)*arcta
n(a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.82, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
[Out] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^3\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x^3*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \left(c \left(a^2 x^2 + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^2 (ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(x**3*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.586 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=135

$$-\frac{a^2\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{c}+\frac{\text{Int}\left(\frac{1}{x^4\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{c}-\frac{a^3\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{c\sqrt{a^2cx^2+c}}-\frac{a^3}{c\sqrt{a^2cx^2+c}\tan^{-1}(}$$

```
[Out] -a^3/c/arctan(a*x)/(a^2*c*x^2+c)^(1/2)-a^3*Si(arctan(a*x))*(a^2*x^2+1)^(1/2
)/c/(a^2*c*x^2+c)^(1/2)+Unintegrable(1/x^4/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2
),x)/c-a^2*Unintegrable(1/x^2/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/c
```

Rubi [A] time = 0.67, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(a^3/(c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])) - (a^3*Sqrt[1 + a^2*x^2]*SinInte
gral[ArcTan[a*x]])/(c*Sqrt[c + a^2*c*x^2]) + Defer[Int][1/(x^4*Sqrt[c + a^2
*c*x^2]*ArcTan[a*x]^2), x]/c - (a^2*Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*A
rcTan[a*x]^2), x])/c
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx=-\left(a^2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}$$

$$=a^4\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}-\frac{a^2\int \frac{}{x^2\sqrt{c}}}{}$$

$$=-\frac{a^3}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-a^5\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}\,dx+\frac{\int \frac{}{x^4\sqrt{c+a^2c}}}{}$$

$$=-\frac{a^3}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}-\frac{a^2\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-}}}{c}$$

$$=-\frac{a^3}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c}-\frac{a^2\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-}}}{c}$$

$$=-\frac{a^3}{c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{a^3\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{c\sqrt{c+a^2cx^2}}+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan}}{c}$$

Mathematica [A] time = 7.01, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^8+2\,a^2c^2x^6+c^2x^4\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^8 + 2*a^2*c^2*x^6 + c^2*x^4)*arcta
n(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.27, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^4\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x^4*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(c \left(a^2x^2 + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^2 (ax)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(x**4*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.587 $\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=177

$$\frac{\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{a^4c^2}-\frac{7\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{4a^6c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{a^2x^2+1}\,\text{Ci}\left(3\tan^{-1}(ax)\right)}{4a^6c^2\sqrt{a^2cx^2+c}}+\frac{x}{a^5c^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}$$

```
[Out] x^3/a^3/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)+x/a^5/c^2/arctan(a*x)/(a^2*c*x^2+
c)^(1/2)-7/4*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2+c)^(1/2)+
3/4*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c*x^2+c)^(1/2)+Uninteg
rable(x/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/a^4/c^2
```

Rubi [A] time = 0.91, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] x^3/(a^3*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) + x/(a^5*c^2*Sqrt[c + a^2*c*x
^2]*ArcTan[a*x]) - (7*Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(4*a^6*c^
2*Sqrt[c + a^2*c*x^2]) + (3*Sqrt[1 + a^2*x^2]*CosIntegral[3*ArcTan[a*x]])/(
4*a^6*c^2*Sqrt[c + a^2*c*x^2]) + Defer[Int][x/(Sqrt[c + a^2*c*x^2]*ArcTan[a
*x]^2), x]/(a^4*c^2)
```

Rubi steps

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\frac{\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx}{a^2} + \frac{\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{a^2c}$$

$$= \frac{x^3}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{a^3} + \frac{\int \frac{x}{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax}}{a^4c^2}$$

$$= \frac{x^3}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{x}{a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{\int \frac{x}{\sqrt{c+a^2cx^2}\,\tan^{-1}(}}{a^4c^2}$$

$$= \frac{x^3}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{x}{a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{\int \frac{x}{\sqrt{c+a^2cx^2}\,\tan^{-1}(}}{a^4c^2}$$

$$= \frac{x^3}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{x}{a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{\int \frac{x}{\sqrt{c+a^2cx^2}\,\tan^{-1}(}}{a^4c^2}$$

$$= \frac{x^3}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{x}{a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\mathrm{Ci}\left(\mathrm{t}\right.}{a^6c^2\sqrt{c+a}}$$

$$= \frac{x^3}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{x}{a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{7\sqrt{1+a^2x^2}\,\mathrm{Ci}\left(\right.}{4a^6c^2\sqrt{c+}}$$

Mathematica [A] time = 12.61, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
[Out] Integrate[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^5}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^5/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 5.70, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2 c\, x^2+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
[Out] int(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2 c x^2+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(x^5/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^5}{\mathrm{atan}\left(a\, x\right)^2\, {\left(c\, a^2\, x^2+c\right)}^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^5/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(c \left(a^2 x^2+1\right)\right)^{\frac{5}{2}} \operatorname{atan}^2\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
[Out] Integral(x**5/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.588 $\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=174

$$\frac{\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{a^4c^2}+\frac{5\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{4a^5c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{a^2x^2+1}\,\text{Si}\left(3\tan^{-1}(ax)\right)}{4a^5c^2\sqrt{a^2cx^2+c}}+\frac{2}{a^5c^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}$$

```
[Out] -1/a^5/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)+2/a^5/c^2/arctan(a*x)/(a^2*c*x^2+c
)^(1/2)+5/4*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)-3
/4*Si(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+c)^(1/2)+Unintegr
able(1/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/a^4/c^2
```

Rubi [A] time = 1.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a^5*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])) + 2/(a^5*c^2*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x]) + (5*Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(4*a^5*c
^2*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/
(4*a^5*c^2*Sqrt[c + a^2*c*x^2]) + Defer[Int][1/(Sqrt[c + a^2*c*x^2]*ArcTan[
a*x]^2), x]/(a^4*c^2)
```

Rubi steps

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\frac{\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}dx}{a^2} + \frac{\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}dx}{a^2c}$$

$$= \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}dx}{a^4} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}dx}{a^4c^2} - 2\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}dx}{a^4c}$$

$$= -\frac{1}{a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}dx}{a^3} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}}{a^4c^2}$$

$$= -\frac{1}{a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}dx}{a^4c^2} - 2\left(-\frac{1}{a^5c^2\sqrt{c+a^2cx^2}\,\mathrm{t}}\right.$$

$$= -\frac{1}{a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}dx}{a^4c^2} - 2\left(-\frac{1}{a^5c^2\sqrt{c+a^2cx^2}\,\mathrm{t}}\right.$$

$$= -\frac{1}{a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - 2\left(-\frac{1}{a^5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\mathrm{Si}}{a^5c^2\sqrt{c-}}\right.$$

$$= -\frac{1}{a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - 2\left(-\frac{1}{a^5c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\mathrm{Si}}{a^5c^2\sqrt{c-}}\right.$$

$$= -\frac{1}{a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3\sqrt{1+a^2x^2}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4a^5c^2\sqrt{c+a^2cx^2}} - 2\left(-\frac{}{a^5c^2\sqrt{c+a^2c}}\right.$$

Mathematica [A] time = 11.67, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
[Out] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^4}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^4/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.05, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c\, x^2+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
[Out] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c x^2+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(x^4/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^4/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c \left(a^2 x^2+1\right)\right)^{\frac{5}{2}} \operatorname{atan}^2\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
[Out] Integral(x**4/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.589 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=118

$$-\frac{x^3}{ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}+\frac{3\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{a^2x^2+1}\,\text{Ci}\left(3\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -x^3/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)+3/4*Ci(arctan(a*x))*(a^2*x^2+1)^(1
/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-3/4*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^4
/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.40, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4942, 4971, 4970, 4406, 3302}

$$\frac{3\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(3\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{a^2cx^2+c}}-\frac{x^3}{ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(x^3/(a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])) + (3*Sqrt[1 + a^2*x^2]*CosIn
tegral[ArcTan[a*x]])/(4*a^4*c^2*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[1 + a^2*x^2]
*CosIntegral[3*ArcTan[a*x]])/(4*a^4*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\frac{x^3}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{3\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{a}$$

$$= -\frac{x^3}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\left(3\sqrt{1+a^2x^2}\right)\int \frac{x^2}{\left(1+a^2x^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{ac^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{x^3}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{x}\,dx,x,\tan\right.}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{x^3}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \left(\frac{\cos(x)}{4x}-\frac{\cos(3x)}{4x}\right)dx,\right.}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{x^3}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\cos(x)}{x}\,dx,x,\tan^{-1}(ax\right.}{4a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{x^3}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{3\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{c+a^2cx^2}}-\frac{3\sqrt{1+a^2x^2}\,\text{Ci}}{4a^4c^2\sqrt{c}}$$

Mathematica [A] time = 0.23, size = 82, normalized size = 0.69

$$\frac{3c\sqrt{a^2x^2+1}\left(\text{Ci}\left(\tan^{-1}(ax)\right)-\text{Ci}\left(3\tan^{-1}(ax)\right)\right)-\frac{4a^3cx^3}{\left(a^2x^2+1\right)\tan^{-1}(ax)}}{4a^4c^3\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] ((-4*a^3*c*x^3)/((1 + a^2*x^2)*ArcTan[a*x]) + 3*c*Sqrt[1 + a^2*x^2]*(CosInt
egral[ArcTan[a*x]] - CosIntegral[3*ArcTan[a*x]]))/(4*a^4*c^3*Sqrt[c + a^2*c
*x^2])
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 3.06, size = 582, normalized size = 4.93

$$\frac{\left(3\,\mathrm{Ei}\left(1,-3i\arctan\left(ax\right)\right)\arctan\left(ax\right)x^{4}a^{4}+6\,\mathrm{Ei}\left(1,-3i\arctan\left(ax\right)\right)\arctan\left(ax\right)x^{2}a^{2}-\sqrt{a^{2}x^{2}+1}\;x^{3}a^{3}+3i\sqrt{a^{2}x^{2}}\right.}{8\sqrt{a^{2}x^{2}+1}\;\left(a^{4}x^{4}+2a^{2}x^{2}+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

```
[Out] 1/8*(3*Ei(1,-3*I*arctan(a*x))*arctan(a*x)*x^4*a^4+6*Ei(1,-3*I*arctan(a*x))*
arctan(a*x)*x^2*a^2-(a^2*x^2+1)^(1/2)*x^3*a^3+3*I*(a^2*x^2+1)^(1/2)*x^2*a^2
+3*Ei(1,-3*I*arctan(a*x))*arctan(a*x)+3*(a^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)
^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*x^4+2*a^2*x^2+1)/a
rctan(a*x)/c^3/a^4+1/8*(3*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^4*a^4-(a^2*x^
2+1)^(1/2)*x^3*a^3+6*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^2*a^2-3*I*(a^2*x^2
+1)^(1/2)*x^2*a^2+3*(a^2*x^2+1)^(1/2)*x*a+3*Ei(1,3*I*arctan(a*x))*arctan(a*
x)+I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*x^
4+2*a^2*x^2+1)/arctan(a*x)/c^3/a^4-3/8*(Ei(1,I*arctan(a*x))*arctan(a*x)*x^2
*a^2+Ei(1,I*arctan(a*x))*arctan(a*x)+(a^2*x^2+1)^(1/2)*x*a+I*(a^2*x^2+1)^(1
/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)/c^3/a^4-3/8*(a
rctan(a*x)*Ei(1,-I*arctan(a*x))*x^2*a^2+Ei(1,-I*arctan(a*x))*arctan(a*x)+(a
^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*
x))^(1/2)/arctan(a*x)/c^3/a^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3}}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^3/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^{3}}{\mathrm{atan}\left(a\,x\right)^{2}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^3/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}} \operatorname{atan}^2(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
```

```
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.590 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=142

$$-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}-\frac{1}{a^3c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}+\frac{1}{a^3c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

```
[Out] 1/a^3/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)-1/a^3/c^2/arctan(a*x)/(a^2*c*x^2+c)
^(1/2)-1/4*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)+3/
4*Si(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.58, antiderivative size = 142, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4964, 4902, 4971, 4970, 3299, 4406}

$$-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4a^3c^2\sqrt{a^2cx^2+c}}-\frac{1}{a^3c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}+\frac{1}{a^3c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] 1/(a^3*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) - 1/(a^3*c^2*Sqrt[c + a^2*c*x^2
]*ArcTan[a*x]) - (Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(4*a^3*c^2*Sq
rt[c + a^2*c*x^2]) + (3*Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/(4*a^
3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx}{a^2} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{a^2c}$$

$$= \frac{1}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{1}{a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} + \frac{3\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\text{ta}}}{a}$$

$$= \frac{1}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{1}{a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\int \frac{}{(1-}}{ac^2\sqrt{c}}$$

$$= \frac{1}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{1}{a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Subs}}{a^3}$$

$$= \frac{1}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{1}{a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\text{ta}\right.}{a^3c^2\sqrt{c+a}}$$

$$= \frac{1}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{1}{a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\text{ta}\right.}{a^3c^2\sqrt{c+a}}$$

$$= \frac{1}{a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{1}{a^3c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\text{ta}\right.}{4a^3c^2\sqrt{c+a}}$$

Mathematica [A] time = 0.29, size = 99, normalized size = 0.70

$$-\frac{\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)\text{Si}\left(\tan^{-1}(ax)\right)-3\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)\text{Si}\left(3\tan^{-1}(ax)\right)+4a^2x^2}{4a^3c^2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -1/4*(4*a^2*x^2 + (1 + a^2*x^2)^(3/2)*ArcTan[a*x]*SinIntegral[ArcTan[a*x]]
- 3*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]*SinIntegral[3*ArcTan[a*x]])/(a^3*c^2*(1
 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 4.13, size = 586, normalized size = 4.13

$$-\frac{i\left(3\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)x^4a^4-\sqrt{a^2x^2+1}\;x^3a^3+6\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)x^2a^2-3i\sqrt{a^2x^2}\right.}{8\sqrt{a^2x^2+1}\;\left(a^4x^4+2a^2x^2+1\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

```
[Out] -1/8*I*(3*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^4*a^4-(a^2*x^2+1)^(1/2)*x^3*a
^3+6*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^2*a^2-3*I*(a^2*x^2+1)^(1/2)*x^2*a^
2+3*(a^2*x^2+1)^(1/2)*x*a+3*Ei(1,3*I*arctan(a*x))*arctan(a*x)+I*(a^2*x^2+1)
^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*x^4+2*a^2*x^2+1)/a
rctan(a*x)/c^3/a^3+1/8*I*(3*Ei(1,-3*I*arctan(a*x))*arctan(a*x)*x^4*a^4+6*Ei
(1,-3*I*arctan(a*x))*arctan(a*x)*x^2*a^2-(a^2*x^2+1)^(1/2)*x^3*a^3+3*I*(a^2
*x^2+1)^(1/2)*x^2*a^2+3*Ei(1,-3*I*arctan(a*x))*arctan(a*x)+3*(a^2*x^2+1)^(1
/2)*x*a-I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a
^4*x^4+2*a^2*x^2+1)/arctan(a*x)/c^3/a^3+1/8*I*(Ei(1,I*arctan(a*x))*arctan(a
*x)*x^2*a^2+Ei(1,I*arctan(a*x))*arctan(a*x)+(a^2*x^2+1)^(1/2)*x*a+I*(a^2*x^
2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)/c^3/a^3
-1/8*I*(arctan(a*x)*Ei(1,-I*arctan(a*x))*x^2*a^2+Ei(1,-I*arctan(a*x))*arcta
n(a*x)+(a^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x
-I)*(I+a*x))^(1/2)/arctan(a*x)/c^3/a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(x^2/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^2(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
```

```
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.591 $\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=116

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(3\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}-\frac{x}{ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

```
[Out] -x/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)+1/4*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2
)/a^2/c^2/(a^2*c*x^2+c)^(1/2)+3/4*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^2/c
^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.50, antiderivative size = 116, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4968, 4971, 4970, 4406, 3302, 4905, 4904, 3312}

$$\frac{\sqrt{a^2x^2+1}\,\mathrm{CosIntegral}\left(\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{a^2x^2+1}\,\mathrm{CosIntegral}\left(3\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{a^2cx^2+c}}-\frac{x}{ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(x/(a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])) + (Sqrt[1 + a^2*x^2]*CosIntegr
al[ArcTan[a*x]])/(4*a^2*c^2*Sqrt[c + a^2*c*x^2]) + (3*Sqrt[1 + a^2*x^2]*Cos
Integral[3*ArcTan[a*x]])/(4*a^2*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
```

```
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\frac{x}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{a} - (2a)\int \frac{}{\left(c+a^2cx^2\right.}$$

$$= -\frac{x}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{ac^2\sqrt{c+a^2cx^2}} - \frac{\left(2a\sqrt{1-\right.}{}$$

$$= -\frac{x}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos^3(x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{x}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{3\cos(x)}{4x}+\frac{\cos(3x)}{4x}\right)dx, x,\right.}{a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{x}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(3x)}{x}\,dx, x, \tan^{-1}(ax)\right)}{4a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{x}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{4a^2c^2\sqrt{c+a^2cx^2}} + \frac{3\sqrt{1+a^2x^2}\,\text{Ci}\left(\right.}{4a^2c^2\sqrt{c+}}$$

Mathematica [A] time = 0.20, size = 95, normalized size = 0.82

$$\frac{\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)\text{Ci}\left(\tan^{-1}(ax)\right)+3\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)\text{Ci}\left(3\tan^{-1}(ax)\right)-4ax}{4a^2c^2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] (-4*a*x + (1 + a^2*x^2)^(3/2)*ArcTan[a*x]*CosIntegral[ArcTan[a*x]] + 3*(1 +
 a^2*x^2)^(3/2)*ArcTan[a*x]*CosIntegral[3*ArcTan[a*x]])/(4*a^2*c^2*(1 + a^2
*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x])
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^
2 + c^3)*arctan(a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 1.22, size = 601, normalized size = 5.18

$$-\frac{\left(\arctan\left(ax\right)\mathrm{Ei}\left(1,-i\arctan\left(ax\right)\right)x^2a^2+\mathrm{Ei}\left(1,-i\arctan\left(ax\right)\right)\arctan\left(ax\right)+\sqrt{a^2x^2+1}\,xa-i\sqrt{a^2x^2+1}\right)\sqrt{a^2x^2}}{8\arctan\left(ax\right)\left(a^4x^4+2a^2x^2+1\right)c^3a^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

```
[Out] -1/8*(arctan(a*x)*Ei(1,-I*arctan(a*x))*x^2*a^2+Ei(1,-I*arctan(a*x))*arctan(
a*x)+(a^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)^(1/2))*(a^2*x^2+1)^(1/2)*(c*(a*x-I
)*(I+a*x))^(1/2)/arctan(a*x)/(a^4*x^4+2*a^2*x^2+1)/c^3/a^2-1/8*(3*Ei(1,-3*I
*arctan(a*x))*arctan(a*x)*x^4*a^4+6*Ei(1,-3*I*arctan(a*x))*arctan(a*x)*x^2*
a^2-(a^2*x^2+1)^(1/2)*x^3*a^3+3*I*(a^2*x^2+1)^(1/2)*x^2*a^2+3*Ei(1,-3*I*arc
tan(a*x))*arctan(a*x)+3*(a^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)^(1/2))/(a^2*x^2
+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^2/c^3/(a^4*x^4+2*a^2*x^2+1)/arctan(a*
x)-1/8*(3*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^4*a^4-(a^2*x^2+1)^(1/2)*x^3*a
^3+6*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^2*a^2-3*I*(a^2*x^2+1)^(1/2)*x^2*a^
2+3*(a^2*x^2+1)^(1/2)*x*a+3*Ei(1,3*I*arctan(a*x))*arctan(a*x)+I*(a^2*x^2+1)
^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^2/c^3/(a^4*x^4+2*a^2*
x^2+1)/arctan(a*x)-1/8*(Ei(1,I*arctan(a*x))*arctan(a*x)*x^2*a^2+Ei(1,I*arct
an(a*x))*arctan(a*x)+(a^2*x^2+1)^(1/2)*x*a+I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)
^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)/c^3/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(x/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\operatorname{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
[Out] Integral(x/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.592 $\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=115

$$-\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}-\frac{1}{ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

```
[Out] -1/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)-3/4*Si(arctan(a*x))*(a^2*x^2+1)^(1/2
)/a/c^2/(a^2*c*x^2+c)^(1/2)-3/4*Si(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a/c^2/(
a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.24, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4902, 4971, 4970, 4406, 3299}

$$-\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4ac^2\sqrt{a^2cx^2+c}}-\frac{1}{ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(1/(a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])) - (3*Sqrt[1 + a^2*x^2]*SinInte
gral[ArcTan[a*x]])/(4*a*c^2*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[1 + a^2*x^2]*Sin
Integral[3*ArcTan[a*x]])/(4*a*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
```

```
Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\frac{1}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-(3a)\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx$$
$$= -\frac{1}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{\left(3a\sqrt{1+a^2x^2}\right)\int \frac{x}{\left(1+a^2x^2\right)^{5/2}\tan^{-1}(ax)}\,dx}{c^2\sqrt{c+a^2cx^2}}$$
$$= -\frac{1}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{x}\,dx,x,\tan\right.}{ac^2\sqrt{c+a^2cx^2}}$$
$$= -\frac{1}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int\left(\frac{\sin(x)}{4x}+\frac{\sin(3x)}{4x}\right)dx,\right.}{ac^2\sqrt{c+a^2cx^2}}$$
$$= -\frac{1}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\sin(x)}{x}\,dx,x,\tan^{-1}(ax\right.}{4ac^2\sqrt{c+a^2cx^2}}$$
$$= -\frac{1}{ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{3\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{4ac^2\sqrt{c+a^2cx^2}}-\frac{3\sqrt{1+a^2x^2}\,\text{Si}\left(\right.}{4ac^2\sqrt{c+}}$$

Mathematica [A] time = 0.12, size = 84, normalized size = 0.73

$$-\frac{\sqrt{c\left(a^2x^2+1\right)}\left(\frac{4}{\left(a^2x^2+1\right)^{3/2}}+3\tan^{-1}(ax)\text{Si}\left(\tan^{-1}(ax)\right)+3\tan^{-1}(ax)\text{Si}\left(3\tan^{-1}(ax)\right)\right)}{4ac^3\sqrt{a^2x^2+1}\,\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -1/4*(Sqrt[c*(1 + a^2*x^2)]*(4/(1 + a^2*x^2)^(3/2) + 3*ArcTan[a*x]*SinInteg
ral[ArcTan[a*x]] + 3*ArcTan[a*x]*SinIntegral[3*ArcTan[a*x]]))/(a*c^3*Sqrt[1
 + a^2*x^2]*ArcTan[a*x])
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2
+ c^3)*arctan(a*x)^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.77, size = 586, normalized size = 5.10

$$\frac{i\left(3\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)x^{4}a^{4}-\sqrt{a^{2}x^{2}+1}\;x^{3}a^{3}+6\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)x^{2}a^{2}-3i\sqrt{a^{2}x^{2}+\right.}{8\sqrt{a^{2}x^{2}+1}\;\left(a^{4}x^{4}+2a^{2}x^{2}+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

```
[Out] 1/8*I*(3*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^4*a^4-(a^2*x^2+1)^(1/2)*x^3*a^
3+6*Ei(1,3*I*arctan(a*x))*arctan(a*x)*x^2*a^2-3*I*(a^2*x^2+1)^(1/2)*x^2*a^2
+3*(a^2*x^2+1)^(1/2)*x*a+3*Ei(1,3*I*arctan(a*x))*arctan(a*x)+I*(a^2*x^2+1)^
(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*x^4+2*a^2*x^2+1)/ar
ctan(a*x)/a/c^3-1/8*I*(3*Ei(1,-3*I*arctan(a*x))*arctan(a*x)*x^4*a^4+6*Ei(1,
-3*I*arctan(a*x))*arctan(a*x)*x^2*a^2-(a^2*x^2+1)^(1/2)*x^3*a^3+3*I*(a^2*x^
2+1)^(1/2)*x^2*a^2+3*Ei(1,-3*I*arctan(a*x))*arctan(a*x)+3*(a^2*x^2+1)^(1/2)
*x*a-I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*
x^4+2*a^2*x^2+1)/arctan(a*x)/a/c^3+3/8*I*(Ei(1,I*arctan(a*x))*arctan(a*x)*x
^2*a^2+Ei(1,I*arctan(a*x))*arctan(a*x)+(a^2*x^2+1)^(1/2)*x*a+I*(a^2*x^2+1)^
(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)/a/c^3-3/8*I*
(arctan(a*x)*Ei(1,-I*arctan(a*x))*x^2*a^2+Ei(1,-I*arctan(a*x))*arctan(a*x)+
(a^2*x^2+1)^(1/2)*x*a-I*(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+
a*x))^(1/2)/arctan(a*x)/a/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{2}\,\left(c\,a^{2}\,x^{2}+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^{2}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.593 $\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=199

$$-\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)},x\right)}{ac^2}-\frac{\sqrt{a^2cx^2+c}}{ac^3x\tan^{-1}(ax)}-\frac{5\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{4c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{a^2x^2+1}\,\text{Ci}\left(3\tan^{-1}(ax)\right)}{4c^2\sqrt{a^2cx^2+c}}+\frac{}{c^2\sqrt{a}}$$

```
[Out] a*x/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)+a*x/c^2/arctan(a*x)/(a^2*c*x^2+c)^(1/
2)-5/4*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-3/4*Ci(3*a
rctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-(a^2*c*x^2+c)^(1/2)/a
/c^3/x/arctan(a*x)-Unintegrable(1/x^2/arctan(a*x)/(a^2*c*x^2+c)^(1/2),x)/a/
c^2
```

Rubi [A] time = 1.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] (a*x)/(c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) + (a*x)/(c^2*Sqrt[c + a^2*c*x^2
]*ArcTan[a*x]) - Sqrt[c + a^2*c*x^2]/(a*c^3*x*ArcTan[a*x]) - (5*Sqrt[1 + a^
2*x^2]*CosIntegral[ArcTan[a*x]])/(4*c^2*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[1 +
a^2*x^2]*CosIntegral[3*ArcTan[a*x]])/(4*c^2*Sqrt[c + a^2*c*x^2]) - Defer[In
t][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x]/(a*c^2)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx\right) + \frac{\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{c}$$

$$= \frac{ax}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - a\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx + \left(2a^3\right)\int \frac{}{\left(c+\right.}$$

$$= \frac{ax}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{ax}{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{c+a^2cx^2}}{ac^3x\tan^{-1}(ax)} - \frac{\int}{}$$

$$= \frac{ax}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{ax}{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{c+a^2cx^2}}{ac^3x\tan^{-1}(ax)} - \frac{\int}{}$$

$$= \frac{ax}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{ax}{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{c+a^2cx^2}}{ac^3x\tan^{-1}(ax)} - \frac{\int}{}$$

$$= \frac{ax}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{ax}{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{c+a^2cx^2}}{ac^3x\tan^{-1}(ax)} - \frac{\sqrt{1}}{}$$

$$= \frac{ax}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{ax}{c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{c+a^2cx^2}}{ac^3x\tan^{-1}(ax)} - \frac{5\sqrt{}}{}$$

Mathematica [A] time = 2.47, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3
+ c^3*x)*arctan(a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
[Out] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}x\arctan\left(ax\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{2}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(1/(x*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^{2}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.594 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=164

$$\frac{\operatorname{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2},x\right)}{c^2}+\frac{7a\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{4c^2\sqrt{a^2cx^2+c}}+\frac{3a\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{4c^2\sqrt{a^2cx^2+c}}+\frac{a}{c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

```
[Out] a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)+a/c^2/arctan(a*x)/(a^2*c*x^2+c)^(1/2)+7
/4*a*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+3/4*a*Si(3*a
rctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+Unintegrable(1/x^2/ar
ctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/c^2
```

Rubi [A] time = 0.80, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] a/(c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) + a/(c^2*Sqrt[c + a^2*c*x^2]*ArcTan
[a*x]) + (7*a*Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(4*c^2*Sqrt[c + a
^2*c*x^2]) + (3*a*Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/(4*c^2*Sqrt
[c + a^2*c*x^2]) + Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
/c^2
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\left(a^2\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx\right) + \frac{\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{c}$$

$$= \frac{a}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \left(3a^3\right)\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx + \frac{\int \frac{}{x^2\sqrt{}}}{}$$

$$= \frac{a}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{a}{c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)} + \frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(}}{c^2}$$

$$= \frac{a}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{a}{c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)} + \frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(}}{c^2}$$

$$= \frac{a}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{a}{c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)} + \frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(}}{c^2}$$

$$= \frac{a}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{a}{c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)} + \frac{a\sqrt{1+a^2x^2}\,\mathrm{Si}\left(\mathrm{ta}\right.}{c^2\sqrt{c+a^2c}}$$

$$= \frac{a}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{a}{c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)} + \frac{7a\sqrt{1+a^2x^2}\,\mathrm{Si}\left(\mathrm{t}\right.}{4c^2\sqrt{c+a^2}}$$

Mathematica [A] time = 4.40, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2\right)\arctan\left(ax\right)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4
+ c^3*x^2)*arctan(a*x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(a^2 c\, x^2 + c\right)^{\frac{5}{2}} \arctan\left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
[Out] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2 c x^2 + c\right)^{\frac{5}{2}} x^2 \arctan\left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x^2*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\, \mathrm{atan}\left(a\, x\right)^2 \left(c\, a^2\, x^2 + c\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(1/(x^2*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(c \left(a^2 x^2 + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^2\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
[Out] Integral(1/(x**2*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.595 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=238

$$\frac{2a\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)},x\right)}{c^2}+\frac{\text{Int}\left(\frac{1}{x^3\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{c^2}+\frac{2a\sqrt{a^2cx^2+c}}{c^3x\tan^{-1}(ax)}+\frac{9a^2\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{4c^2\sqrt{a^2cx^2+c}}+\frac{3a^2}{}$$

```
[Out] -a^3*x/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)-2*a^3*x/c^2/arctan(a*x)/(a^2*c*x^2
+c)^(1/2)+9/4*a^2*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)
+3/4*a^2*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+2*a*(a
^2*c*x^2+c)^(1/2)/c^3/x/arctan(a*x)+Unintegrable(1/x^3/arctan(a*x)^2/(a^2*c
*x^2+c)^(1/2),x)/c^2+2*a*Unintegrable(1/x^2/arctan(a*x)/(a^2*c*x^2+c)^(1/2)
,x)/c^2
```

Rubi [A] time = 2.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -((a^3*x)/(c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])) - (2*a^3*x)/(c^2*Sqrt[c +
a^2*c*x^2]*ArcTan[a*x]) + (2*a*Sqrt[c + a^2*c*x^2])/(c^3*x*ArcTan[a*x]) + (
9*a^2*Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(4*c^2*Sqrt[c + a^2*c*x^2
]) + (3*a^2*Sqrt[1 + a^2*x^2]*CosIntegral[3*ArcTan[a*x]])/(4*c^2*Sqrt[c + a
^2*c*x^2]) + Defer[Int][1/(x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]/c^2 +
 (2*a*Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]), x])/c^2
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx = -\left(a^2\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx\right)+\frac{\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{c}$$

$$= a^4\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c^2}-2\frac{a^2\int \frac{}{x(c+a^2c}}{}$$

$$= -\frac{a^3x}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+a^3\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)}\,dx-\left(2a^5\right)\int$$

$$= -\frac{a^3x}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c^2}-2\left(\frac{a^3x}{c^2\sqrt{c+a^2cx^2}\,\mathrm{ta}}\right.$$

$$= -\frac{a^3x}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c^2}+\frac{\left(a^2\sqrt{1+a^2x^2}\right)\mathrm{Sul}}{c^2}$$

$$= -\frac{a^3x}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c^2}-2\left(\frac{a^3x}{c^2\sqrt{c+a^2cx^2}\,\mathrm{ta}}\right.$$

$$= -\frac{a^3x}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{c^2}-2\left(\frac{a^3x}{c^2\sqrt{c+a^2cx^2}\,\mathrm{ta}}\right.$$

$$= -\frac{a^3x}{c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}+\frac{a^2\sqrt{1+a^2x^2}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{4c^2\sqrt{c+a^2cx^2}}+\frac{3a^2\sqrt{1+a^2x^2}\,\mathrm{C}}{4c^2\sqrt{c}}$$

Mathematica [A] time = 7.95, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^9+3\,a^4c^3x^7+3\,a^2c^3x^5+c^3x^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^9 + 3*a^4*c^3*x^7 + 3*a^2*c^3*x^5
+ c^3*x^3)*arctan(a*x)^2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.97, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}} x^{3} \arctan\left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x^3*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^3\,\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x^3*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(x**3*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.596 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=209

$$-\frac{2a^2\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2},x\right)}{c^2}+\frac{\text{Int}\left(\frac{1}{x^4\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2},x\right)}{c^2}-\frac{11a^3\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{4c^2\sqrt{a^2cx^2+c}}-\frac{3a^3\sqrt{a^2x^2+1}\,\text{Si}\left(3\right.}{4c^2\sqrt{a^2cx^2\cdot}}$$

```
[Out] -a^3/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)-2*a^3/c^2/arctan(a*x)/(a^2*c*x^2+c)^
(1/2)-11/4*a^3*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-3/
4*a^3*Si(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+Unintegra
ble(1/x^4/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/c^2-2*a^2*Unintegrable(1/x^2
/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)/c^2
```

Rubi [A] time = 1.61, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] -(a^3/(c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])) - (2*a^3)/(c^2*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x]) - (11*a^3*Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(4*
c^2*Sqrt[c + a^2*c*x^2]) - (3*a^3*Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*
x]])/(4*c^2*Sqrt[c + a^2*c*x^2]) + Defer[Int][1/(x^4*Sqrt[c + a^2*c*x^2]*Ar
cTan[a*x]^2), x]/c^2 - (2*a^2*Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[
a*x]^2), x])/c^2
```

Rubi steps

$$\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^2} \, dx = -\left(a^2 \int \frac{1}{x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^2} \, dx\right) + \frac{\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^2} \, dx}{c}$$

$$= a^4 \int \frac{1}{\left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^2} \, dx + \frac{\int \frac{1}{x^4 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^2} \, dx}{c^2} - 2 \frac{a^2 \int \frac{}{x^2 (c}}{}$$

$$= -\frac{a^3}{c \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)} - \left(3a^5\right) \int \frac{x}{\left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)} \, dx + \frac{\int \frac{}{x^4}}{}$$

$$= -\frac{a^3}{c \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)} + \frac{\int \frac{1}{x^4 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^2} \, dx}{c^2} - 2 \left(\frac{a^3}{c^2 \sqrt{c+a^2 c x^2}} \right.$$

$$= -\frac{a^3}{c \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)} + \frac{\int \frac{1}{x^4 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^2} \, dx}{c^2} - \frac{\left(3a^3 \sqrt{1+a^2 x^2}\right)}{}$$

$$= -\frac{a^3}{c \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)} + \frac{\int \frac{1}{x^4 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^2} \, dx}{c^2} - 2 \left(\frac{a^3}{c^2 \sqrt{c+a^2 c x^2}} \right.$$

$$= -\frac{a^3}{c \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)} + \frac{\int \frac{1}{x^4 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^2} \, dx}{c^2} - 2 \left(\frac{a^3}{c^2 \sqrt{c+a^2 c x^2}} \right.$$

$$= -\frac{a^3}{c \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)} - \frac{3a^3 \sqrt{1+a^2 x^2} \operatorname{Si}\left(\tan^{-1}(ax)\right)}{4c^2 \sqrt{c+a^2 c x^2}} - \frac{3a^3 \sqrt{1+a^2}}{4c^2}$$

Mathematica [A] time = 7.48, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{\sqrt{a^2 c x^2 + c}}{\left(a^6 c^3 x^{10} + 3\, a^4 c^3 x^8 + 3\, a^2 c^3 x^6 + c^3 x^4\right) \arctan(ax)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^10 + 3*a^4*c^3*x^8 + 3*a^2*c^3*x^6
 + c^3*x^4)*arctan(a*x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.88, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c\,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{{\left(a^{2} c x^{2} + c\right)}^{\frac{5}{2}} x^{4} \arctan \left(a x\right)^{2}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x^4*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)
```

```
[Out] Integral(1/(x**4*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**2), x)
```

3.597 $\int \frac{\sqrt{fx}}{(d+c^2dx^2)^2 (a+b\tan^{-1}(cx))^2} dx$

Optimal. Leaf size=33

$$\text{Int}\left(\frac{\sqrt{fx}}{(c^2dx^2+d)^2 (a+b\tan^{-1}(cx))^2}, x\right)$$

```
[Out] Unintegrable((f*x)^(1/2)/(c^2*d*x^2+d)^2/(a+b*arctan(c*x))^2,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{fx}}{(d+c^2dx^2)^2 (a+b\tan^{-1}(cx))^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[f*x]/((d + c^2*d*x^2)^2*(a + b*ArcTan[c*x])^2),x]
```

```
[Out] Defer[Int][Sqrt[f*x]/((d + c^2*d*x^2)^2*(a + b*ArcTan[c*x])^2), x]
```

Rubi steps

$$\int \frac{\sqrt{fx}}{(d+c^2dx^2)^2 (a+b\tan^{-1}(cx))^2} dx = \int \frac{\sqrt{fx}}{(d+c^2dx^2)^2 (a+b\tan^{-1}(cx))^2} dx$$

Mathematica [A] time = 31.57, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{fx}}{(d+c^2dx^2)^2 (a+b\tan^{-1}(cx))^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[f*x]/((d + c^2*d*x^2)^2*(a + b*ArcTan[c*x])^2),x]
```

```
[Out] Integrate[Sqrt[f*x]/((d + c^2*d*x^2)^2*(a + b*ArcTan[c*x])^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{fx}}{a^2c^4d^2x^4 + 2a^2c^2d^2x^2 + a^2d^2 + (b^2c^4d^2x^4 + 2b^2c^2d^2x^2 + b^2d^2)\arctan(cx)^2 + 2(abc^4d^2x^4 + 2abc^2d\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(1/2)/(c^2*d*x^2+d)^2/(a+b*arctan(c*x))^2,x, algorithm="fri
cas")
```

```
[Out] integral(sqrt(f*x)/(a^2*c^4*d^2*x^4 + 2*a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^
4*d^2*x^4 + 2*b^2*c^2*d^2*x^2 + b^2*d^2)*arctan(c*x)^2 + 2*(a*b*c^4*d^2*x^4
 + 2*a*b*c^2*d^2*x^2 + a*b*d^2)*arctan(c*x)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(1/2)/(c^2*d*x^2+d)^2/(a+b*arctan(c*x))^2,x, algorithm="gia
c")
```

```
[Out] Timed out
```

maple [A] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{fx}}{\left(c^{2} d \,x^{2}+d \right)^{2} \left(a +b \arctan \left(c x \right)\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(1/2)/(c^2*d*x^2+d)^2/(a+b*arctan(c*x))^2,x)
```

```
[Out] int((f*x)^(1/2)/(c^2*d*x^2+d)^2/(a+b*arctan(c*x))^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\frac{1}{2}\left(a^{2} c^{2} d^{2} x^{2}+a^{2} d^{2}+\left(b^{2} c^{2} d^{2} x^{2}+b^{2} d^{2}\right) \arctan \left(c x\right)^{2}+2\left(a b c^{2} d^{2} x^{2}+a b d^{2}\right) \arctan \left(c x\right)\right) \sqrt{f} \int \frac{\cdots}{a^{3} c^{4} d^{2} x^{4}+2 a^{3} c^{2} d^{2} x^{2}+a^{3} \cdots}}{2\left(a^{2} c^{2} d^{2} x^{2}+a^{2} d^{2}+\left(b^{2} c^{2} d^{2} x^{2}+b^{2} d^{2}\right) \mathrm{ar}\cdots\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^(1/2)/(c^2*d*x^2+d)^2/(a+b*arctan(c*x))^2,x, algorithm="max
ima")
```

```
[Out] 1/2*(2*(a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^2*d^2*x^2 + b^2*d^2)*arctan(c*x)
^2 + 2*(a*b*c^2*d^2*x^2 + a*b*d^2)*arctan(c*x))*sqrt(f)*integrate(1/4*(a*c^
2*x^2 + 4*b*c*x + (b*c^2*x^2 + b)*arctan(c*x) + a)*sqrt(x)/(a^3*c^4*d^2*x^4
 + 2*a^3*c^2*d^2*x^2 + a^3*d^2 + (b^3*c^4*d^2*x^4 + 2*b^3*c^2*d^2*x^2 + b^3
*d^2)*arctan(c*x)^3 + 3*(a*b^2*c^4*d^2*x^4 + 2*a*b^2*c^2*d^2*x^2 + a*b^2*d^
2)*arctan(c*x)^2 + 3*(a^2*b*c^4*d^2*x^4 + 2*a^2*b*c^2*d^2*x^2 + a^2*b*d^2)*
arctan(c*x)), x) + sqrt(f)*x^(3/2))/(a^2*c^2*d^2*x^2 + a^2*d^2 + (b^2*c^2*d
^2*x^2 + b^2*d^2)*arctan(c*x)^2 + 2*(a*b*c^2*d^2*x^2 + a*b*d^2)*arctan(c*x)
)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{f\,x}}{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2\,{\left(d\,c^2\,x^2+d\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^(1/2)/((a + b*atan(c*x))^2*(d + c^2*d*x^2)^2),x)
```

```
[Out] int((f*x)^(1/2)/((a + b*atan(c*x))^2*(d + c^2*d*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**(1/2)/(c**2*d*x**2+d)**2/(a+b*atan(c*x))**2,x)
```

```
[Out] Timed out
```

3.598 $\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2,x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2,x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m/arctan(a*x
)^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.66, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2 + c\right)^3}{\arctan\left(a x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
[Out] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^3}{\mathrm{atan}\left(a\, x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^2,x)
[Out] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3 \left(\int \frac{x^m}{\operatorname{atan}^2\left(a x\right)}\, dx + \int \frac{3 a^2 x^2 x^m}{\operatorname{atan}^2\left(a x\right)}\, dx + \int \frac{3 a^4 x^4 x^m}{\operatorname{atan}^2\left(a x\right)}\, dx + \int \frac{a^6 x^6 x^m}{\operatorname{atan}^2\left(a x\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3/atan(a*x)**2,x)
[Out] c**3*(Integral(x**m/atan(a*x)**2, x) + Integral(3*a**2*x**2*x**m/atan(a*x)*
*2, x) + Integral(3*a**4*x**4*x**m/atan(a*x)**2, x) + Integral(a**6*x**6*x*
*m/atan(a*x)**2, x))
```

3.599 $\int \frac{x^m(c+a^2cx^2)^2}{\tan^{-1}(ax)^2} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2,x]
```

```
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx = \int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 0.91, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2,x]
```

```
[Out] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)x^m}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m/arctan(a*x)^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.51, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c\, x^{2}+c \right)^{2}}{\arctan \left(a x \right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
[Out] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^2,x)
[Out] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x^{m}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x^{2} x^{m}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{4} x^{m}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2/atan(a*x)**2,x)
[Out] c**2*(Integral(x**m/atan(a*x)**2, x) + Integral(2*a**2*x**2*x**m/atan(a*x)*
*2, x) + Integral(a**4*x**4*x**m/atan(a*x)**2, x))
```

3.600 $\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^2,x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^2,x]
[Out] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)x^m}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m/arctan(a*x)^2, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.33, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)}{\arctan \left(a x \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^2,x)
[Out] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2))/atan(a*x)^2,x)
[Out] int((x^m*(c + a^2*c*x^2))/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x^{m}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{2} x^{m}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)/atan(a*x)**2,x)
[Out] c*(Integral(x**m/atan(a*x)**2, x) + Integral(a**2*x**2*x**m/atan(a*x)**2, x
))
```

3.601 $\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=41

$$\frac{m\text{Int}\left(\frac{x^{m-1}}{\tan^{-1}(ax)},x\right)}{ac}-\frac{x^m}{ac\tan^{-1}(ax)}$$

[Out] -x^m/a/c/arctan(a*x)+m*Unintegrable(x^(-1+m)/arctan(a*x),x)/a/c

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]

[Out] -(x^m/(a*c*ArcTan[a*x])) + (m*Defer[Int][x^(-1 + m)/ArcTan[a*x], x])/(a*c)

Rubi steps

$$\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx=-\frac{x^m}{ac\tan^{-1}(ax)}+\frac{m\int \frac{x^{-1+m}}{\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 0.55, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^2),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^2), x]

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{(a^2cx^2+c)\arctan(ax)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="fricas")

[Out] integral(x^m/((a^2*c*x^2 + c)*arctan(a*x)^2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 0.54, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^2,x)
[Out] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{msage_0 x \arctan \left(ax\right) - x^m}{ac \arctan \left(ax\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^2,x, algorithm="maxima")
[Out] (m*arctan(a*x)*integrate(x^m/(x*arctan(a*x)), x) - x^m)/(a*c*arctan(a*x))
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^2\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)),x)
[Out] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{2} x^{2} \operatorname{atan}^{2}{\left(a x \right)} + \operatorname{atan}^{2}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)/atan(a*x)**2,x)
[Out] Integral(x**m/(a**2*x**2*atan(a*x)**2 + atan(a*x)**2), x)/c
```

3.602 $\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^2 \tan^{-1}(ax)^2},x\right)$$

[Out] Unintegrable(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]

[Out] Defer[Int][x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^2), x]

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.68, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^2),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^2), x]

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="fricas")

[Out] integral(x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^2), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="giac")

[Out] Timed out

maple [A] time = 1.58, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c\, x^{2}+c\right)^{2} \arctan\left(a x\right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
[Out] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^2,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^2),x)
[Out] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{4} x^{4} \operatorname{atan}^{2}{\left(a x \right)} + 2 a^{2} x^{2} \operatorname{atan}^{2}{\left(a x \right)} + \operatorname{atan}^{2}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**2/atan(a*x)**2,x)
[Out] Integral(x**m/(a**4*x**4*atan(a*x)**2 + 2*a**2*x**2*atan(a*x)**2 + atan(a*x
)**2), x)/c**2
```

3.603 $\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} dx = \int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 0.70, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^2),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*
x)^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A]   time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
[Out] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^2,x)
```

maxima [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^2,x, algorithm="maxima")
[Out] Timed out
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^3),x)
[Out] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^3), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{6} x^{6} \operatorname{atan}^{2}{\left(a x \right)} + 3 a^{4} x^{4} \operatorname{atan}^{2}{\left(a x \right)} + 3 a^{2} x^{2} \operatorname{atan}^{2}{\left(a x \right)} + \operatorname{atan}^{2}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**3/atan(a*x)**2,x)
[Out] Integral(x**m/(a**6*x**6*atan(a*x)**2 + 3*a**4*x**4*atan(a*x)**2 + 3*a**2*x
**2*atan(a*x)**2 + atan(a*x)**2), x)/c**3
```

3.604 $\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2} dx$

Optimal. Leaf size=27

$$\operatorname{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2,x]
```

```
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2} dx = \int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 1.68, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2,x]
```

```
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m/arctan
(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c\,x^{2}+c \right)^{\frac{5}{2}}}{\arctan \left(a x \right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)

[Out] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(a^{2} c x^{2} + c\right)}^{\frac{5}{2}} x^{m}}{\arctan \left(a x\right)^{2}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^m/arctan(a*x)^2, x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^2,x)

[Out] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^2, x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)

[Out] Timed out

3.605 $\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2,x]
```

```
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 1.34, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2,x]
```

```
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^m}{\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2 + c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c x^2 + c\right)^{\frac{3}{2}} x^m}{\arctan\left(ax\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^{3/2}}{\mathrm{atan}\left(a\, x\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^2,x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
```

```
[Out] Timed out
```

3.606 $\int \frac{x^m \sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^2}, x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2,x]
[Out] Defer[Int][(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2, x]
```

Rubi steps

$$\int \frac{x^m \sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx = \int \frac{x^m \sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2,x]
[Out] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^2, x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\arctan(ax)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x)^2, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{a^{2} c\,x^{2}+c}}{\arctan \left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2}+c}\, x^{m}}{\arctan \left(a x\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x)^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^{m}\,\sqrt{c\,a^{2}\,x^{2}+c}}{{\mathrm{atan}\left(a\,x\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^2,x)
[Out] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}^{2}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)/atan(a*x)**2,x)
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))/atan(a*x)**2, x)
```

3.607 $\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\sqrt{a^2cx^2+c} \tan^{-1}(ax)^2}, x\right)$$

```
[Out] Unintegrable(x^m/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
[Out] Defer[Int][x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} dx = \int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} dx$$

Mathematica [A] time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2),x]
[Out] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\sqrt{a^2cx^2+c} \arctan(ax)^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.53, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\arctan(ax)^2 \sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{a^2 c x^2 + c}\, \arctan(ax)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\operatorname{atan}(a\, x)^2 \sqrt{c\, a^2\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c \left(a^2 x^2 + 1\right)}\, \operatorname{atan}^2(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/atan(a*x)**2/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**2), x)
```

3.608 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.76, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(a^2c\,x^2+c)^{\frac{3}{2}}\arctan(ax)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
[Out] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(a^2cx^2+c)^{\frac{3}{2}}\arctan(ax)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2,x, algorithm="maxima")
[Out] integrate(x^m/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}(a\,x)^2\,(c\,a^2\,x^2+c)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(c(a^2x^2+1))^{\frac{3}{2}}\,\mathrm{atan}^2(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(3/2)/atan(a*x)**2,x)
[Out] Integral(x**m/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**2), x)
```

3.609 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)^2},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Mathematica [A] time = 0.83, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2),x]
```

```
[Out] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)

[Out] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^2,x, algorithm="maxima")

[Out] integrate(x^m/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^2), x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)),x)

[Out] int(x^m/(atan(a*x)^2*(c + a^2*c*x^2)^(5/2)), x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m/(a**2*c*x**2+c)**(5/2)/atan(a*x)**2,x)

[Out] Timed out

3.610 $\int \frac{x(c+a^2cx^2)}{\tan^{-1}(ax)^3} dx$

Optimal. Leaf size=21

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)/arctan(a*x)^3,x)

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2))/ArcTan[a*x]^3,x]

[Out] Defer[Int][(x*(c + a^2*c*x^2))/ArcTan[a*x]^3, x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx=\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.18, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^3,x]

[Out] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^3, x]

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2cx^3+cx}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral((a^2*c*x^3 + c*x)/arctan(a*x)^3, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.70, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)}{\arctan\left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(x*(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{5} c x^{5}+2\,a^{3} c x^{3}-2\,a^{2} sage_{0} x \arctan\left(a x\right)^{2}+a c x+\left(5\,a^{6} c x^{6}+11\,a^{4} c x^{4}+7\,a^{2} c x^{2}+c\right) \arctan\left(a x\right)}{2\,a^{2} \arctan\left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^5*c*x^5 + 2*a^3*c*x^3 - 2*a^2*arctan(a*x)^2*integrate((15*a^4*c*x^5
 + 22*a^2*c*x^3 + 7*c*x)/arctan(a*x), x) + a*c*x + (5*a^6*c*x^6 + 11*a^4*c*
x^4 + 7*a^2*c*x^2 + c)*arctan(a*x))/(a^2*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{x\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2))/atan(a*x)^3,x)
```

```
[Out] int((x*(c + a^2*c*x^2))/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{3}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] c*(Integral(x/atan(a*x)**3, x) + Integral(a**2*x**3/atan(a*x)**3, x))
```

3.611 $\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=20

$$\operatorname{Int}\left(\frac{a^2cx^2+c}{\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)/arctan(a*x)^3,x)

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)/ArcTan[a*x]^3,x]

[Out] Defer[Int][(c + a^2*c*x^2)/ArcTan[a*x]^3, x]

Rubi steps

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^3}\,dx = \int \frac{c+a^2cx^2}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^3,x]

[Out] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^3, x]

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{a^2cx^2+c}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral((a^2*c*x^2 + c)/arctan(a*x)^3, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.46, size = 0, normalized size = 0.00

$$\int \frac{a^2c\,x^2+c}{\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int((a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^4cx^4 + 2\,a^2cx^2 - 4\,a\arctan(ax)^2\int\frac{5\,a^4cx^4+6\,a^2cx^2+c}{\arctan(ax)}\,dx + 4\left(a^5cx^5 + 2\,a^3cx^3 + acx\right)\arctan(ax) + c}{2\,a\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^4*c*x^4 + 2*a^2*c*x^2 - 2*a*arctan(a*x)^2*integrate(2*(5*a^4*c*x^4
+ 6*a^2*c*x^2 + c)/arctan(a*x), x) + 4*(a^5*c*x^5 + 2*a^3*c*x^3 + a*c*x)*ar
ctan(a*x) + c)/(a*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int\frac{c\,a^2\,x^2+c}{\mathrm{atan}\left(a\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/atan(a*x)^3,x)
```

```
[Out] int((c + a^2*c*x^2)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int\frac{a^2x^2}{\mathrm{atan}^3(ax)}\,dx + \int\frac{1}{\mathrm{atan}^3(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] c*(Integral(a**2*x**2/atan(a*x)**3, x) + Integral(atan(a*x)**(-3), x))
```

3.612 $\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{a^2cx^2+c}{x\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/x/arctan(a*x)^3,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/(x*ArcTan[a*x]^3),x]
[Out] Defer[Int][(c + a^2*c*x^2)/(x*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^3}\,dx = \int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^3),x]
[Out] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2cx^2+c}{x\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)/(x*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.32, size = 0, normalized size = 0.00

$$\int \frac{a^2c\,x^2+c}{x\arctan(ax)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/x/arctan(a*x)^3,x)
```

```
[Out] int((a^2*c*x^2+c)/x/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^5cx^5 + 2\,a^3cx^3 - 2\,sage_0x^3\arctan\left(ax\right)^2 + acx + \left(3\,a^6cx^6 + 5\,a^4cx^4 + a^2cx^2 - c\right)\arctan\left(ax\right)}{2\,a^2x^2\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^5*c*x^5 + 2*a^3*c*x^3 - 2*x^2*arctan(a*x)^2*integrate((6*a^6*c*x^6
+ 5*a^4*c*x^4 + c)/(x^3*arctan(a*x)), x) + a*c*x + (3*a^6*c*x^6 + 5*a^4*c*x
^4 + a^2*c*x^2 - c)*arctan(a*x))/(a^2*x^2*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{c\,a^2\,x^2+c}{x\,\mathrm{atan}\left(a\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/(x*atan(a*x)^3),x)
```

```
[Out] int((c + a^2*c*x^2)/(x*atan(a*x)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{1}{x\operatorname{atan}^{3}{\left(ax \right)}}\, dx + \int \frac{a^{2}x}{\operatorname{atan}^{3}{\left(ax \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/x/atan(a*x)**3,x)
```

```
[Out] c*(Integral(1/(x*atan(a*x)**3), x) + Integral(a**2*x/atan(a*x)**3, x))
```

3.613 $\int \frac{x(c+a^2cx^2)^2}{\tan^{-1}(ax)^3} dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3,x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx=\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.06, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3,x]
[Out] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^4c^2x^5+2\,a^2c^2x^3+c^2x}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)/arctan(a*x)^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.95, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c \,x^{2}+c\right)^{2}}{\arctan \left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{7} c^{2} x^{7}+3\,a^{5} c^{2} x^{5}+3\,a^{3} c^{2} x^{3}-4\,a^{2} \arctan \left(a x\right)^{2} \int \frac{14\,a^{6} c^{2} x^{7}+33\,a^{4} c^{2} x^{5}+24\,a^{2} c^{2} x^{3}+5\,c^{2} x}{\arctan\left(a x\right)}\,dx+a c^{2} x+\left(7\,a^{8} c^{2} x^{8}+22\,a^{6} c^{2}\right.}{2\,a^{2} \arctan \left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^7*c^2*x^7 + 3*a^5*c^2*x^5 + 3*a^3*c^2*x^3 - 2*a^2*arctan(a*x)^2*int
egrate(2*(14*a^6*c^2*x^7 + 33*a^4*c^2*x^5 + 24*a^2*c^2*x^3 + 5*c^2*x)/arcta
n(a*x), x) + a*c^2*x + (7*a^8*c^2*x^8 + 22*a^6*c^2*x^6 + 24*a^4*c^2*x^4 + 1
0*a^2*c^2*x^2 + c^2)*arctan(a*x))/(a^2*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^3,x)
```

```
[Out] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x^{3}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{5}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] c**2*(Integral(x/atan(a*x)**3, x) + Integral(2*a**2*x**3/atan(a*x)**3, x) +
 Integral(a**4*x**5/atan(a*x)**3, x))
```

3.614 $\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/ArcTan[a*x]^3,x]
[Out] Defer[Int][(c + a^2*c*x^2)^2/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^3,x]
[Out] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^4c^2x^4+2\,a^2c^2x^2+c^2}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)/arctan(a*x)^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.69, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{2}}{\arctan\left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] int((a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{6} c^{2} x^{6}+3\,a^{4} c^{2} x^{4}+3\,a^{2} c^{2} x^{2}-6\,a \arctan\left(a x\right)^{2} \int \frac{7\,a^{6} c^{2} x^{6}+15\,a^{4} c^{2} x^{4}+9\,a^{2} c^{2} x^{2}+c^{2}}{\arctan(ax)}\,dx+c^{2}+6\left(a^{7} c^{2} x^{7}+3\,a^{5} c^{2} x^{5}+3\,a^{3}\right.}{2\,a \arctan\left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^6*c^2*x^6 + 3*a^4*c^2*x^4 + 3*a^2*c^2*x^2 - 2*a*arctan(a*x)^2*integ
rate(3*(7*a^6*c^2*x^6 + 15*a^4*c^2*x^4 + 9*a^2*c^2*x^2 + c^2)/arctan(a*x),
x) + c^2 + 6*(a^7*c^2*x^7 + 3*a^5*c^2*x^5 + 3*a^3*c^2*x^3 + a*c^2*x)*arctan
(a*x))/(a*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{\left(c\,a^{2}\,x^{2}+c\right)^{2}}{\mathrm{atan}\left(a\,x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/atan(a*x)^3,x)
```

```
[Out] int((c + a^2*c*x^2)^2/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int \frac{2a^{2}x^{2}}{\operatorname{atan}^{3}\left(ax\right)}\,dx+\int \frac{a^{4}x^{4}}{\operatorname{atan}^{3}\left(ax\right)}\,dx+\int \frac{1}{\operatorname{atan}^{3}\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] c**2*(Integral(2*a**2*x**2/atan(a*x)**3, x) + Integral(a**4*x**4/atan(a*x)*
*3, x) + Integral(atan(a*x)**(-3), x))
```

3.615 $\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{x\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^2/x/arctan(a*x)^3,x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^3),x]

[Out] Defer[Int][(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^3), x]

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^3}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.34, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^3),x]

[Out] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^3), x]

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^4c^2x^4+2\,a^2c^2x^2+c^2}{x\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)/(x*arctan(a*x)^3), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^3,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.88, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{2}}{x \arctan \left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/x/arctan(a*x)^3,x)
```

```
[Out] int((a^2*c*x^2+c)^2/x/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{7} c^{2} x^{7} + 3\,a^{5} c^{2} x^{5} + 3\,a^{3} c^{2} x^{3} - 2\,sage_{0} x^{3} \arctan\left(ax\right)^{2} + ac^{2} x + \left(5\,a^{8} c^{2} x^{8} + 14\,a^{6} c^{2} x^{6} + 12\,a^{4} c^{2} x^{4} + 2\,a^{2} c^{2} x^{2} - c}{2\,a^{2} x^{2} \arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^7*c^2*x^7 + 3*a^5*c^2*x^5 + 3*a^3*c^2*x^3 - 2*x^2*arctan(a*x)^2*int
egrate((15*a^8*c^2*x^8 + 28*a^6*c^2*x^6 + 12*a^4*c^2*x^4 + c^2)/(x^3*arctan
(a*x)), x) + a*c^2*x + (5*a^8*c^2*x^8 + 14*a^6*c^2*x^6 + 12*a^4*c^2*x^4 + 2
*a^2*c^2*x^2 - c^2)*arctan(a*x))/(a^2*x^2*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\,a^2\,x^2+c\right)^2}{x\,\mathrm{atan}\left(a\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/(x*atan(a*x)^3),x)
```

```
[Out] int((c + a^2*c*x^2)^2/(x*atan(a*x)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{1}{x \operatorname{atan}^{3}{\left(ax \right)}}\, dx + \int \frac{2a^{2} x}{\operatorname{atan}^{3}{\left(ax \right)}}\, dx + \int \frac{a^{4} x^{3}}{\operatorname{atan}^{3}{\left(ax \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/x/atan(a*x)**3,x)
```

```
[Out] c**2*(Integral(1/(x*atan(a*x)**3), x) + Integral(2*a**2*x/atan(a*x)**3, x)
+ Integral(a**4*x**3/atan(a*x)**3, x))
```

3.616 $\int \frac{x(c+a^2cx^2)^3}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)^3/arctan(a*x)^3,x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3,x]

[Out] Defer[Int][(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3, x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx=\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3,x]

[Out] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3, x]

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x)/arctan(a*x)^3, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 2.32, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{3}}{\arctan\left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{9}c^{3}x^{9}+4\,a^{7}c^{3}x^{7}+6\,a^{5}c^{3}x^{5}+4\,a^{3}c^{3}x^{3}-2\,a^{2}sage_{0}x\arctan\left(ax\right)^{2}+ac^{3}x+\left(9\,a^{10}c^{3}x^{10}+37\,a^{8}c^{3}x^{8}+58\,a^{6}c^{3}x^{6}\right.}{2\,a^{2}\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^9*c^3*x^9 + 4*a^7*c^3*x^7 + 6*a^5*c^3*x^5 + 4*a^3*c^3*x^3 + a*c^3*x
 - 2*a^2*arctan(a*x)^2*integrate((45*a^8*c^3*x^9 + 148*a^6*c^3*x^7 + 174*a^
4*c^3*x^5 + 84*a^2*c^3*x^3 + 13*c^3*x)/arctan(a*x), x) + (9*a^10*c^3*x^10 +
 37*a^8*c^3*x^8 + 58*a^6*c^3*x^6 + 42*a^4*c^3*x^4 + 13*a^2*c^3*x^2 + c^3)*a
rctan(a*x))/(a^2*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^3}{{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^3,x)
```

```
[Out] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{x}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x^{3}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{5}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{7}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3/atan(a*x)**3,x)
```

```
[Out] c**3*(Integral(x/atan(a*x)**3, x) + Integral(3*a**2*x**3/atan(a*x)**3, x) +
 Integral(3*a**4*x**5/atan(a*x)**3, x) + Integral(a**6*x**7/atan(a*x)**3, x
))
```

3.617 $\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/ArcTan[a*x]^3,x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3} \, dx = \int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3} \, dx$$

Mathematica [A] time = 1.25, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^3,x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^6 + 3\,a^4c^3x^4 + 3\,a^2c^3x^2 + c^3}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)/arctan(a*x)^3,
 x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 2.04, size = 0, normalized size = 0.00

$$\int \frac{(a^2c\,x^2+c)^3}{\arctan(ax)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a^2*c*x^2+c)^3/arctan(a*x)^3,x)

[Out] int((a^2*c*x^2+c)^3/arctan(a*x)^3,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^8c^3x^8+4\,a^6c^3x^6+6\,a^4c^3x^4+4\,a^2c^3x^2-8\,a\arctan(ax)^2\int\frac{9\,a^8c^3x^8+28\,a^6c^3x^6+30\,a^4c^3x^4+12\,a^2c^3x^2+c^3}{\arctan(ax)}\,dx+c^3+8\,(a^9c}{2\,a\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")

[Out] -1/2*(a^8*c^3*x^8 + 4*a^6*c^3*x^6 + 6*a^4*c^3*x^4 + 4*a^2*c^3*x^2 - 2*a*arc
tan(a*x)^2*integrate(4*(9*a^8*c^3*x^8 + 28*a^6*c^3*x^6 + 30*a^4*c^3*x^4 + 1
2*a^2*c^3*x^2 + c^3)/arctan(a*x), x) + c^3 + 8*(a^9*c^3*x^9 + 4*a^7*c^3*x^7
 + 6*a^5*c^3*x^5 + 4*a^3*c^3*x^3 + a*c^3*x)*arctan(a*x))/(a*arctan(a*x)^2)

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{(c\,a^2\,x^2+c)^3}{\mathrm{atan}(a\,x)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c + a^2*c*x^2)^3/atan(a*x)^3,x)

[Out] int((c + a^2*c*x^2)^3/atan(a*x)^3, x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int\frac{3a^2x^2}{\mathrm{atan}^3(ax)}\,dx+\int\frac{3a^4x^4}{\mathrm{atan}^3(ax)}\,dx+\int\frac{a^6x^6}{\mathrm{atan}^3(ax)}\,dx+\int\frac{1}{\mathrm{atan}^3(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a**2*c*x**2+c)**3/atan(a*x)**3,x)

[Out] c**3*(Integral(3*a**2*x**2/atan(a*x)**3, x) + Integral(3*a**4*x**4/atan(a*x
)**3, x) + Integral(a**6*x**6/atan(a*x)**3, x) + Integral(atan(a*x)**(-3),
x))

3.618 $\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a^2cx^2+c)^3}{x\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/x/arctan(a*x)^3,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^3),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^3}\,dx = \int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3}{x\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)/(x*arctan(a*x)
^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 2.21, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3}}{x \arctan \left(a x \right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/x/arctan(a*x)^3,x)
```

```
[Out] int((a^2*c*x^2+c)^3/x/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a^{9} c^{3} x^{9} + 4 \, a^{7} c^{3} x^{7} + 6 \, a^{5} c^{3} x^{5} + 4 \, a^{3} c^{3} x^{3} - 2 \, sage_{0} x^{3} \arctan\left(a x\right)^{2} + a c^{3} x + {\left(7 \, a^{10} c^{3} x^{10} + 27 \, a^{8} c^{3} x^{8} + 38 \, a^{6} c^{3} x^{6} + \right.}}{2 \, a^{2} x^{2} \arctan\left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a^9*c^3*x^9 + 4*a^7*c^3*x^7 + 6*a^5*c^3*x^5 + 4*a^3*c^3*x^3 + a*c^3*x
 - 2*x^2*arctan(a*x)^2*integrate((28*a^10*c^3*x^10 + 81*a^8*c^3*x^8 + 76*a^
6*c^3*x^6 + 22*a^4*c^3*x^4 + c^3)/(x^3*arctan(a*x)), x) + (7*a^10*c^3*x^10
+ 27*a^8*c^3*x^8 + 38*a^6*c^3*x^6 + 22*a^4*c^3*x^4 + 3*a^2*c^3*x^2 - c^3)*a
rctan(a*x))/(a^2*x^2*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^3}{x\,{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/(x*atan(a*x)^3),x)
```

```
[Out] int((c + a^2*c*x^2)^3/(x*atan(a*x)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{1}{x \operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{3}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{5}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/x/atan(a*x)**3,x)
```

```
[Out] c**3*(Integral(1/(x*atan(a*x)**3), x) + Integral(3*a**2*x/atan(a*x)**3, x)
+ Integral(3*a**4*x**3/atan(a*x)**3, x) + Integral(a**6*x**5/atan(a*x)**3,
x))
```

3.619 $\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=43

$$\frac{3\text{Int}\left(\frac{x^2}{\tan^{-1}(ax)^2},x\right)}{2ac}-\frac{x^3}{2ac\tan^{-1}(ax)^2}$$

```
[Out] -1/2*x^3/a/c/arctan(a*x)^2+3/2*Unintegrable(x^2/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] -x^3/(2*a*c*ArcTan[a*x]^2) + (3*Defer[Int][x^2/ArcTan[a*x]^2, x])/(2*a*c)
```

Rubi steps

$$\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx=-\frac{x^3}{2ac\tan^{-1}(ax)^2}+\frac{3\int \frac{x^2}{\tan^{-1}(ax)^2}\,dx}{2ac}$$

Mathematica [A] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^3}{(a^2cx^2+c)\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(x^3/((a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.94, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c\, x^2 + c\right) \arctan\left(a x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{a x^3 - 6 \arctan\left(a x\right)^2 \int \frac{2\, a^2 x^3 + x}{\arctan\left(a x\right)}\, dx + 3 \left(a^2 x^4 + x^2\right) \arctan\left(a x\right)}{2\, a^2 c \arctan\left(a x\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a*x^3 - 2*arctan(a*x)^2*integrate(3*(2*a^2*x^3 + x)/arctan(a*x), x) +
 3*(a^2*x^4 + x^2)*arctan(a*x))/(a^2*c*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^3}{\mathrm{atan}\left(a\, x\right)^3 \left(c\, a^2\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^2 x^2 \operatorname{atan}^3\left(a x\right) + \operatorname{atan}^3\left(a x\right)}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] Integral(x**3/(a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x)/c
```

3.620 $\int \frac{x^2}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=38

$$\frac{\text{Int}\left(\frac{x}{\tan^{-1}(ax)^2},x\right)}{ac}-\frac{x^2}{2ac\tan^{-1}(ax)^2}$$

```
[Out] -1/2*x^2/a/c/arctan(a*x)^2+Unintegrable(x/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] -x^2/(2*a*c*ArcTan[a*x]^2) + Defer[Int][x/ArcTan[a*x]^2, x]/(a*c)
```

Rubi steps

$$\int \frac{x^2}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx=-\frac{x^2}{2ac\tan^{-1}(ax)^2}+\frac{\int \frac{x}{\tan^{-1}(ax)^2}\,dx}{ac}$$

Mathematica [A] time = 0.62, size = 0, normalized size = 0.00

$$\int \frac{x^2}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] Integrate[x^2/((c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^2}{(a^2cx^2+c)\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(x^2/((a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2 c\, x^2 + c\right) \arctan\left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{-2\, sage_0 x \arctan\left(ax\right)^2 + ax^2 + 2\left(a^2 x^3 + x\right)\arctan\left(ax\right)}{2\, a^2 c \arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a*x^2 - 2*arctan(a*x)^2*integrate((3*a^2*x^2 + 1)/arctan(a*x), x) + 2
*(a^2*x^3 + x)*arctan(a*x))/(a^2*c*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{\mathrm{atan}\left(a\, x\right)^3 \left(c\, a^2\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^2 x^2 \operatorname{atan}^3\left(ax\right) + \operatorname{atan}^3\left(ax\right)}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] Integral(x**2/(a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x)/c
```

3.621 $\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=37

$$\frac{\text{Int}\left(\frac{1}{\tan^{-1}(ax)^2},x\right)}{2ac}-\frac{x}{2ac\tan^{-1}(ax)^2}$$

```
[Out] -1/2*x/a/c/arctan(a*x)^2+1/2*Unintegrable(1/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] -x/(2*a*c*ArcTan[a*x]^2) + Defer[Int][ArcTan[a*x]^(-2), x]/(2*a*c)
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx=-\frac{x}{2ac\tan^{-1}(ax)^2}+\frac{\int \frac{1}{\tan^{-1}(ax)^2}\,dx}{2ac}$$

Mathematica [A] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x}{\left(a^2cx^2+c\right)\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(x/((a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(x/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2 \, a^{2} sage_{0} x \arctan \left(a x\right)^{2} - a x - {\left(a^{2} x^{2} + 1\right)} \arctan \left(a x\right)}{2 \, a^{2} c \arctan \left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*a^2*arctan(a*x)^2*integrate(x/arctan(a*x), x) - a*x - (a^2*x^2 + 1)*
arctan(a*x))/(a^2*c*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{{\mathrm{atan}\left(a\,x\right)}^3\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(x/(atan(a*x)^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)} + \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] Integral(x/(a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x)/c
```

3.622 $\int \frac{1}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=16

$$-\frac{1}{2ac\tan^{-1}(ax)^2}$$

[Out] -1/2/a/c/arctan(a*x)^2

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4884}

$$-\frac{1}{2ac\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

[In] Int[1/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]

[Out] -1/(2*a*c*ArcTan[a*x]^2)

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{1}{(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx = -\frac{1}{2ac\tan^{-1}(ax)^2}$$

Mathematica [A] time = 0.00, size = 16, normalized size = 1.00

$$-\frac{1}{2ac\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

[In] Integrate[1/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]

[Out] -1/2*1/(a*c*ArcTan[a*x]^2)

fricas [A] time = 0.38, size = 14, normalized size = 0.88

$$-\frac{1}{2\,ac\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")

[Out] -1/2/(a*c*arctan(a*x)^2)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.06, size = 15, normalized size = 0.94

$$-\frac{1}{2ac\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)/arctan(a*x)^3,x)
[Out] -1/2/a/c/arctan(a*x)^2
```

maxima [A] time = 0.43, size = 14, normalized size = 0.88

$$-\frac{1}{2\,ac\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
[Out] -1/2/(a*c*arctan(a*x)^2)
```

mupad [B] time = 0.35, size = 14, normalized size = 0.88

$$-\frac{1}{2\,a\,c\,\mathrm{atan}\left(a\,x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^3*(c + a^2*c*x^2)),x)
[Out] -1/(2*a*c*atan(a*x)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{1}{2ac\,\mathrm{atan}^{2}\left(ax\right)} & \text{for}\ c \neq 0 \\ \tilde{\infty}\int\frac{1}{\mathrm{atan}^{3}\left(ax\right)}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)/atan(a*x)**3,x)
[Out] Piecewise((-1/(2*a*c*atan(a*x)**2), Ne(c, 0)), (zoo*Integral(atan(a*x)**(-3
), x), True))
```

3.623 $\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=43

$$-\frac{\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)^2},x\right)}{2ac}-\frac{1}{2acx\tan^{-1}(ax)^2}$$

```
[Out] -1/2/a/c/x/arctan(a*x)^2-1/2*Unintegrable(1/x^2/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c*x*ArcTan[a*x]^2) - Defer[Int][1/(x^2*ArcTan[a*x]^2), x]/(2*a*c)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx=-\frac{1}{2acx\tan^{-1}(ax)^2}-\frac{\int \frac{1}{x^2\tan^{-1}(ax)^2}\,dx}{2ac}$$

Mathematica [A] time = 0.48, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^3+cx\right)\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^2*c*x^3 + c*x)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 0.26, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)\arctan\left(ax\right)^{3}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\,sage_{0}x^{3}\arctan\left(ax\right)^{2}-ax+\left(a^{2}x^{2}+1\right)\arctan\left(ax\right)}{2\,a^{2}cx^{2}\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*x^2*arctan(a*x)^2*integrate(1/(x^3*arctan(a*x)), x) - a*x + (a^2*x^2
 + 1)*arctan(a*x))/(a^2*c*x^2*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{3}\,\left(c\,a^{2}\,x^{2}+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2}x^{3}\operatorname{atan}^{3}\left(ax\right)+x\operatorname{atan}^{3}\left(ax\right)}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**2*x**3*atan(a*x)**3 + x*atan(a*x)**3), x)/c
```

3.624 $\int \frac{1}{x^2(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=41

$$-\frac{\text{Int}\left(\frac{1}{x^3\tan^{-1}(ax)^2},x\right)}{ac}-\frac{1}{2acx^2\tan^{-1}(ax)^2}$$

```
[Out] -1/2/a/c/x^2/arctan(a*x)^2-Unintegrable(1/x^3/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] -1/(2*a*c*x^2*ArcTan[a*x]^2) - Defer[Int][1/(x^3*ArcTan[a*x]^2), x]/(a*c)
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx=-\frac{1}{2acx^2\tan^{-1}(ax)^2}-\frac{\int \frac{1}{x^3\tan^{-1}(ax)^2}\,dx}{ac}$$

Mathematica [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^4+cx^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(1/((a^2*c*x^4 + c*x^2)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.86, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2}\left(a^{2} c\,x^{2}+c\right) \arctan\left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\,sage_{0} x^{4} \arctan\left(a x\right)^{2}-a x+2\left(a^{2} x^{2}+1\right) \arctan\left(a x\right)}{2\,a^{2} c x^{3} \arctan\left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*x^3*arctan(a*x)^2*integrate((a^2*x^2 + 3)/(x^4*arctan(a*x)), x) - a*
x + 2*(a^2*x^2 + 1)*arctan(a*x))/(a^2*c*x^3*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x^{2}\,\mathrm{atan}\left(a\,x\right)^{3}\,\left(c\,a^{2}\,x^{2}+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2} x^{4} \operatorname{atan}^{3}{\left(a x\right)}+x^{2} \operatorname{atan}^{3}{\left(a x\right)}}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**2*x**4*atan(a*x)**3 + x**2*atan(a*x)**3), x)/c
```

3.625 $\int \frac{1}{x^3(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=43

$$-\frac{3\mathrm{Int}\left(\frac{1}{x^4\tan^{-1}(ax)^2},x\right)}{2ac}-\frac{1}{2acx^3\tan^{-1}(ax)^2}$$

```
[Out] -1/2/a/c/x^3/arctan(a*x)^2-3/2*Unintegrable(1/x^4/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c*x^3*ArcTan[a*x]^2) - (3*Defer[Int][1/(x^4*ArcTan[a*x]^2), x])/(2*
a*c)
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx=-\frac{1}{2acx^3\tan^{-1}(ax)^2}-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)^2}\,dx}{2ac}$$

Mathematica [A] time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{\left(a^2cx^5+cx^3\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^2*c*x^5 + c*x^3)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 2.56, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x)

[Out] int(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{6 \, x^{4} \arctan \left(a x\right)^{2} \int \frac{a^{2} x^{2} + 2}{x^{5} \arctan\left(a x\right)}\,{d x} - a x + 3 \, {\left(a^{2} x^{2} + 1\right)} \arctan \left(a x\right)}{2 \, a^{2} c x^{4} \arctan \left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^3/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")

[Out] 1/2*(2*x^4*arctan(a*x)^2*integrate(3*(a^2*x^2 + 2)/(x^5*arctan(a*x)), x) - a*x + 3*(a^2*x^2 + 1)*arctan(a*x))/(a^2*c*x^4*arctan(a*x)^2)

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^3\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)),x)

[Out] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)), x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2} x^{5} \operatorname{atan}^{3}{\left(a x \right)} + x^{3} \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x**3/(a**2*c*x**2+c)/atan(a*x)**3,x)

[Out] Integral(1/(a**2*x**5*atan(a*x)**3 + x**3*atan(a*x)**3), x)/c

3.626 $\int \frac{1}{x^4(c+a^2cx^2)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=41

$$-\frac{2\text{Int}\left(\frac{1}{x^5\tan^{-1}(ax)^2},x\right)}{ac}-\frac{1}{2acx^4\tan^{-1}(ax)^2}$$

```
[Out] -1/2/a/c/x^4/arctan(a*x)^2-2*Unintegrable(1/x^5/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c*x^4*ArcTan[a*x]^2) - (2*Defer[Int][1/(x^5*ArcTan[a*x]^2), x])/(a*
c)
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx=-\frac{1}{2acx^4\tan^{-1}(ax)^2}-\frac{2\int \frac{1}{x^5\tan^{-1}(ax)^2}\,dx}{ac}$$

Mathematica [A] time = 2.53, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^2cx^6+cx^4\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^2*c*x^6 + c*x^4)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.10, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(a^2 c\, x^2 + c\right) \arctan\left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{4\, x^5 \arctan\left(ax\right)^2 \int \frac{3\, a^2 x^2 + 5}{x^6 \arctan\left(ax\right)}\, dx - ax + 4\left(a^2 x^2 + 1\right) \arctan\left(ax\right)}{2\, a^2 c x^5 \arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*x^5*arctan(a*x)^2*integrate(2*(3*a^2*x^2 + 5)/(x^6*arctan(a*x)), x)
- a*x + 4*(a^2*x^2 + 1)*arctan(a*x))/(a^2*c*x^5*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x^4 \operatorname{atan}\left(a\, x\right)^3 \left(c\, a^2\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^2 x^6 \operatorname{atan}^3\left(ax\right) + x^4 \operatorname{atan}^3\left(ax\right)}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**2*x**6*atan(a*x)**3 + x**4*atan(a*x)**3), x)/c
```

3.627 $\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=116

$$\frac{\mathrm{Int}\left(\frac{1}{\tan^{-1}(ax)^2},x\right)}{2a^3c^2}+\frac{\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{a^4c^2}-\frac{x}{2a^3c^2\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2a^4c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{x}{2a^3c^2\left(a^2x^2+1\right)\tan^{-1}(ax}$$

```
[Out] -1/2*x/a^3/c^2/arctan(a*x)^2+1/2*x/a^3/c^2/(a^2*x^2+1)/arctan(a*x)^2+1/2*(-
a^2*x^2+1)/a^4/c^2/(a^2*x^2+1)/arctan(a*x)+Si(2*arctan(a*x))/a^4/c^2+1/2*Un
integrable(1/arctan(a*x)^2,x)/a^3/c^2
```

Rubi [A] time = 0.24, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -x/(2*a^3*c^2*ArcTan[a*x]^2) + x/(2*a^3*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2) +
(1 - a^2*x^2)/(2*a^4*c^2*(1 + a^2*x^2)*ArcTan[a*x]) + SinIntegral[2*ArcTan[
a*x]]/(a^4*c^2) + Defer[Int][ArcTan[a*x]^(-2), x]/(2*a^3*c^2)
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx=-\frac{\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx}{a^2}+\frac{\int \frac{x}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx}{a^2c}$$

$$=-\frac{x}{2a^3c^2\tan^{-1}(ax)^2}+\frac{x}{2a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2a^4c^2\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$=-\frac{x}{2a^3c^2\tan^{-1}(ax)^2}+\frac{x}{2a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2a^4c^2\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$=-\frac{x}{2a^3c^2\tan^{-1}(ax)^2}+\frac{x}{2a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2a^4c^2\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$=-\frac{x}{2a^3c^2\tan^{-1}(ax)^2}+\frac{x}{2a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2a^4c^2\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$=-\frac{x}{2a^3c^2\tan^{-1}(ax)^2}+\frac{x}{2a^3c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2a^4c^2\left(1+a^2x^2\right)\tan^{-1}(a}$$

Mathematica [A] time = 10.48, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^3}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(x^3/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2c\,x^2+c\right)^2\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
[Out] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{-2\left(a^4c^2x^2+a^2c^2\right)sage_0x\arctan\left(ax\right)^2+ax^3+\left(a^2x^4+3\,x^2\right)\arctan\left(ax\right)}{2\left(a^4c^2x^2+a^2c^2\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
[Out] -1/2*(a*x^3 - 2*(a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)^2*integrate((a^4*x^5 +
2*a^2*x^3 + 3*x)/((a^6*c^2*x^4 + 2*a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)), x)
+ (a^2*x^4 + 3*x^2)*arctan(a*x))/((a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^2),x)
[Out] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^4x^4\,\mathrm{atan}^3\,(ax)+2a^2x^2\,\mathrm{atan}^3\,(ax)+\mathrm{atan}^3\,(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(x**3/(a**4*x**4*atan(a*x)**3 + 2*a**2*x**2*atan(a*x)**3 + atan(a*x
)**3), x)/c**2
```

3.628 $\int \frac{x^2}{(c+a^2cx^2)^2 \tan^{-1}(ax)^3} dx$

Optimal. Leaf size=71

$$\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{a^3c^2}-\frac{x^2}{2ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}-\frac{x}{a^2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

```
[Out] -1/2*x^2/a/c^2/(a^2*x^2+1)/arctan(a*x)^2-x/a^2/c^2/(a^2*x^2+1)/arctan(a*x)+
Ci(2*arctan(a*x))/a^3/c^2
```

Rubi [A] time = 0.29, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4942, 4968, 4970, 3312, 3302, 4904}

$$\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{a^3c^2}-\frac{x^2}{2ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}-\frac{x}{a^2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -x^2/(2*a*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2) - x/(a^2*c^2*(1 + a^2*x^2)*ArcTa
n[a*x]) + CosIntegral[2*ArcTan[a*x]]/(a^3*c^2)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
```

```
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx = -\frac{x^2}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx}{a}$$

$$= -\frac{x^2}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{x}{a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(a}}{a^2}$$

$$= -\frac{x^2}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{x}{a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x}\,d\right.}{a^3c}$$

$$= -\frac{x^2}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{x}{a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\text{Subst}\left(\int\left(\frac{1}{2x}-\frac{\text{cc}}{}\right.\right.}{}$$

$$= -\frac{x^2}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{x}{a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+2\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\right.}{2a}$$

$$= -\frac{x^2}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{x}{a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}+\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{a^3c^2}$$

Mathematica [A] time = 0.12, size = 51, normalized size = 0.72

$$\frac{2\text{Ci}\left(2\tan^{-1}(ax)\right)-\frac{ax\left(ax+2\tan^{-1}(ax)\right)}{\left(a^2x^2+1\right)\tan^{-1}(ax)^2}}{2a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] (-((a*x*(a*x + 2*ArcTan[a*x]))/((1 + a^2*x^2)*ArcTan[a*x]^2)) + 2*CosIntegr
al[2*ArcTan[a*x]])/(2*a^3*c^2)
```

fricas [C] time = 0.49, size = 132, normalized size = 1.86

$$-\frac{a^2x^2-\left(a^2x^2+1\right)\arctan(ax)^2\,\text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right)-\left(a^2x^2+1\right)\arctan(ax)^2\,\text{log\_integral}\left(-\frac{a^2x^2-2i\,a}{a^2x^2+}\right.}{2\left(a^5c^2x^2+a^3c^2\right)\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/2*(a^2*x^2 - (a^2*x^2 + 1)*arctan(a*x)^2*log_integral(-(a^2*x^2 + 2*I*a*
x - 1)/(a^2*x^2 + 1)) - (a^2*x^2 + 1)*arctan(a*x)^2*log_integral(-(a^2*x^2
- 2*I*a*x - 1)/(a^2*x^2 + 1)) + 2*a*x*arctan(a*x))/((a^5*c^2*x^2 + a^3*c^2)
*arctan(a*x)^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.27, size = 52, normalized size = 0.73

$$\frac{4\,\mathrm{Ci}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}-2\sin\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)+\cos\left(2\arctan\left(ax\right)\right)-1}{4a^{3}c^{2}\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] 1/4/a^3/c^2*(4*Ci(2*arctan(a*x))*arctan(a*x)^2-2*sin(2*arctan(a*x))*arctan(
a*x)+cos(2*arctan(a*x))-1)/arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\left(a^{4}c^{2}x^{2}+a^{2}c^{2}\right)sage_{0}x\arctan\left(ax\right)^{2}+ax^{2}+2\,x\arctan\left(ax\right)}{2\left(a^{4}c^{2}x^{2}+a^{2}c^{2}\right)\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(2*(a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)^2*integrate((a^2*x^2 - 1)/((a^6
*c^2*x^4 + 2*a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)), x) + a*x^2 + 2*x*arctan(a
*x))/((a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2}}{a^{4} x^{4} \operatorname{atan}^{3}{\left(a x \right)} + 2 a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)} + \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(x**2/(a**4*x**4*atan(a*x)**3 + 2*a**2*x**2*atan(a*x)**3 + atan(a*x
)**3), x)/c**2
```

3.629 $\int \frac{x}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=81

$$-\frac{\operatorname{Si}\left(2\tan^{-1}(ax)\right)}{a^2c^2}-\frac{x}{2ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}-\frac{1-a^2x^2}{2a^2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

```
[Out] -1/2*x/a/c^2/(a^2*x^2+1)/arctan(a*x)^2+1/2*(a^2*x^2-1)/a^2/c^2/(a^2*x^2+1)/
arctan(a*x)-Si(2*arctan(a*x))/a^2/c^2
```

Rubi [A] time = 0.12, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4932, 4970, 4406, 12, 3299}

$$-\frac{\operatorname{Si}\left(2\tan^{-1}(ax)\right)}{a^2c^2}-\frac{x}{2ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}-\frac{1-a^2x^2}{2a^2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -x/(2*a*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2) - (1 - a^2*x^2)/(2*a^2*c^2*(1 + a^
2*x^2)*ArcTan[a*x]) - SinIntegral[2*ArcTan[a*x]]/(a^2*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4932

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*(x_))/((d_) + (e_.)*(x_)^2)^2,
 x_Symbol] :> Simp[(x*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p + 1)*(d + e*x^
2)), x] + (-Dist[4/(b^2*(p + 1)*(p + 2)), Int[(x*(a + b*ArcTan[c*x])^(p + 2
))/(d + e*x^2)^2, x], x] - Simp[((1 - c^2*x^2)*(a + b*ArcTan[c*x])^(p + 2))
/(b^2*e*(p + 1)*(p + 2)*(d + e*x^2)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[p, -1] && NeQ[p, -2]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx = -\frac{x}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{1-a^2x^2}{2a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-2\int \frac{x}{\left(c+a^2cx^2\right)^2\tan\cdots}$$

$$= -\frac{x}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{1-a^2x^2}{2a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin\cdots}{x}\cdots\right)}{a^2\cdots}$$

$$= -\frac{x}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{1-a^2x^2}{2a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{2\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{2x}\,d\cdots\right)}{a^2c^2}$$

$$= -\frac{x}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{1-a^2x^2}{2a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\mathrm{Subst}\left(\int \frac{\sin(2x)}{x}\,dx,\cdots\right)}{a^2c^2}$$

$$= -\frac{x}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{1-a^2x^2}{2a^2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}-\frac{\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{a^2c^2}$$

Mathematica [A] time = 0.06, size = 70, normalized size = 0.86

$$\frac{-2\left(a^2x^2+1\right)\tan^{-1}(ax)^2\mathrm{Si}\left(2\tan^{-1}(ax)\right)+\left(a^2x^2-1\right)\tan^{-1}(ax)-ax}{2a^2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] (-(a*x) + (-1 + a^2*x^2)*ArcTan[a*x] - 2*(1 + a^2*x^2)*ArcTan[a*x]^2*SinInt
egral[2*ArcTan[a*x]])/(2*a^2*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2)
```

fricas [C] time = 0.40, size = 135, normalized size = 1.67

$$\frac{\left(-i\,a^2x^2-i\right)\arctan(ax)^2\,\mathrm{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right)+\left(i\,a^2x^2+i\right)\arctan(ax)^2\,\mathrm{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right)-a\cdots}{2\left(a^4c^2x^2+a^2c^2\right)\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] 1/2*((-I*a^2*x^2 - I)*arctan(a*x)^2*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(
a^2*x^2 + 1)) + (I*a^2*x^2 + I)*arctan(a*x)^2*log_integral(-(a^2*x^2 - 2*I*
a*x - 1)/(a^2*x^2 + 1)) - a*x + (a^2*x^2 - 1)*arctan(a*x))/((a^4*c^2*x^2 +
a^2*c^2)*arctan(a*x)^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.27, size = 51, normalized size = 0.63

$$-\frac{4\,\mathrm{Si}\left(2\arctan(ax)\right)\arctan(ax)^2+2\cos\left(2\arctan(ax)\right)\arctan(ax)+\sin\left(2\arctan(ax)\right)}{4a^2c^2\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] -1/4/a^2/c^2*(4*Si(2*arctan(a*x))*arctan(a*x)^2+2*cos(2*arctan(a*x))*arctan
(a*x)+sin(2*arctan(a*x)))/arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{4\left(a^4c^2x^2+a^2c^2\right)\arctan\left(ax\right)^2\int\frac{x}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)}\,dx+ax-\left(a^2x^2-1\right)\arctan\left(ax\right)}{2\left(a^4c^2x^2+a^2c^2\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(8*(a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)^2*integrate(1/2*x/((a^4*c^2*x^4
 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)), x) + a*x - (a^2*x^2 - 1)*arctan(a*x))
/((a^4*c^2*x^2 + a^2*c^2)*arctan(a*x)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int\frac{x}{a^4x^4\operatorname{atan}^3\left(ax\right)+2a^2x^2\operatorname{atan}^3\left(ax\right)+\operatorname{atan}^3\left(ax\right)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(x/(a**4*x**4*atan(a*x)**3 + 2*a**2*x**2*atan(a*x)**3 + atan(a*x)**
3), x)/c**2
```

3.630 $\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=65

$$\frac{x}{c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{1}{2ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}-\frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{ac^2}$$

```
[Out] -1/2/a/c^2/(a^2*x^2+1)/arctan(a*x)^2+x/c^2/(a^2*x^2+1)/arctan(a*x)-Ci(2*arc
tan(a*x))/a/c^2
```

Rubi [A] time = 0.25, antiderivative size = 65, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {4902, 4968, 4970, 3312, 3302, 4904}

$$\frac{x}{c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{1}{2ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}-\frac{\text{CosIntegral}\left(2\tan^{-1}(ax)\right)}{ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2) + x/(c^2*(1 + a^2*x^2)*ArcTan[a*x]
) - CosIntegral[2*ArcTan[a*x]]/(a*c^2)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
```

```
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx = -\frac{1}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2} - a\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^2}\,dx$$

$$= -\frac{1}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)} + a^2\int \frac{x^2}{\left(c+a^2cx^2\right)^2 \text{t}}$$

$$= -\frac{1}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - \frac{\text{Subst}\left(\int \frac{\cos^2(x)}{x}\,dx,\right.}{ac^2}$$

$$= -\frac{1}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)} + \frac{\text{Subst}\left(\int\left(\frac{1}{2x} - \frac{\cos(}{2x}\right.\right.}{a}$$

$$= -\frac{1}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - 2\frac{\text{Subst}\left(\int \frac{\cos(2x)}{x}\,dx\right.}{2ac^2}$$

$$= -\frac{1}{2ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{x}{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)} - \frac{\text{Ci}\left(2\tan^{-1}(ax)\right)}{ac^2}$$

Mathematica [A] time = 0.07, size = 58, normalized size = 0.89

$$\frac{-2\left(a^2x^2+1\right)\tan^{-1}(ax)^2\text{Ci}\left(2\tan^{-1}(ax)\right)+2ax\tan^{-1}(ax)-1}{2c^2\left(a^3x^2+a\right)\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] (-1 + 2*a*x*ArcTan[a*x] - 2*(1 + a^2*x^2)*ArcTan[a*x]^2*CosIntegral[2*ArcTa
n[a*x]])/(2*c^2*(a + a^3*x^2)*ArcTan[a*x]^2)
```

fricas [C] time = 0.41, size = 122, normalized size = 1.88

$$-\frac{\left(a^2x^2+1\right)\arctan(ax)^2\,\text{log\_integral}\left(-\frac{a^2x^2+2i\,ax-1}{a^2x^2+1}\right)+\left(a^2x^2+1\right)\arctan(ax)^2\,\text{log\_integral}\left(-\frac{a^2x^2-2i\,ax-1}{a^2x^2+1}\right)-}{2\left(a^3c^2x^2+ac^2\right)\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/2*((a^2*x^2 + 1)*arctan(a*x)^2*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^
2*x^2 + 1)) + (a^2*x^2 + 1)*arctan(a*x)^2*log_integral(-(a^2*x^2 - 2*I*a*x
```

```
- 1)/(a^2*x^2 + 1)) - 2*a*x*arctan(a*x) + 1)/((a^3*c^2*x^2 + a*c^2)*arctan(
a*x)^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.24, size = 52, normalized size = 0.80

$$-\frac{4\,\mathrm{Ci}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}-2\sin\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)+\cos\left(2\arctan\left(ax\right)\right)+1}{4a\,c^{2}\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] -1/4/a/c^2*(4*Ci(2*arctan(a*x))*arctan(a*x)^2-2*sin(2*arctan(a*x))*arctan(a
*x)+cos(2*arctan(a*x))+1)/arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^{3}c^{2}x^{2}+ac^{2}\right)sage_{0}x\arctan\left(ax\right)^{2}+2\,ax\arctan\left(ax\right)-1}{2\left(a^{3}c^{2}x^{2}+ac^{2}\right)\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^3*c^2*x^2 + a*c^2)*arctan(a*x)^2*integrate((a^2*x^2 - 1)/((a^4*c^
2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)), x) + 2*a*x*arctan(a*x) - 1)/((a^
3*c^2*x^2 + a*c^2)*arctan(a*x)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{3}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4}x^{4}\operatorname{atan}^{3}{\left(ax\right)}+2a^{2}x^{2}\operatorname{atan}^{3}{\left(ax\right)}+\operatorname{atan}^{3}{\left(ax\right)}}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**4*x**4*atan(a*x)**3 + 2*a**2*x**2*atan(a*x)**3 + atan(a*x)**
3), x)/c**2
```

3.631 $\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=114

$$-\frac{\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)^2},x\right)}{2ac^2}+\frac{ax}{2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{1}{2ac^2x\tan^{-1}(ax)}$$

```
[Out] -1/2/a/c^2/x/arctan(a*x)^2+1/2*a*x/c^2/(a^2*x^2+1)/arctan(a*x)^2+1/2*(-a^2*
x^2+1)/c^2/(a^2*x^2+1)/arctan(a*x)+Si(2*arctan(a*x))/c^2-1/2*Unintegrable(1
/x^2/arctan(a*x)^2,x)/a/c^2
```

Rubi [A] time = 0.26, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^2*x*ArcTan[a*x]^2) + (a*x)/(2*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2) +
(1 - a^2*x^2)/(2*c^2*(1 + a^2*x^2)*ArcTan[a*x]) + SinIntegral[2*ArcTan[a*x]
]/c^2 - Defer[Int][1/(x^2*ArcTan[a*x]^2), x]/(2*a*c^2)
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx &= -\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx}{c}\\
&= -\frac{1}{2ac^2x\tan^{-1}(ax)^2}+\frac{ax}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}\\
&= -\frac{1}{2ac^2x\tan^{-1}(ax)^2}+\frac{ax}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}\\
&= -\frac{1}{2ac^2x\tan^{-1}(ax)^2}+\frac{ax}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}\\
&= -\frac{1}{2ac^2x\tan^{-1}(ax)^2}+\frac{ax}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}\\
&= -\frac{1}{2ac^2x\tan^{-1}(ax)^2}+\frac{ax}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)}
\end{aligned}$$

Mathematica [A] time = 1.94, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^3), x]
```

fricas [A] time = 1.08, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^{4}c^{2}x^{5}+2\,a^{2}c^{2}x^{3}+c^{2}x\right)\arctan\left(ax\right)^{3}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.82, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)^{2}\arctan\left(ax\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^{4}c^{2}x^{4}+a^{2}c^{2}x^{2}\right)sage_{0}x\arctan\left(ax\right)^{2}-ax+\left(3\,a^{2}x^{2}+1\right)\arctan\left(ax\right)}{2\left(a^{4}c^{2}x^{4}+a^{2}c^{2}x^{2}\right)\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^4*c^2*x^4 + a^2*c^2*x^2)*arctan(a*x)^2*integrate((3*a^4*x^4 + 2*a
^2*x^2 + 1)/((a^6*c^2*x^7 + 2*a^4*c^2*x^5 + a^2*c^2*x^3)*arctan(a*x)), x) -
 a*x + (3*a^2*x^2 + 1)*arctan(a*x))/((a^4*c^2*x^4 + a^2*c^2*x^2)*arctan(a*x
)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{3}\,\left(c\,a^{2}\,x^{2}+c\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^5\operatorname{atan}^3(ax)+2a^2x^3\operatorname{atan}^3(ax)+x\operatorname{atan}^3(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**4*x**5*atan(a*x)**3 + 2*a**2*x**3*atan(a*x)**3 + x*atan(a*x)
**3), x)/c**2
```

3.632 $\int \frac{1}{x^2(c+a^2cx^2)^2 \tan^{-1}(ax)^3} dx$

Optimal. Leaf size=104

$$-\frac{\text{Int}\left(\frac{1}{x^3 \tan^{-1}(ax)^2}, x\right)}{ac^2} - \frac{a^2x}{c^2(a^2x^2+1)\tan^{-1}(ax)} + \frac{a}{2c^2(a^2x^2+1)\tan^{-1}(ax)^2} + \frac{a\text{Ci}\left(2\tan^{-1}(ax)\right)}{c^2} - \frac{1}{2ac^2x^2\tan^{-1}(ax)^2}$$

```
[Out] -1/2/a/c^2/x^2/arctan(a*x)^2+1/2*a/c^2/(a^2*x^2+1)/arctan(a*x)^2-a^2*x/c^2/
(a^2*x^2+1)/arctan(a*x)+a*Ci(2*arctan(a*x))/c^2-Unintegrable(1/x^3/arctan(a
*x)^2,x)/a/c^2
```

Rubi [A] time = 0.39, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2(c+a^2cx^2)^2 \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^2*x^2*ArcTan[a*x]^2) + a/(2*c^2*(1 + a^2*x^2)*ArcTan[a*x]^2) - (a
^2*x)/(c^2*(1 + a^2*x^2)*ArcTan[a*x]) + (a*CosIntegral[2*ArcTan[a*x]])/c^2
- Defer[Int][1/(x^3*ArcTan[a*x]^2), x]/(a*c^2)
```

Rubi steps

$$\int \frac{1}{x^2(c+a^2cx^2)^2 \tan^{-1}(ax)^3} dx = -\left(a^2 \int \frac{1}{(c+a^2cx^2)^2 \tan^{-1}(ax)^3} dx\right) + \frac{\int \frac{1}{x^2(c+a^2cx^2)\tan^{-1}(ax)^3} dx}{c}$$

$$= -\frac{1}{2ac^2x^2\tan^{-1}(ax)^2} + \frac{a}{2c^2(1+a^2x^2)\tan^{-1}(ax)^2} + a^3 \int \frac{x}{(c+a^2cx^2)^2 \tan^{-1}(a$$

$$= -\frac{1}{2ac^2x^2\tan^{-1}(ax)^2} + \frac{a}{2c^2(1+a^2x^2)\tan^{-1}(ax)^2} - \frac{a^2x}{c^2(1+a^2x^2)\tan^{-1}(ax)} +$$

$$= -\frac{1}{2ac^2x^2\tan^{-1}(ax)^2} + \frac{a}{2c^2(1+a^2x^2)\tan^{-1}(ax)^2} - \frac{a^2x}{c^2(1+a^2x^2)\tan^{-1}(ax)} -$$

$$= -\frac{1}{2ac^2x^2\tan^{-1}(ax)^2} + \frac{a}{2c^2(1+a^2x^2)\tan^{-1}(ax)^2} - \frac{a^2x}{c^2(1+a^2x^2)\tan^{-1}(ax)} -$$

$$= -\frac{1}{2ac^2x^2\tan^{-1}(ax)^2} + \frac{a}{2c^2(1+a^2x^2)\tan^{-1}(ax)^2} - \frac{a^2x}{c^2(1+a^2x^2)\tan^{-1}(ax)} -$$

$$= -\frac{1}{2ac^2x^2\tan^{-1}(ax)^2} + \frac{a}{2c^2(1+a^2x^2)\tan^{-1}(ax)^2} - \frac{a^2x}{c^2(1+a^2x^2)\tan^{-1}(ax)} +$$

Mathematica [A] time = 2.82, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2(c+a^2cx^2)^2 \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4c^2x^6 + 2\,a^2c^2x^4 + c^2x^2\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.92, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a^2c\,x^2+c\right)^2\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
[Out] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^4c^2x^5 + a^2c^2x^3\right)sage_0x\arctan\left(ax\right)^2 - ax + 2\left(2\,a^2x^2 + 1\right)\arctan\left(ax\right)}{2\left(a^4c^2x^5 + a^2c^2x^3\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
[Out] 1/2*(2*(a^4*c^2*x^5 + a^2*c^2*x^3)*arctan(a*x)^2*integrate((6*a^4*x^4 + 7*a
^2*x^2 + 3)/((a^6*c^2*x^8 + 2*a^4*c^2*x^6 + a^2*c^2*x^4)*arctan(a*x)), x) -
 a*x + 2*(2*a^2*x^2 + 1)*arctan(a*x))/((a^4*c^2*x^5 + a^2*c^2*x^3)*arctan(a
*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^2),x)
[Out] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^6\operatorname{atan}^3(ax)+2a^2x^4\operatorname{atan}^3(ax)+x^2\operatorname{atan}^3(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**4*x**6*atan(a*x)**3 + 2*a**2*x**4*atan(a*x)**3 + x**2*atan(a
*x)**3), x)/c**2
```

3.633 $\int \frac{1}{x^3(c+a^2cx^2)^2 \tan^{-1}(ax)^3} dx$

Optimal. Leaf size=161

$$-\frac{3\text{Int}\left(\frac{1}{x^4\tan^{-1}(ax)^2},x\right)}{2ac^2}+\frac{a\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)^2},x\right)}{2c^2}-\frac{a^2\text{Si}\left(2\tan^{-1}(ax)\right)}{c^2}-\frac{a^2\left(1-a^2x^2\right)}{2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{a^3x}{2c^2\left(a^2x^2+1\right)\tan}$$

```
[Out] -1/2/a/c^2/x^3/arctan(a*x)^2+1/2*a/c^2/x/arctan(a*x)^2-1/2*a^3*x/c^2/(a^2*x
^2+1)/arctan(a*x)^2-1/2*a^2*(-a^2*x^2+1)/c^2/(a^2*x^2+1)/arctan(a*x)-a^2*Si
(2*arctan(a*x))/c^2-3/2*Unintegrable(1/x^4/arctan(a*x)^2,x)/a/c^2+1/2*a*Uni
ntegrable(1/x^2/arctan(a*x)^2,x)/c^2
```

Rubi [A] time = 0.41, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^2*x^3*ArcTan[a*x]^2) + a/(2*c^2*x*ArcTan[a*x]^2) - (a^3*x)/(2*c^2
*(1 + a^2*x^2)*ArcTan[a*x]^2) - (a^2*(1 - a^2*x^2))/(2*c^2*(1 + a^2*x^2)*Ar
cTan[a*x]) - (a^2*SinIntegral[2*ArcTan[a*x]])/c^2 - (3*Defer[Int][1/(x^4*Ar
cTan[a*x]^2), x])/(2*a*c^2) + (a*Defer[Int][1/(x^2*ArcTan[a*x]^2), x])/(2*c
^2)
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx=-\left(a^2\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x^3\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx}{c}$$

$$=-\frac{1}{2ac^2x^3\tan^{-1}(ax)^2}+a^4\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx-\frac{3\int \frac{1}{x^4\tan^{-1}(ax)^2}\,d}{2ac^2}$$

$$=-\frac{1}{2ac^2x^3\tan^{-1}(ax)^2}+\frac{a}{2c^2x\tan^{-1}(ax)^2}-\frac{a^3x}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{}{2c^2(}$$

$$=-\frac{1}{2ac^2x^3\tan^{-1}(ax)^2}+\frac{a}{2c^2x\tan^{-1}(ax)^2}-\frac{a^3x}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{}{2c^2(}$$

$$=-\frac{1}{2ac^2x^3\tan^{-1}(ax)^2}+\frac{a}{2c^2x\tan^{-1}(ax)^2}-\frac{a^3x}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{}{2c^2(}$$

$$=-\frac{1}{2ac^2x^3\tan^{-1}(ax)^2}+\frac{a}{2c^2x\tan^{-1}(ax)^2}-\frac{a^3x}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{}{2c^2(}$$

$$=-\frac{1}{2ac^2x^3\tan^{-1}(ax)^2}+\frac{a}{2c^2x\tan^{-1}(ax)^2}-\frac{a^3x}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-\frac{}{2c^2(}$$

Mathematica [A] time = 2.30, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.59, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4 c^2 x^7 + 2\,a^2 c^2 x^5 + c^2 x^3\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.69, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \left(a^2 c\, x^2 + c\right)^2 \arctan\left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{4\left(a^4 c^2 x^6 + a^2 c^2 x^4\right)\arctan\left(ax\right)^2 \int \frac{5\,a^4 x^4 + 7\,a^2 x^2 + 3}{\left(a^6 c^2 x^9 + 2\,a^4 c^2 x^7 + a^2 c^2 x^5\right)\arctan(ax)}\, dx - ax + \left(5\,a^2 x^2 + 3\right)\arctan\left(ax\right)}{2\left(a^4 c^2 x^6 + a^2 c^2 x^4\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^4*c^2*x^6 + a^2*c^2*x^4)*arctan(a*x)^2*integrate(2*(5*a^4*x^4 + 7
*a^2*x^2 + 3)/((a^6*c^2*x^9 + 2*a^4*c^2*x^7 + a^2*c^2*x^5)*arctan(a*x)), x)
 - a*x + (5*a^2*x^2 + 3)*arctan(a*x))/((a^4*c^2*x^6 + a^2*c^2*x^4)*arctan(a
*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^7\operatorname{atan}^3(ax)+2a^2x^5\operatorname{atan}^3(ax)+x^3\operatorname{atan}^3(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**4*x**7*atan(a*x)**3 + 2*a**2*x**5*atan(a*x)**3 + x**3*atan(a
*x)**3), x)/c**2
```

3.634 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=143

$$-\frac{2\text{Int}\left(\frac{1}{x^5\tan^{-1}(ax)^2},x\right)}{ac^2}+\frac{a\text{Int}\left(\frac{1}{x^3\tan^{-1}(ax)^2},x\right)}{c^2}-\frac{a^3\text{Ci}\left(2\tan^{-1}(ax)\right)}{c^2}+\frac{a^4x}{c^2\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{a^3}{2c^2\left(a^2x^2+1\right)\tan^{-1}(a}$$

```
[Out] -1/2/a/c^2/x^4/arctan(a*x)^2+1/2*a/c^2/x^2/arctan(a*x)^2-1/2*a^3/c^2/(a^2*x
^2+1)/arctan(a*x)^2+a^4*x/c^2/(a^2*x^2+1)/arctan(a*x)-a^3*Ci(2*arctan(a*x))
/c^2-2*Unintegrable(1/x^5/arctan(a*x)^2,x)/a/c^2+a*Unintegrable(1/x^3/arcta
n(a*x)^2,x)/c^2
```

Rubi [A] time = 0.55, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^2*x^4*ArcTan[a*x]^2) + a/(2*c^2*x^2*ArcTan[a*x]^2) - a^3/(2*c^2*(
1 + a^2*x^2)*ArcTan[a*x]^2) + (a^4*x)/(c^2*(1 + a^2*x^2)*ArcTan[a*x]) - (a^
3*CosIntegral[2*ArcTan[a*x]])/c^2 - (2*Defer[Int][1/(x^5*ArcTan[a*x]^2), x]
)/(a*c^2) + (a*Defer[Int][1/(x^3*ArcTan[a*x]^2), x])/c^2
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx = -\left(a^2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x^4\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx}{c}$$

$$= -\frac{1}{2ac^2x^4\tan^{-1}(ax)^2}+a^4\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx-\frac{2\int \frac{1}{x^5\tan^{-1}(ax)^2}\,dx}{ac^2}-$$

$$= -\frac{1}{2ac^2x^4\tan^{-1}(ax)^2}+\frac{a}{2c^2x^2\tan^{-1}(ax)^2}-\frac{a^3}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}-a^5\int$$

$$= -\frac{1}{2ac^2x^4\tan^{-1}(ax)^2}+\frac{a}{2c^2x^2\tan^{-1}(ax)^2}-\frac{a^3}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{}{c^2\left(1+\right.}$$

$$= -\frac{1}{2ac^2x^4\tan^{-1}(ax)^2}+\frac{a}{2c^2x^2\tan^{-1}(ax)^2}-\frac{a^3}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{}{c^2\left(1+\right.}$$

$$= -\frac{1}{2ac^2x^4\tan^{-1}(ax)^2}+\frac{a}{2c^2x^2\tan^{-1}(ax)^2}-\frac{a^3}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{}{c^2\left(1+\right.}$$

$$= -\frac{1}{2ac^2x^4\tan^{-1}(ax)^2}+\frac{a}{2c^2x^2\tan^{-1}(ax)^2}-\frac{a^3}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{}{c^2\left(1+\right.}$$

$$= -\frac{1}{2ac^2x^4\tan^{-1}(ax)^2}+\frac{a}{2c^2x^2\tan^{-1}(ax)^2}-\frac{a^3}{2c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^2}+\frac{}{c^2\left(1+\right.}$$

Mathematica [A] time = 7.12, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^4 c^2 x^8 + 2\,a^2 c^2 x^6 + c^2 x^4\right)\arctan\left(a x\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(1/((a^4*c^2*x^8 + 2*a^2*c^2*x^6 + c^2*x^4)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.94, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(a^2 c\,x^2+c\right)^2 \arctan\left(a x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
[Out] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^4 c^2 x^7 + a^2 c^2 x^5\right) sage_0 x \arctan\left(a x\right)^2 - a x + 2\left(3\,a^2 x^2 + 2\right)\arctan\left(a x\right)}{2\left(a^4 c^2 x^7 + a^2 c^2 x^5\right)\arctan\left(a x\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
[Out] 1/2*(2*(a^4*c^2*x^7 + a^2*c^2*x^5)*arctan(a*x)^2*integrate((15*a^4*x^4 + 23
*a^2*x^2 + 10)/((a^6*c^2*x^10 + 2*a^4*c^2*x^8 + a^2*c^2*x^6)*arctan(a*x)),
x) - a*x + 2*(3*a^2*x^2 + 2)*arctan(a*x))/((a^4*c^2*x^7 + a^2*c^2*x^5)*arct
an(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4x^8\operatorname{atan}^3(ax)+2a^2x^6\operatorname{atan}^3(ax)+x^4\operatorname{atan}^3(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**4*x**8*atan(a*x)**3 + 2*a**2*x**6*atan(a*x)**3 + x**4*atan(a
*x)**3), x)/c**2
```

3.635 $\int \frac{x^3}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=177

$$-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{2a^4c^3}+\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{a^4c^3}-\frac{1-a^2x^2}{2a^4c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{3}{2a^4c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}+\frac{2}{a^4c^3\left(a^2x^2+1\right)^2 \cdots}$$

```
[Out] 1/2*x/a^3/c^3/(a^2*x^2+1)^2/arctan(a*x)^2-1/2*x/a^3/c^3/(a^2*x^2+1)/arctan(
a*x)^2+2/a^4/c^3/(a^2*x^2+1)^2/arctan(a*x)-3/2/a^4/c^3/(a^2*x^2+1)/arctan(a
*x)+1/2*(a^2*x^2-1)/a^4/c^3/(a^2*x^2+1)/arctan(a*x)-1/2*Si(2*arctan(a*x))/a
^4/c^3+Si(4*arctan(a*x))/a^4/c^3
```

Rubi [A] time = 0.64, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4964, 4932, 4970, 4406, 12, 3299, 4968, 4902}

$$-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{2a^4c^3}+\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{a^4c^3}-\frac{x}{2a^3c^3\left(a^2x^2+1\right)\tan^{-1}(ax)^2}+\frac{x}{2a^3c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}-\frac{1-\cdots}{2a^4c^3\left(a^2x^2\cdots\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] x/(2*a^3*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2) - x/(2*a^3*c^3*(1 + a^2*x^2)*Ar
cTan[a*x]^2) + 2/(a^4*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) - 3/(2*a^4*c^3*(1 +
a^2*x^2)*ArcTan[a*x]) - (1 - a^2*x^2)/(2*a^4*c^3*(1 + a^2*x^2)*ArcTan[a*x])
 - SinIntegral[2*ArcTan[a*x]]/(2*a^4*c^3) + SinIntegral[4*ArcTan[a*x]]/(a^4
*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4932

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*(x_))/((d_) + (e_.)*(x_)^2)^2,
 x_Symbol] :> Simp[(x*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p + 1)*(d + e*x^
```

```
2)), x] + (-Dist[4/(b^2*(p + 1)*(p + 2)), Int[(x*(a + b*ArcTan[c*x])^(p + 2
))/(d + e*x^2)^2, x], x] - Simp[((1 - c^2*x^2)*(a + b*ArcTan[c*x])^(p + 2))
/(b^2*e*(p + 1)*(p + 2)*(d + e*x^2)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[p, -1] && NeQ[p, -2]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}\,dx = -\frac{\int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}\,dx}{a^2} + \frac{\int \frac{x}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3}\,dx}{a^2c}$$

$$= \frac{x}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{x}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} - \frac{1-a^2}{2a^4c^3\left(1+a^2x^2\right.}$$

$$= \frac{x}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{x}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{1}{2a^4c^3\left(1+a^2x^2\right.}$$

$$= \frac{x}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{x}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{2}{a^4c^3\left(1+a^2x^2\right)}$$

$$= \frac{x}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{x}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{2}{a^4c^3\left(1+a^2x^2\right)}$$

$$= \frac{x}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{x}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{2}{a^4c^3\left(1+a^2x^2\right)}$$

$$= \frac{x}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{x}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{2}{a^4c^3\left(1+a^2x^2\right)}$$

$$= \frac{x}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{x}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{2}{a^4c^3\left(1+a^2x^2\right)}$$

Mathematica [A] time = 0.26, size = 72, normalized size = 0.41

$$\frac{\frac{a^2x^2\left(\left(a^2x^2-3\right)\tan^{-1}(ax)-ax\right)}{\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2} - \mathrm{Si}\left(2\tan^{-1}(ax)\right) + 2\mathrm{Si}\left(4\tan^{-1}(ax)\right)}{2a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] ((a^2*x^2*(-(a*x) + (-3 + a^2*x^2)*ArcTan[a*x]))/((1 + a^2*x^2)^2*ArcTan[a*
x]^2) - SinIntegral[2*ArcTan[a*x]] + 2*SinIntegral[4*ArcTan[a*x]])/(2*a^4*c
^3)
```

fricas [C] time = 0.42, size = 328, normalized size = 1.85

$$-\frac{2\,a^3x^3 - \left(2i\,a^4x^4 + 4i\,a^2x^2 + 2i\right)\arctan(ax)^2\,\mathrm{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right) - \left(-2i\,a^4x^4 - 4i\,a^2x^2 - \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/4*(2*a^3*x^3 - (2*I*a^4*x^4 + 4*I*a^2*x^2 + 2*I)*arctan(a*x)^2*log_integ
ral((a^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2
+ 1)) - (-2*I*a^4*x^4 - 4*I*a^2*x^2 - 2*I)*arctan(a*x)^2*log_integral((a^4*
```

```
x^4 - 4*I*a^3*x^3 - 6*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) - (
-I*a^4*x^4 - 2*I*a^2*x^2 - I)*arctan(a*x)^2*log_integral(-(a^2*x^2 + 2*I*a*
x - 1)/(a^2*x^2 + 1)) - (I*a^4*x^4 + 2*I*a^2*x^2 + I)*arctan(a*x)^2*log_int
egral(-(a^2*x^2 - 2*I*a*x - 1)/(a^2*x^2 + 1)) - 2*(a^4*x^4 - 3*a^2*x^2)*arc
tan(a*x))/((a^8*c^3*x^4 + 2*a^6*c^3*x^2 + a^4*c^3)*arctan(a*x)^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.23, size = 90, normalized size = 0.51

$$-\frac{8\,\mathrm{Si}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}-16\,\mathrm{Si}\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}+4\cos\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)-4\cos\left(\right.}{16a^{4}c^{3}\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

```
[Out] -1/16/a^4/c^3*(8*Si(2*arctan(a*x))*arctan(a*x)^2-16*Si(4*arctan(a*x))*arcta
n(a*x)^2+4*cos(2*arctan(a*x))*arctan(a*x)-4*cos(4*arctan(a*x))*arctan(a*x)+
2*sin(2*arctan(a*x))-sin(4*arctan(a*x)))/arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{2\left(a^{6}c^{3}x^{4}+2\,a^{4}c^{3}x^{2}+a^{2}c^{3}\right)sage_{0}x\arctan\left(ax\right)^{2}+ax^{3}-\left(a^{2}x^{4}-3\,x^{2}\right)\arctan\left(ax\right)}{2\left(a^{6}c^{3}x^{4}+2\,a^{4}c^{3}x^{2}+a^{2}c^{3}\right)\arctan\left(ax\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] -1/2*(a*x^3 + 2*(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)*arctan(a*x)^2*integ
rate((5*a^2*x^3 - 3*x)/((a^8*c^3*x^6 + 3*a^6*c^3*x^4 + 3*a^4*c^3*x^2 + a^2*
c^3)*arctan(a*x)), x) - (a^2*x^4 - 3*x^2)*arctan(a*x))/((a^6*c^3*x^4 + 2*a^
4*c^3*x^2 + a^2*c^3)*arctan(a*x)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{{\mathrm{atan}\left(a\,x\right)}^3\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3}}{a^{6} x^{6} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{4} x^{4} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)} + \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
```

```
[Out] Integral(x**3/(a**6*x**6*atan(a*x)**3 + 3*a**4*x**4*atan(a*x)**3 + 3*a**2*x
**2*atan(a*x)**3 + atan(a*x)**3), x)/c**3
```

3.636 $\int \frac{x^2}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=120

$$\frac{\text{Ci}\left(4\tan^{-1}(ax)\right)}{a^3c^3}+\frac{x}{a^2c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{2x}{a^2c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}-\frac{1}{2a^3c^3\left(a^2x^2+1\right)\tan^{-1}(ax)^2}+\frac{}{2a^3c^3\,(}$$

```
[Out] 1/2/a^3/c^3/(a^2*x^2+1)^2/arctan(a*x)^2-1/2/a^3/c^3/(a^2*x^2+1)/arctan(a*x)
^2-2*x/a^2/c^3/(a^2*x^2+1)^2/arctan(a*x)+x/a^2/c^3/(a^2*x^2+1)/arctan(a*x)+
Ci(4*arctan(a*x))/a^3/c^3
```

Rubi [A] time = 0.60, antiderivative size = 120, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 8, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.364, Rules used = {4964, 4902, 4968, 4970, 3312, 3302, 4904, 4406}

$$\frac{\text{CosIntegral}\left(4\tan^{-1}(ax)\right)}{a^3c^3}+\frac{x}{a^2c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{2x}{a^2c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}-\frac{1}{2a^3c^3\left(a^2x^2+1\right)\tan^{-1}(ax}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] 1/(2*a^3*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2) - 1/(2*a^3*c^3*(1 + a^2*x^2)*Ar
cTan[a*x]^2) - (2*x)/(a^2*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) + x/(a^2*c^3*(1
+ a^2*x^2)*ArcTan[a*x]) + CosIntegral[4*ArcTan[a*x]]/(a^3*c^3)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
```

```
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx = -\frac{\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx}{a^2} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx}{a^2c}$$

$$= \frac{1}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{1}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} + \frac{2\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(}}{a}$$

$$= \frac{1}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{1}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} - \frac{2x}{a^2c^3\left(1+a^2x^2\right)^2 \text{ta}}$$

$$= \frac{1}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{1}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} - \frac{2x}{a^2c^3\left(1+a^2x^2\right)^2 \text{ta}}$$

$$= \frac{1}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{1}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} - \frac{2x}{a^2c^3\left(1+a^2x^2\right)^2 \text{ta}}$$

$$= \frac{1}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{1}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} - \frac{2x}{a^2c^3\left(1+a^2x^2\right)^2 \text{ta}}$$

$$= \frac{1}{2a^3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{1}{2a^3c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} - \frac{2x}{a^2c^3\left(1+a^2x^2\right)^2 \text{ta}}$$

Mathematica [A] time = 0.15, size = 60, normalized size = 0.50

$$\frac{\frac{ax\left(2\left(a^2x^2-1\right)\tan^{-1}(ax)-ax\right)}{\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}+2\mathrm{Ci}\left(4\tan^{-1}(ax)\right)}{2a^3c^3}$$

Antiderivative was successfully verified.

[In] Integrate[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]

[Out] ((a*x*(-(a*x) + 2*(-1 + a^2*x^2)*ArcTan[a*x]))/((1 + a^2*x^2)^2*ArcTan[a*x]^2) + 2*CosIntegral[4*ArcTan[a*x]])/(2*a^3*c^3)

fricas [C] time = 0.52, size = 215, normalized size = 1.79

$$-\frac{a^2x^2-\left(a^4x^4+2\,a^2x^2+1\right)\arctan(ax)^2\,\mathrm{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)-\left(a^4x^4+2\,a^2x^2+1\right)\arctan(}{2\left(a^7c^3x^4+2\,a^5c^3x^2+a^3c^3\right)\arctan(ax}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")

[Out] -1/2*(a^2*x^2 - (a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^2*log_integral((a^4*x^4 + 4*I*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) - (a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^2*log_integral((a^4*x^4 - 4*I*a^3*x^3 - 6*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) - 2*(a^3*x^3 - a*x)*arctan(a*x))/((a^7*c^3*x^4 + 2*a^5*c^3*x^2 + a^3*c^3)*arctan(a*x)^2)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")

[Out] Timed out

maple [A] time = 0.23, size = 52, normalized size = 0.43

$$\frac{16\,\mathrm{Ci}\left(4\arctan(ax)\right)\arctan(ax)^2-4\sin\left(4\arctan(ax)\right)\arctan(ax)+\cos\left(4\arctan(ax)\right)-1}{16a^3c^3\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)

[Out] 1/16/a^3/c^3*(16*Ci(4*arctan(a*x))*arctan(a*x)^2-4*sin(4*arctan(a*x))*arctan(a*x)+cos(4*arctan(a*x))-1)/arctan(a*x)^2

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)sage_0x\arctan(ax)^2-ax^2+2\left(a^2x^3-x\right)\arctan(ax)}{2\left(a^6c^3x^4+2\,a^4c^3x^2+a^2c^3\right)\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")

[Out] 1/2*(2*(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)*arctan(a*x)^2*integrate((a^4*x^4 - 6*a^2*x^2 + 1)/((a^8*c^3*x^6 + 3*a^6*c^3*x^4 + 3*a^4*c^3*x^2 + a^2*c

```
^3)*arctan(a*x)), x) - a*x^2 + 2*(a^2*x^3 - x)*arctan(a*x))/((a^6*c^3*x^4 +
 2*a^4*c^3*x^2 + a^2*c^3)*arctan(a*x)^2)
```

mupad **[F]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\operatorname{atan}(a\,x)^3\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^6x^6\operatorname{atan}^3(ax)+3a^4x^4\operatorname{atan}^3(ax)+3a^2x^2\operatorname{atan}^3(ax)+\operatorname{atan}^3(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
```

```
[Out] Integral(x**2/(a**6*x**6*atan(a*x)**3 + 3*a**4*x**4*atan(a*x)**3 + 3*a**2*x
**2*atan(a*x)**3 + atan(a*x)**3), x)/c**3
```

3.637 $\int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=113

$$-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{2a^2c^3}-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{a^2c^3}-\frac{x}{2ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}+\frac{3}{2a^2c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{2}{a^2c^3\left(a^2x^2+1\right.}$$

```
[Out] -1/2*x/a/c^3/(a^2*x^2+1)^2/arctan(a*x)^2-2/a^2/c^3/(a^2*x^2+1)^2/arctan(a*x
)+3/2/a^2/c^3/(a^2*x^2+1)/arctan(a*x)-1/2*Si(2*arctan(a*x))/a^2/c^3-Si(4*ar
ctan(a*x))/a^2/c^3
```

Rubi [A] time = 0.45, antiderivative size = 113, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 7, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.350, Rules used = {4968, 4964, 4902, 4970, 4406, 12, 3299}

$$-\frac{\text{Si}\left(2\tan^{-1}(ax)\right)}{2a^2c^3}-\frac{\text{Si}\left(4\tan^{-1}(ax)\right)}{a^2c^3}-\frac{x}{2ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}+\frac{3}{2a^2c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{2}{a^2c^3\left(a^2x^2+1\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -x/(2*a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2) - 2/(a^2*c^3*(1 + a^2*x^2)^2*Arc
Tan[a*x]) + 3/(2*a^2*c^3*(1 + a^2*x^2)*ArcTan[a*x]) - SinIntegral[2*ArcTan[
a*x]]/(2*a^2*c^3) - SinIntegral[4*ArcTan[a*x]]/(a^2*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
```

```
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx = -\frac{x}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx}{2a}-\frac{1}{2}(3a)\int \frac{x^2}{\left(c+a^2cx^2\right)^3 \ldots}$$

$$= -\frac{x}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}-\frac{1}{2a^2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-2\int \frac{x}{\left(c+a^2cx^2\right)^3 \ldots}$$

$$= -\frac{x}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}-\frac{2}{a^2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{3}{2a^2c^3\left(1+a^2x^2\right)\tan \ldots}$$

$$= -\frac{x}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}-\frac{2}{a^2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{3}{2a^2c^3\left(1+a^2x^2\right)\tan \ldots}$$

$$= -\frac{x}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}-\frac{2}{a^2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{3}{2a^2c^3\left(1+a^2x^2\right)\tan \ldots}$$

$$= -\frac{x}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}-\frac{2}{a^2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{3}{2a^2c^3\left(1+a^2x^2\right)\tan \ldots}$$

$$= -\frac{x}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}-\frac{2}{a^2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}+\frac{3}{2a^2c^3\left(1+a^2x^2\right)\tan \ldots}$$

Mathematica [A] time = 0.19, size = 98, normalized size = 0.87

$$-\frac{\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2\mathrm{Si}\left(2\tan^{-1}(ax)\right)+2\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2\mathrm{Si}\left(4\tan^{-1}(ax)\right)-3a^2x^2\tan^{-1}(ax)+ax+\tan \ldots}{2a^2c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -1/2*(a*x + ArcTan[a*x] - 3*a^2*x^2*ArcTan[a*x] + (1 + a^2*x^2)^2*ArcTan[a*
x]^2*SinIntegral[2*ArcTan[a*x]] + 2*(1 + a^2*x^2)^2*ArcTan[a*x]^2*SinIntegr
al[4*ArcTan[a*x]])/(a^2*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2)
```

fricas [C] time = 0.43, size = 314, normalized size = 2.78

$$\frac{\left(-2i\,a^4x^4 - 4i\,a^2x^2 - 2i\right)\arctan\left(ax\right)^2 \log\_integral\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right) + \left(2i\,a^4x^4 + 4i\,a^2x^2 + 2i\right)\arctan}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] 1/4*((-2*I*a^4*x^4 - 4*I*a^2*x^2 - 2*I)*arctan(a*x)^2*log_integral((a^4*x^4
 + 4*I*a^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (2*I
*a^4*x^4 + 4*I*a^2*x^2 + 2*I)*arctan(a*x)^2*log_integral((a^4*x^4 - 4*I*a^3
*x^3 - 6*a^2*x^2 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (-I*a^4*x^4 -
2*I*a^2*x^2 - I)*arctan(a*x)^2*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x
^2 + 1)) + (I*a^4*x^4 + 2*I*a^2*x^2 + I)*arctan(a*x)^2*log_integral(-(a^2*x
^2 - 2*I*a*x - 1)/(a^2*x^2 + 1)) - 2*a*x + 2*(3*a^2*x^2 - 1)*arctan(a*x))/(
(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)*arctan(a*x)^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.25, size = 88, normalized size = 0.78

$$-\frac{8\,\mathrm{Si}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)^2 + 16\,\mathrm{Si}\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)^2 + 4\cos\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right) + 4\,\mathrm{c}}{16a^2c^3\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

```
[Out] -1/16/a^2/c^3*(8*Si(2*arctan(a*x))*arctan(a*x)^2+16*Si(4*arctan(a*x))*arcta
n(a*x)^2+4*cos(2*arctan(a*x))*arctan(a*x)+4*cos(4*arctan(a*x))*arctan(a*x)+
2*sin(2*arctan(a*x))+sin(4*arctan(a*x)))/arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^6c^3x^4 + 2\,a^4c^3x^2 + a^2c^3\right)sage_0x\arctan\left(ax\right)^2 - ax + \left(3\,a^2x^2 - 1\right)\arctan\left(ax\right)}{2\left(a^6c^3x^4 + 2\,a^4c^3x^2 + a^2c^3\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^6*c^3*x^4 + 2*a^4*c^3*x^2 + a^2*c^3)*arctan(a*x)^2*integrate((3*a
^2*x^3 - 5*x)/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a
*x)), x) - a*x + (3*a^2*x^2 - 1)*arctan(a*x))/((a^6*c^3*x^4 + 2*a^4*c^3*x^2
 + a^2*c^3)*arctan(a*x)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^6x^6\operatorname{atan}^3(ax)+3a^4x^4\operatorname{atan}^3(ax)+3a^2x^2\operatorname{atan}^3(ax)+\operatorname{atan}^3(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
```

```
[Out] Integral(x/(a**6*x**6*atan(a*x)**3 + 3*a**4*x**4*atan(a*x)**3 + 3*a**2*x**2
*atan(a*x)**3 + atan(a*x)**3), x)/c**3
```

3.638 $\int \frac{1}{(c+a^2cx^2)^3 \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=81

$$\frac{2x}{c^3(a^2x^2+1)^2 \tan^{-1}(ax)} - \frac{1}{2ac^3(a^2x^2+1)^2 \tan^{-1}(ax)^2} - \frac{\text{Ci}(2\tan^{-1}(ax))}{ac^3} - \frac{\text{Ci}(4\tan^{-1}(ax))}{ac^3}$$

```
[Out] -1/2/a/c^3/(a^2*x^2+1)^2/arctan(a*x)^2+2*x/c^3/(a^2*x^2+1)^2/arctan(a*x)-Ci
(2*arctan(a*x))/a/c^3-Ci(4*arctan(a*x))/a/c^3
```

Rubi [A] time = 0.27, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.368$, Rules used = {4902, 4968, 4970, 4406, 3302, 4904, 3312}

$$\frac{2x}{c^3(a^2x^2+1)^2 \tan^{-1}(ax)} - \frac{1}{2ac^3(a^2x^2+1)^2 \tan^{-1}(ax)^2} - \frac{\text{CosIntegral}(2\tan^{-1}(ax))}{ac^3} - \frac{\text{CosIntegral}(4\tan^{-1}(ax))}{ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2) + (2*x)/(c^3*(1 + a^2*x^2)^2*Arc
Tan[a*x]) - CosIntegral[2*ArcTan[a*x]]/(a*c^3) - CosIntegral[4*ArcTan[a*x]]
/(a*c^3)
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
```

```
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$
\begin{aligned}
\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx &= -\frac{1}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}-(2a)\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx\\
&= -\frac{1}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{2x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-2\int \frac{1}{\left(c+a^2cx^2\right)^3\tan
\\
&= -\frac{1}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{2x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{2\,\mathrm{Subst}\left(\int \frac{\cos^4(x)}{x}\,dx,\right.}{ac^3}\\
&= -\frac{1}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{2x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{2\,\mathrm{Subst}\left(\int \left(\frac{3}{8x}+\frac{\cos}{2}\right.\right.}{}\\
&= -\frac{1}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{2x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{\mathrm{Subst}\left(\int \frac{\cos(4x)}{x}\,dx,x\right.}{4ac^3}\\
&= -\frac{1}{2ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{2x}{c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)}-\frac{\mathrm{Ci}\left(2\tan^{-1}(ax)\right)}{ac^3}-\frac{\mathrm{C}}{}
\end{aligned}
$$

Mathematica [A] time = 0.11, size = 89, normalized size = 1.10

$$
-\frac{2\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2\mathrm{Ci}\left(2\tan^{-1}(ax)\right)+2\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2\mathrm{Ci}\left(4\tan^{-1}(ax)\right)-4ax\tan^{-1}(ax)+1}{2ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -1/2*(1 - 4*a*x*ArcTan[a*x] + 2*(1 + a^2*x^2)^2*ArcTan[a*x]^2*CosIntegral[2
*ArcTan[a*x]] + 2*(1 + a^2*x^2)^2*ArcTan[a*x]^2*CosIntegral[4*ArcTan[a*x]])
/(a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2)
```

fricas [C] time = 0.46, size = 297, normalized size = 3.67

$$-\frac{\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^2\,\mathrm{log\_integral}\left(\frac{a^4x^4+4i\,a^3x^3-6\,a^2x^2-4i\,ax+1}{a^4x^4+2\,a^2x^2+1}\right)+\left(a^4x^4+2\,a^2x^2+1\right)\arctan\left(ax\right)^2\,\mathrm{lo}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] -1/2*((a^4*x^4 + 2*a^2*x^2 + 1)*arctan(a*x)^2*log_integral((a^4*x^4 + 4*I*a
^3*x^3 - 6*a^2*x^2 - 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (a^4*x^4 + 2
*a^2*x^2 + 1)*arctan(a*x)^2*log_integral((a^4*x^4 - 4*I*a^3*x^3 - 6*a^2*x^2
 + 4*I*a*x + 1)/(a^4*x^4 + 2*a^2*x^2 + 1)) + (a^4*x^4 + 2*a^2*x^2 + 1)*arct
an(a*x)^2*log_integral(-(a^2*x^2 + 2*I*a*x - 1)/(a^2*x^2 + 1)) + (a^4*x^4 +
 2*a^2*x^2 + 1)*arctan(a*x)^2*log_integral(-(a^2*x^2 - 2*I*a*x - 1)/(a^2*x^
2 + 1)) - 4*a*x*arctan(a*x) + 1)/((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arc
tan(a*x)^2)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.29, size = 89, normalized size = 1.10

$$-\frac{16\,\mathrm{Ci}\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)^2+16\,\mathrm{Ci}\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)^2-8\sin\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)-4\,\mathrm{s}}{16a\,c^3\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

```
[Out] -1/16/a/c^3*(16*Ci(2*arctan(a*x))*arctan(a*x)^2+16*Ci(4*arctan(a*x))*arctan
(a*x)^2-8*sin(2*arctan(a*x))*arctan(a*x)-4*sin(4*arctan(a*x))*arctan(a*x)+4
*cos(2*arctan(a*x))+cos(4*arctan(a*x))+3)/arctan(a*x)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{4\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)\arctan\left(ax\right)^2\int\frac{3\,a^2x^2-1}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)}\,dx+4\,ax\arctan\left(ax\right)-1}{2\left(a^5c^3x^4+2\,a^3c^3x^2+ac^3\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arctan(a*x)^2*integrate(2*(3*a
^2*x^2 - 1)/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x
)), x) + 4*a*x*arctan(a*x) - 1)/((a^5*c^3*x^4 + 2*a^3*c^3*x^2 + a*c^3)*arct
an(a*x)^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{1}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^6\operatorname{atan}^3(ax)+3a^4x^4\operatorname{atan}^3(ax)+3a^2x^2\operatorname{atan}^3(ax)+\operatorname{atan}^3(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**6*x**6*atan(a*x)**3 + 3*a**4*x**4*atan(a*x)**3 + 3*a**2*x**2
*atan(a*x)**3 + atan(a*x)**3), x)/c**3
```

3.639 $\int \frac{1}{x(c+a^2cx^2)^3 \tan^{-1}(ax)^3} dx$

Optimal. Leaf size=200

$$-\frac{\text{Int}\left(\frac{1}{x^2 \tan^{-1}(ax)^2}, x\right)}{2ac^3}+\frac{ax}{2c^3\left(a^2x^2+1\right)\tan^{-1}(ax)^2}+\frac{ax}{2c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2}+\frac{1-a^2x^2}{2c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{}{2c^3\left(a\right.}$$

```
[Out] -1/2/a/c^3/x/arctan(a*x)^2+1/2*a*x/c^3/(a^2*x^2+1)^2/arctan(a*x)^2+1/2*a*x/
c^3/(a^2*x^2+1)/arctan(a*x)^2+2/c^3/(a^2*x^2+1)^2/arctan(a*x)-3/2/c^3/(a^2*
x^2+1)/arctan(a*x)+1/2*(-a^2*x^2+1)/c^3/(a^2*x^2+1)/arctan(a*x)+3/2*Si(2*ar
ctan(a*x))/c^3+Si(4*arctan(a*x))/c^3-1/2*Unintegrable(1/x^2/arctan(a*x)^2,x
)/a/c^3
```

Rubi [A] time = 0.77, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^3*x*ArcTan[a*x]^2) + (a*x)/(2*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2)
+ (a*x)/(2*c^3*(1 + a^2*x^2)*ArcTan[a*x]^2) + 2/(c^3*(1 + a^2*x^2)^2*ArcTan
[a*x]) - 3/(2*c^3*(1 + a^2*x^2)*ArcTan[a*x]) + (1 - a^2*x^2)/(2*c^3*(1 + a^
2*x^2)*ArcTan[a*x]) + (3*SinIntegral[2*ArcTan[a*x]])/(2*c^3) + SinIntegral[
4*ArcTan[a*x]]/c^3 - Defer[Int][1/(x^2*ArcTan[a*x]^2), x]/(2*a*c^3)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx = -\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx\right) + \frac{\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx}{c}$$

$$= \frac{ax}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} - \frac{1}{2}a\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx + \frac{1}{2}\left(3a^3\right)\int \frac{}{(c}$$

$$= -\frac{1}{2ac^3x\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} +$$

$$= -\frac{1}{2ac^3x\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} +$$

$$= -\frac{1}{2ac^3x\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} +$$

$$= -\frac{1}{2ac^3x\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} +$$

$$= -\frac{1}{2ac^3x\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} +$$

$$= -\frac{1}{2ac^3x\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2} + \frac{ax}{2c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^2} +$$

Mathematica [A] time = 2.83, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x\right)\arctan(ax)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3 + c^3*x)*arctan(a*
x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.60, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^2 c\,x^2+c\right)^3 \arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2\left(a^6c^3x^6+2\,a^4c^3x^4+a^2c^3x^2\right)sage_0x\arctan\left(ax\right)^2-ax+\left(5\,a^2x^2+1\right)\arctan\left(ax\right)}{2\left(a^6c^3x^6+2\,a^4c^3x^4+a^2c^3x^2\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^6*c^3*x^6 + 2*a^4*c^3*x^4 + a^2*c^3*x^2)*arctan(a*x)^2*integrate(
(10*a^4*x^4 + 3*a^2*x^2 + 1)/((a^8*c^3*x^9 + 3*a^6*c^3*x^7 + 3*a^4*c^3*x^5
+ a^2*c^3*x^3)*arctan(a*x)), x) - a*x + (5*a^2*x^2 + 1)*arctan(a*x))/((a^6*
c^3*x^6 + 2*a^4*c^3*x^4 + a^2*c^3*x^2)*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^7\operatorname{atan}^3\left(ax\right)+3a^4x^5\operatorname{atan}^3\left(ax\right)+3a^2x^3\operatorname{atan}^3\left(ax\right)+x\operatorname{atan}^3\left(ax\right)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**6*x**7*atan(a*x)**3 + 3*a**4*x**5*atan(a*x)**3 + 3*a**2*x**3
*atan(a*x)**3 + x*atan(a*x)**3), x)/c**3
```

3.640 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx$

Optimal. Leaf size=168

$$-\frac{\text{Int}\left(\frac{1}{x^3 \tan^{-1}(ax)^2},x\right)}{ac^3}-\frac{a^2x}{c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}-\frac{2a^2x}{c^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)}+\frac{a}{2c^3\left(a^2x^2+1\right)\tan^{-1}(ax)^2}+\frac{\ldots}{2c^3\left(a^2x^2+\ldots\right.}$$

```
[Out] -1/2/a/c^3/x^2/arctan(a*x)^2+1/2*a/c^3/(a^2*x^2+1)^2/arctan(a*x)^2+1/2*a/c^
3/(a^2*x^2+1)/arctan(a*x)^2-2*a^2*x/c^3/(a^2*x^2+1)^2/arctan(a*x)-a^2*x/c^3
/(a^2*x^2+1)/arctan(a*x)+2*a*Ci(2*arctan(a*x))/c^3+a*Ci(4*arctan(a*x))/c^3-
Unintegrable(1/x^3/arctan(a*x)^2,x)/a/c^3
```

Rubi [A] time = 0.73, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^3*x^2*ArcTan[a*x]^2) + a/(2*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^2) +
a/(2*c^3*(1 + a^2*x^2)*ArcTan[a*x]^2) - (2*a^2*x)/(c^3*(1 + a^2*x^2)^2*ArcT
an[a*x]) - (a^2*x)/(c^3*(1 + a^2*x^2)*ArcTan[a*x]) + (2*a*CosIntegral[2*Arc
Tan[a*x]])/c^3 + (a*CosIntegral[4*ArcTan[a*x]])/c^3 - Defer[Int][1/(x^3*Arc
Tan[a*x]^2), x]/(a*c^3)
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx = -\left(a^2\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^3}\,dx}{c}$$

$$= \frac{a}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\left(2a^3\right)\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^2}\,dx+\frac{\int \frac{1}{x^2(c+}}{}$$

$$= -\frac{1}{2ac^3x^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$= -\frac{1}{2ac^3x^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$= -\frac{1}{2ac^3x^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$= -\frac{1}{2ac^3x^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$= -\frac{1}{2ac^3x^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)\tan^{-1}(a}$$

$$= -\frac{1}{2ac^3x^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^2}+\frac{a}{2c^3\left(1+a^2x^2\right)\tan^{-1}(a}$$

Mathematica [A] time = 4.03, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{1}{\left(a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4 + c^3*x^2)*arctan(
a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2 \left(a^{6} c^{3} x^{7}+2 \, a^{4} c^{3} x^{5}+a^{2} c^{3} x^{3}\right) sage_{0} x \arctan \left(a x\right)^{2}-a x+2 \, \left(3 \, a^{2} x^{2}+1\right) \arctan \left(a x\right)}{2 \, \left(a^{6} c^{3} x^{7}+2 \, a^{4} c^{3} x^{5}+a^{2} c^{3} x^{3}\right) \arctan \left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^6*c^3*x^7 + 2*a^4*c^3*x^5 + a^2*c^3*x^3)*arctan(a*x)^2*integrate(
(15*a^4*x^4 + 10*a^2*x^2 + 3)/((a^8*c^3*x^10 + 3*a^6*c^3*x^8 + 3*a^4*c^3*x^
6 + a^2*c^3*x^4)*arctan(a*x)), x) - a*x + 2*(3*a^2*x^2 + 1)*arctan(a*x))/((
a^6*c^3*x^7 + 2*a^4*c^3*x^5 + a^2*c^3*x^3)*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^3\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{8} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{4} x^{6} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{2} x^{4} \operatorname{atan}^{3}{\left(a x \right)} + x^{2} \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
```

```
[Out] Integral(1/(a**6*x**8*atan(a*x)**3 + 3*a**4*x**6*atan(a*x)**3 + 3*a**2*x**4
*atan(a*x)**3 + x**2*atan(a*x)**3), x)/c**3
```

3.641 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=248

$$-\frac{3\mathrm{Int}\left(\frac{1}{x^4\tan^{-1}(ax)^2},x\right)}{2ac^3}+\frac{a\mathrm{Int}\left(\frac{1}{x^2\tan^{-1}(ax)^2},x\right)}{c^3}-\frac{5a^2\mathrm{Si}\left(2\tan^{-1}(ax)\right)}{2c^3}-\frac{a^2\mathrm{Si}\left(4\tan^{-1}(ax)\right)}{c^3}-\frac{a^2\left(1-a^2x^2\right)}{c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

```
[Out] -1/2/a/c^3/x^3/arctan(a*x)^2+a/c^3/x/arctan(a*x)^2-1/2*a^3*x/c^3/(a^2*x^2+1
)^2/arctan(a*x)^2-a^3*x/c^3/(a^2*x^2+1)/arctan(a*x)^2-2*a^2/c^3/(a^2*x^2+1)
^2/arctan(a*x)+3/2*a^2/c^3/(a^2*x^2+1)/arctan(a*x)-a^2*(-a^2*x^2+1)/c^3/(a^
2*x^2+1)/arctan(a*x)-5/2*a^2*Si(2*arctan(a*x))/c^3-a^2*Si(4*arctan(a*x))/c^
3-3/2*Unintegrable(1/x^4/arctan(a*x)^2,x)/a/c^3+a*Unintegrable(1/x^2/arctan
(a*x)^2,x)/c^3
```

Rubi [A] time = 1.28, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^3*x^3*ArcTan[a*x]^2) + a/(c^3*x*ArcTan[a*x]^2) - (a^3*x)/(2*c^3*(
1 + a^2*x^2)^2*ArcTan[a*x]^2) - (a^3*x)/(c^3*(1 + a^2*x^2)*ArcTan[a*x]^2) -
 (2*a^2)/(c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) + (3*a^2)/(2*c^3*(1 + a^2*x^2)*A
rcTan[a*x]) - (a^2*(1 - a^2*x^2))/(c^3*(1 + a^2*x^2)*ArcTan[a*x]) - (5*a^2*
SinIntegral[2*ArcTan[a*x]])/(2*c^3) - (a^2*SinIntegral[4*ArcTan[a*x]])/c^3
- (3*Defer[Int][1/(x^4*ArcTan[a*x]^2), x])/(2*a*c^3) + (a*Defer[Int][1/(x^2
*ArcTan[a*x]^2), x])/c^3
```

Rubi steps

$$\int \frac{1}{x^3 \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}\,dx = -\left(a^2 \int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}\,dx\right) + \frac{\int \frac{1}{x^3\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3}\,dx}{c}$$

$$= a^4 \int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}\,dx + \frac{\int \frac{1}{x^3\left(c+a^2cx^2\right) \tan^{-1}(ax)^3}\,dx}{c^2} - 2\frac{a^2 \int \frac{1}{x\left(c+a^2cx^2\right)^2}}{c}$$

$$= -\frac{1}{2ac^3x^3 \tan^{-1}(ax)^2} - \frac{a^3x}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2} + \frac{1}{2}a^3 \int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}}$$

$$= -\frac{1}{2ac^3x^3 \tan^{-1}(ax)^2} - \frac{a^3x}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2} - \frac{a^2}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)}$$

$$= -\frac{1}{2ac^3x^3 \tan^{-1}(ax)^2} - \frac{a^3x}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2} - \frac{2a^2}{c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)}$$

$$= -\frac{1}{2ac^3x^3 \tan^{-1}(ax)^2} - \frac{a^3x}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2} - \frac{2a^2}{c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)}$$

$$= -\frac{1}{2ac^3x^3 \tan^{-1}(ax)^2} - \frac{a^3x}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2} - \frac{2a^2}{c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)}$$

$$= -\frac{1}{2ac^3x^3 \tan^{-1}(ax)^2} - \frac{a^3x}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2} - \frac{2a^2}{c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)}$$

$$= -\frac{1}{2ac^3x^3 \tan^{-1}(ax)^2} - \frac{a^3x}{2c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^2} - \frac{2a^2}{c^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)}$$

Mathematica [A] time = 5.29, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{1}{\left(a^6c^3x^9 + 3\,a^4c^3x^7 + 3\,a^2c^3x^5 + c^3x^3\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^6*c^3*x^9 + 3*a^4*c^3*x^7 + 3*a^2*c^3*x^5 + c^3*x^3)*arctan(
a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.45, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c\,x^{2}+c\right)^{3} \arctan \left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
[Out] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{2 \left(a^{6} c^{3} x^{8}+2 \, a^{4} c^{3} x^{6}+a^{2} c^{3} x^{4}\right) sage_{0} x \arctan \left(a x\right)^{2} - a x + \left(7 \, a^{2} x^{2}+3\right) \arctan \left(a x\right)}{2 \left(a^{6} c^{3} x^{8}+2 \, a^{4} c^{3} x^{6}+a^{2} c^{3} x^{4}\right) \arctan \left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
[Out] 1/2*(2*(a^6*c^3*x^8 + 2*a^4*c^3*x^6 + a^2*c^3*x^4)*arctan(a*x)^2*integrate(
(21*a^4*x^4 + 19*a^2*x^2 + 6)/((a^8*c^3*x^11 + 3*a^6*c^3*x^9 + 3*a^4*c^3*x^
7 + a^2*c^3*x^5)*arctan(a*x)), x) - a*x + (7*a^2*x^2 + 3)*arctan(a*x))/((a^
6*c^3*x^8 + 2*a^4*c^3*x^6 + a^2*c^3*x^4)*arctan(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^{3}\,{\mathrm{atan}\left(a\,x\right)}^{3}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{3}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^3),x)
[Out] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{9} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{4} x^{7} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{2} x^{5} \operatorname{atan}^{3}{\left(a x \right)} + x^{3} \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
[Out] Integral(1/(a**6*x**9*atan(a*x)**3 + 3*a**4*x**7*atan(a*x)**3 + 3*a**2*x**5
*atan(a*x)**3 + x**3*atan(a*x)**3), x)/c**3
```

3.642 $\int \frac{1}{x^4(c+a^2cx^2)^3 \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=208

$$-\frac{2\text{Int}\left(\frac{1}{x^5 \tan^{-1}(ax)^2}, x\right)}{ac^3}+\frac{2a\text{Int}\left(\frac{1}{x^3 \tan^{-1}(ax)^2}, x\right)}{c^3}-\frac{3a^3\text{Ci}\left(2\tan^{-1}(ax)\right)}{c^3}-\frac{a^3\text{Ci}\left(4\tan^{-1}(ax)\right)}{c^3}+\frac{2a^4x}{c^3\left(a^2x^2+1\right)\tan^{-1}(ax)}$$

```
[Out] -1/2/a/c^3/x^4/arctan(a*x)^2+a/c^3/x^2/arctan(a*x)^2-1/2*a^3/c^3/(a^2*x^2+1
)^2/arctan(a*x)^2-a^3/c^3/(a^2*x^2+1)/arctan(a*x)^2+2*a^4*x/c^3/(a^2*x^2+1)
^2/arctan(a*x)+2*a^4*x/c^3/(a^2*x^2+1)/arctan(a*x)-3*a^3*Ci(2*arctan(a*x))/
c^3-a^3*Ci(4*arctan(a*x))/c^3-2*Unintegrable(1/x^5/arctan(a*x)^2,x)/a/c^3+2
*a*Unintegrable(1/x^3/arctan(a*x)^2,x)/c^3
```

Rubi [A] time = 1.40, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4 \left(c + a^2cx^2\right)^3 \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c^3*x^4*ArcTan[a*x]^2) + a/(c^3*x^2*ArcTan[a*x]^2) - a^3/(2*c^3*(1
+ a^2*x^2)^2*ArcTan[a*x]^2) - a^3/(c^3*(1 + a^2*x^2)*ArcTan[a*x]^2) + (2*a^
4*x)/(c^3*(1 + a^2*x^2)^2*ArcTan[a*x]) + (2*a^4*x)/(c^3*(1 + a^2*x^2)*ArcTa
n[a*x]) - (3*a^3*CosIntegral[2*ArcTan[a*x]])/c^3 - (a^3*CosIntegral[4*ArcTa
n[a*x]])/c^3 - (2*Defer[Int][1/(x^5*ArcTan[a*x]^2), x])/(a*c^3) + (2*a*Defe
r[Int][1/(x^3*ArcTan[a*x]^2), x])/c^3
```

Rubi steps

$$\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^3} \, dx = -\left(a^2 \int \frac{1}{x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^3} \, dx\right) + \frac{\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^3} \, dx}{c}$$

$$= a^4 \int \frac{1}{\left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^3} \, dx + \frac{\int \frac{1}{x^4 \left(c+a^2 c x^2\right) \tan^{-1}(ax)^3} \, dx}{c^2} - 2\frac{a^2 \int \frac{1}{x^2 (c+a^2}}{}$$

$$= -\frac{1}{2ac^3 x^4 \tan^{-1}(ax)^2} - \frac{a^3}{2c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(ax)^2} - \left(2a^5\right) \int \frac{x}{\left(c+a^2 c x^2\right)^3 t}$$

$$= -\frac{1}{2ac^3 x^4 \tan^{-1}(ax)^2} - \frac{a^3}{2c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(ax)^2} + \frac{2a^4 x}{c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(a}$$

$$= -\frac{1}{2ac^3 x^4 \tan^{-1}(ax)^2} - \frac{a^3}{2c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(ax)^2} + \frac{2a^4 x}{c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(a}$$

$$= -\frac{1}{2ac^3 x^4 \tan^{-1}(ax)^2} - \frac{a^3}{2c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(ax)^2} + \frac{2a^4 x}{c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(a}$$

$$= -\frac{1}{2ac^3 x^4 \tan^{-1}(ax)^2} - \frac{a^3}{2c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(ax)^2} + \frac{2a^4 x}{c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(a}$$

$$= -\frac{1}{2ac^3 x^4 \tan^{-1}(ax)^2} - \frac{a^3}{2c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(ax)^2} + \frac{2a^4 x}{c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(a}$$

$$= -\frac{1}{2ac^3 x^4 \tan^{-1}(ax)^2} - \frac{a^3}{2c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(ax)^2} + \frac{2a^4 x}{c^3 \left(1+a^2 x^2\right)^2 \tan^{-1}(a}$$

Mathematica [A] time = 9.95, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.63, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{1}{\left(a^6 c^3 x^{10} + 3\, a^4 c^3 x^8 + 3\, a^2 c^3 x^6 + c^3 x^4\right) \arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(1/((a^6*c^3*x^10 + 3*a^4*c^3*x^8 + 3*a^2*c^3*x^6 + c^3*x^4)*arctan
(a*x)^3), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [**A**] time = 2.51, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
[Out] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{4\left(a^6c^3x^9+2\,a^4c^3x^7+a^2c^3x^5\right)\arctan\left(ax\right)^2\int\frac{14\,a^4x^4+15\,a^2x^2+5}{\left(a^8c^3x^{12}+3\,a^6c^3x^{10}+3\,a^4c^3x^8+a^2c^3x^6\right)\arctan(ax)}\,dx-ax+4\left(2\,a^2x^2+1\right)\text{arct}}{2\left(a^6c^3x^9+2\,a^4c^3x^7+a^2c^3x^5\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
[Out] 1/2*(2*(a^6*c^3*x^9 + 2*a^4*c^3*x^7 + a^2*c^3*x^5)*arctan(a*x)^2*integrate(
2*(14*a^4*x^4 + 15*a^2*x^2 + 5)/((a^8*c^3*x^12 + 3*a^6*c^3*x^10 + 3*a^4*c^3
*x^8 + a^2*c^3*x^6)*arctan(a*x)), x) - a*x + 4*(2*a^2*x^2 + 1)*arctan(a*x))
/((a^6*c^3*x^9 + 2*a^4*c^3*x^7 + a^2*c^3*x^5)*arctan(a*x)^2)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^3\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)^3),x)
[Out] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)^3), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{10} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{4} x^{8} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{2} x^{6} \operatorname{atan}^{3}{\left(a x \right)} + x^{4} \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**3/atan(a*x)**3,x)
[Out] Integral(1/(a**6*x**10*atan(a*x)**3 + 3*a**4*x**8*atan(a*x)**3 + 3*a**2*x**
6*atan(a*x)**3 + x**4*atan(a*x)**3), x)/c**3
```

3.643 $\int \left(\frac{x^3}{(1+a^2x^2)\tan^{-1}(ax)^3}-\frac{3x^2}{2a\tan^{-1}(ax)^2}\right)dx$

Optimal. Leaf size=16

$$-\frac{x^3}{2a\tan^{-1}(ax)^2}$$

```
[Out] -1/2*x^3/a/arctan(a*x)^2
```

Rubi [A] time = 0.09, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 2, number of rules used = 1, integrand size = 38, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.026, Rules used = {4926}

$$-\frac{x^3}{2a\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((1 + a^2*x^2)*ArcTan[a*x]^3) - (3*x^2)/(2*a*ArcTan[a*x]^2),x]
```

```
[Out] -x^3/(2*a*ArcTan[a*x]^2)
```

Rule 4926

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_))/((d_) + (e_
.)*(x_)^2), x_Symbol] :> Simp[((f*x)^m*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*
(p + 1)), x] - Dist[(f*m)/(b*c*d*(p + 1)), Int[(f*x)^(m - 1)*(a + b*ArcTan[
c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] &
& LtQ[p, -1]
```

Rubi steps

$$\begin{aligned}\int \left(\frac{x^3}{(1+a^2x^2)\tan^{-1}(ax)^3}-\frac{3x^2}{2a\tan^{-1}(ax)^2}\right)dx &= -\frac{3\int \frac{x^2}{\tan^{-1}(ax)^2}\,dx}{2a}+\int \frac{x^3}{(1+a^2x^2)\tan^{-1}(ax)^3}\,dx\\ &= -\frac{x^3}{2a\tan^{-1}(ax)^2}\end{aligned}$$

Mathematica [A] time = 0.15, size = 16, normalized size = 1.00

$$-\frac{x^3}{2a\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/((1 + a^2*x^2)*ArcTan[a*x]^3) - (3*x^2)/(2*a*ArcTan[a*x]^2),x
]
```

```
[Out] -1/2*x^3/(a*ArcTan[a*x]^2)
```

fricas [A] time = 0.45, size = 14, normalized size = 0.88

$$-\frac{x^3}{2\,a\arctan(ax)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*x^2+1)/arctan(a*x)^3-3/2*x^2/a/arctan(a*x)^2,x, algorith
m="fricas")
```

```
[Out] -1/2*x^3/(a*arctan(a*x)^2)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*x^2+1)/arctan(a*x)^3-3/2*x^2/a/arctan(a*x)^2,x, algorith
m="giac")
```

```
[Out] sage0*x
```

maple [F] time = 2.44, size = 0, normalized size = 0.00

$$\int \frac{x^{3}}{\left(a^{2} x^{2}+1\right) \arctan \left(a x\right)^{3}}-\frac{3 x^{2}}{2 a \arctan \left(a x\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*x^2+1)/arctan(a*x)^3-3/2*x^2/a/arctan(a*x)^2,x)
```

```
[Out] int(x^3/(a^2*x^2+1)/arctan(a*x)^3-3/2*x^2/a/arctan(a*x)^2,x)
```

maxima [A] time = 0.48, size = 14, normalized size = 0.88

$$-\frac{x^{3}}{2 \, a \arctan \left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*x^2+1)/arctan(a*x)^3-3/2*x^2/a/arctan(a*x)^2,x, algorith
m="maxima")
```

```
[Out] -1/2*x^3/(a*arctan(a*x)^2)
```

mupad [B] time = 0.43, size = 14, normalized size = 0.88

$$-\frac{x^3}{2\,a\,{\mathrm{atan}\left(a\,x\right)}^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^3*(a^2*x^2 + 1)) - (3*x^2)/(2*a*atan(a*x)^2),x)
```

```
[Out] -x^3/(2*a*atan(a*x)^2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{\int \left(- \frac{2 a x^{3}}{a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)} + \operatorname{atan}^{3}{\left(a x \right)}}\right)\, dx + \int \frac{3 x^{2} \operatorname{atan}{\left(a x \right)}}{a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)} + \operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x^{4} \operatorname{atan}{\left(a x \right)}}{a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)} + \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{2 a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*x**2+1)/atan(a*x)**3-3/2*x**2/a/atan(a*x)**2,x)
```

```
[Out] -(Integral(-2*a*x**3/(a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x) + Integral
(3*x**2*atan(a*x)/(a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x) + Integral(3*
a**2*x**4*atan(a*x)/(a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x))/(2*a)
```

3.644 $\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3,x]
[Out] Defer[Int][(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx=\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.94, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3,x]
[Out] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x/arctan(a*x)^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.75, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{a^2c\,x^2+c}}{\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
[Out] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2cx^2+c}\,x}{\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*x/arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\sqrt{c\,a^2\,x^2+c}}{\mathrm{atan}\left(a\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^3,x)
[Out] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c\left(a^2x^2+1\right)}}{\mathrm{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(1/2)/atan(a*x)**3,x)
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))/atan(a*x)**3, x)
```

3.645 $\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^3,x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx=\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^3,x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/arctan(a*x)^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c \,x^{2}+c}}{\arctan \left(a x \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
[Out] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2}+c}}{\arctan \left(a x\right)^{3}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)/arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^3,x)
[Out] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/atan(a*x)**3,x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/atan(a*x)**3, x)
```

3.646 $\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{x\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^3,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^3),x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^3}\,dx = \int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 3.61, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^3),x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{x\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/(x*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.85, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c\,x^{2}+c}}{x \arctan \left(a x\right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^3,x)
[Out] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c x^{2}+c}}{x \arctan \left(a x\right)^{3}}\,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)/(x*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{x\,{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^3),x)
[Out] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{x \operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/x/atan(a*x)**3,x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/(x*atan(a*x)**3), x)
```

3.647 $\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3,x]

[Out] Defer[Int][(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3, x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 6.61, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3,x]

[Out] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3, x]

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^3+cx\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral((a^2*c*x^3 + c*x)*sqrt(a^2*c*x^2 + c)/arctan(a*x)^3, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 2.01, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^2 c\,x^2+c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)

[Out] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}x}{\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(3/2)*x/arctan(a*x)^3, x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\left(c\,a^2\,x^2+c\right)^{3/2}}{\mathrm{atan}\left(a\,x\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^3,x)

[Out] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^3, x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)

[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)/atan(a*x)**3, x)

3.648 $\int \frac{(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{(a^2cx^2+c)^{3/2}}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^3,x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)^3}\,dx = \int \frac{(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^3,x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.39, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(a^2cx^2+c)^{\frac{3}{2}}}{\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)/arctan(a*x)^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.63, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\, x^2 + c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c x^2 + c\right)^{\frac{3}{2}}}{\arctan\left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate((a^2*c*x^2 + c)^(3/2)/arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\, a^2\, x^2 + c\right)^{3/2}}{\mathrm{atan}\left(a\, x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^3,x)
```

```
[Out] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c\left(a^2 x^2 + 1\right)\right)^{\frac{3}{2}}}{\mathrm{atan}^3\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/atan(a*x)**3, x)
```

3.649 $\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{x\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^3,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^3),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^3}\,dx=\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 4.46, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^3),x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}}{x\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)/(x*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.92, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{x \arctan \left(a x \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^3,x)
[Out] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(a^{2} c x^{2} + c\right)}^{\frac{3}{2}}}{x \arctan \left(a x\right)^{3}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(3/2)/(x*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^3),x)
[Out] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{x \operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/x/atan(a*x)**3,x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/(x*atan(a*x)**3), x)
```

3.650 $\int \frac{x(c+a^2cx^2)^{5/2}}{\tan^{-1}(ax)^3} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3,x]

[Out] Defer[Int][(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3, x]

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 2.31, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3,x]

[Out] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3, x]

fricas [A] time = 1.32, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*sqrt(a^2*c*x^2 + c)/arctan(a*x)^3, x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 2.16, size = 0, normalized size = 0.00

$$\int \frac{x \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}{\arctan \left(a x \right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)

[Out] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(a^{2} c x^{2} + c\right)}^{\frac{5}{2}} x}{\arctan \left(a x\right)^{3}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(5/2)*x/arctan(a*x)^3, x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^3,x)

[Out] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^3, x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)

[Out] Integral(x*(c*(a**2*x**2 + 1))**(5/2)/atan(a*x)**3, x)

3.651 $\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^3,x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.28, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^3,x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^3, x]
```

fricas [A] time = 1.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)/arctan(a*x
)^3, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.58, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{\arctan \left(a x\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
[Out] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}}}{\arctan \left(a x\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)/arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^3,x)
[Out] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)/atan(a*x)**3, x)
```

3.652 $\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{x\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^3,x)
```

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^3),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^3}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 2.78, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^3), x]
```

fricas [A] time = 1.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}}{x\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)/(x*arctan(
a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.86, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{x \arctan\left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^3,x)
[Out] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c x^{2}+c\right)^{\frac{5}{2}}}{x \arctan\left(a x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)/(x*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^3),x)
[Out] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2}+1\right)\right)^{\frac{5}{2}}}{x \operatorname{atan}^{3}{\left(a x \right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/x/atan(a*x)**3,x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)/(x*atan(a*x)**3), x)
```

3.653 $\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
```

```
[Out] Defer[Int][x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx=\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.39, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]
```

fricas [A] time = 1.10, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x}{\sqrt{a^2cx^2+c}\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(x/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.51, size = 0, normalized size = 0.00

$$\int \frac{x}{\arctan(ax)^3\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{a^2cx^2+c}\arctan{(ax)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(x/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^3\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c\left(a^2x^2+1\right)}\operatorname{atan}^3{(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3), x)
```

3.654 $\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=24

$$\mathrm{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
[Out] Defer[Int][1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx=\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
[Out] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{1}{\sqrt{a^2cx^2+c}\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(1/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{1}{\arctan\left(ax\right)^{3} \sqrt{a^{2} c\, x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^{2} c x^{2} + c} \arctan\left(a x\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^3\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c \left(a^{2} x^{2} + 1\right)} \operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3), x)
```

3.655 $\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=68

$$-\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{2a}-\frac{\sqrt{a^2cx^2+c}}{2acx\tan^{-1}(ax)^2}$$

```
[Out] -1/2*(a^2*c*x^2+c)^(1/2)/a/c/x/arctan(a*x)^2-1/2*Unintegrable(1/x^2/arctan(
a*x)^2/(a^2*c*x^2+c)^(1/2),x)/a
```

Rubi [A] time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
```

```
[Out] -Sqrt[c + a^2*c*x^2]/(2*a*c*x*ArcTan[a*x]^2) - Defer[Int][1/(x^2*Sqrt[c + a
^2*c*x^2]*ArcTan[a*x]^2), x]/(2*a)
```

Rubi steps

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx=-\frac{\sqrt{c+a^2cx^2}}{2acx\tan^{-1}(ax)^2}-\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}\,dx}{2a}$$

Mathematica [A] time = 7.52, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.86, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^2cx^3+cx\right)\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^2*c*x^3 + c*x)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{1}{x \arctan(ax)^3 \sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^2 c x^2 + c}\, x \arctan(ax)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*x*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\, \mathrm{atan}(a\, x)^3 \sqrt{c\, a^2\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \sqrt{c \left(a^2 x^2 + 1\right)}\, \mathrm{atan}^3(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3), x)
```

3.656 $\int \frac{1}{x^2 \sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]

[Out] Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]

Rubi steps

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx = \int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 5.45, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]

[Out] Integrate[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]

fricas [A] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^2cx^4+cx^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)/((a^2*c*x^4 + c*x^2)*arctan(a*x)^3), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")

[Out] Timed out

maple [A] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \arctan \left(a x \right)^{3} \sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^{2} c x^{2} + c} x^{2} \arctan \left(a x\right)^{3}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*x^2*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^3\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \sqrt{c \left(a^{2} x^{2} + 1\right)} \operatorname{atan}^{3}{\left (a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(x**2*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3), x)
```

3.657 $\int \frac{1}{x^3 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x^3 \sqrt{a^2 c x^2+c} \tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(1/x^3/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

[In] Int[1/(x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]

[Out] Defer[Int][1/(x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]

Rubi steps

$$\int \frac{1}{x^3 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^3} \, dx = \int \frac{1}{x^3 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^3} \, dx$$

Mathematica [A] time = 6.85, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[1/(x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]

[Out] Integrate[1/(x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2 c x^2+c}}{\left(a^2 c x^5+c x^3\right) \arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^3/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)/((a^2*c*x^5 + c*x^3)*arctan(a*x)^3), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^3/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")

[Out] Timed out

maple [A] time = 2.06, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \arctan \left(a x\right)^{3} \sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/x^3/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^{2} c x^{2} + c} x^{3} \arctan \left(a x\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(1/(sqrt(a^2*c*x^2 + c)*x^3*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^3\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \sqrt{c \left(a^{2} x^{2} + 1\right)} \operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(x**3*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3), x)
```

3.658 $\int \frac{x^3}{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=136

$$\frac{\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)}{a^2c}+\frac{\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{2a^4c\sqrt{a^2cx^2+c}}+\frac{1}{2a^4c\sqrt{a^2cx^2+c}\tan^{-1}(ax)}+\frac{x}{2a^3c\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}$$

```
[Out] 1/2*x/a^3/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)+1/2/a^4/c/arctan(a*x)/(a^2*c*
x^2+c)^(1/2)+1/2*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^4/c/(a^2*c*x^2+c)^(1/2
)+Unintegrable(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/a^2/c
```

Rubi [A] time = 0.51, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] x/(2*a^3*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) + 1/(2*a^4*c*Sqrt[c + a^2*c*x
^2]*ArcTan[a*x]) + (Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(2*a^4*c*Sq
rt[c + a^2*c*x^2]) + Defer[Int][x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]/(
a^2*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3}{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^3}\,dx &= -\frac{\int \frac{x}{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^3}\,dx}{a^2}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{a^2c}\\
&= \frac{x}{2a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{\int \frac{1}{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^2}\,dx}{2a^3}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{a^2c}\\
&= \frac{x}{2a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{1}{2a^4c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{x}{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)}\,dx}{2a^2}\\
&= \frac{x}{2a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{1}{2a^4c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{a^2c}\\
&= \frac{x}{2a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{1}{2a^4c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{a^2c}\\
&= \frac{x}{2a^3c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{1}{2a^4c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\tan^{-1}(ax)\right)}{2a^4c\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [A] time = 2.46, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^3/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.50, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(x^3/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.659 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=135

$$\frac{\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3},x\right)}{a^2c}-\frac{x}{2a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}+\frac{\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{2a^3c\sqrt{a^2cx^2+c}}+\frac{1}{2a^3c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}$$

```
[Out] 1/2/a^3/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)-1/2*x/a^2/c/arctan(a*x)/(a^2*c*
x^2+c)^(1/2)+1/2*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2
)+Unintegrable(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/a^2/c
```

Rubi [A] time = 0.41, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] 1/(2*a^3*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) - x/(2*a^2*c*Sqrt[c + a^2*c*x
^2]*ArcTan[a*x]) + (Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(2*a^3*c*Sq
rt[c + a^2*c*x^2]) + Defer[Int][1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]/(
a^2*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3} \, dx &= -\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3} \, dx}{a^2}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} \, dx}{a^2c}\\
&= \frac{1}{2a^3c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}+\frac{\int \frac{x}{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} \, dx}{2a}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} \, d
\end{aligned}$$

$$\begin{aligned}
&= \frac{1}{2a^3c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}-\frac{x}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(a}}{2a^2}\\
&= \frac{1}{2a^3c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}-\frac{x}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3}}{a^2c}\\
&= \frac{1}{2a^3c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}-\frac{x}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3}}{a^2c}\\
&= \frac{1}{2a^3c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2}-\frac{x}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)}+\frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan\right.}{2a^3c\sqrt{c+a^2c}}
\end{aligned}$$

Mathematica [A] time = 2.23, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.45, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(x^2/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.660 $\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=104

$$-\frac{\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{2a^2c\sqrt{a^2cx^2+c}}-\frac{x}{2ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}-\frac{1}{2a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

```
[Out] -1/2*x/a/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)-1/2/a^2/c/arctan(a*x)/(a^2*c*x
^2+c)^(1/2)-1/2*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.32, antiderivative size = 104, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4942, 4902, 4971, 4970, 3299}

$$-\frac{\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{2a^2c\sqrt{a^2cx^2+c}}-\frac{x}{2ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}-\frac{1}{2a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] -x/(2*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) - 1/(2*a^2*c*Sqrt[c + a^2*c*x^
2]*ArcTan[a*x]) - (Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(2*a^2*c*Sqr
t[c + a^2*c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
```

```
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx = -\frac{x}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx}{2a}$$

$$= -\frac{x}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{1}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{1}{2}\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}}$$

$$= -\frac{x}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{1}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\int \frac{}{(1+a^2}}{2c\sqrt{c+}}$$

$$= -\frac{x}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{1}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}(}{2a^2c}$$

$$= -\frac{x}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{1}{2a^2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Si}\left(\tan\right.}{2a^2c\sqrt{c+a^2c}}$$

Mathematica [A] time = 0.13, size = 63, normalized size = 0.61

$$-\frac{\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Si}\left(\tan^{-1}(ax)\right)+ax+\tan^{-1}(ax)}{2a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] -1/2*(a*x + ArcTan[a*x] + Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*SinIntegral[ArcTa
n[a*x]])/(a^2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(
a*x)^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 1.17, size = 313, normalized size = 3.01

$$-\frac{i\left(\mathrm{Ei}\left(1,-i\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}x^{2}a^{2}+\sqrt{a^{2}x^{2}+1}\ \arctan\left(ax\right)xa+\mathrm{Ei}\left(1,-i\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}-i\right.}{4\arctan\left(ax\right)^{2}\left(a^{4}x^{4}+2a^{2}x^{2}+\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

```
[Out] -1/4*I*(Ei(1,-I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arctan
(a*x)*x*a+Ei(1,-I*arctan(a*x))*arctan(a*x)^2-I*(a^2*x^2+1)^(1/2)*x*a-(a^2*x
^2+1)^(1/2)-I*(a^2*x^2+1)^(1/2)*arctan(a*x))*(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(
I+a*x))^(1/2)/arctan(a*x)^2/(a^4*x^4+2*a^2*x^2+1)/c^2/a^2+1/4*I*(Ei(1,I*arc
tan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+I*(a^2*x^
2+1)^(1/2)*x*a+Ei(1,I*arctan(a*x))*arctan(a*x)^2+I*(a^2*x^2+1)^(1/2)*arctan
(a*x)-(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan
(a*x)^2/c^2/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2}cx^{2}+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(x/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{3}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^{3}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral(x/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.661 $\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=101

$$-\frac{\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{2ac\sqrt{a^2cx^2+c}}+\frac{x}{2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}-\frac{1}{2ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}$$

```
[Out] -1/2/a/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)+1/2*x/c/arctan(a*x)/(a^2*c*x^2+c
)^(1/2)-1/2*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.22, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4902, 4942, 4905, 4904, 3302}

$$-\frac{\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(\tan^{-1}(ax)\right)}{2ac\sqrt{a^2cx^2+c}}+\frac{x}{2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}-\frac{1}{2ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) + x/(2*c*Sqrt[c + a^2*c*x^2]*A
rcTan[a*x]) - (Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(2*a*c*Sqrt[c +
a^2*c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
```

```
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx = -\frac{1}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{1}{2}a\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx$$
$$= -\frac{1}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} + \frac{x}{2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{1}{2}\int \frac{1}{\left(c+a^2cx^2\right)^{3}}$$
$$= -\frac{1}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} + \frac{x}{2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\int \frac{}{(1+a}}{2c\sqrt{c+}}$$
$$= -\frac{1}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} + \frac{x}{2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\ \text{Subst}}{2ac}$$
$$= -\frac{1}{2ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} + \frac{x}{2c\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)} - \frac{\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan\right.}{2ac\sqrt{c+a^2c}}$$

Mathematica [A] time = 0.08, size = 65, normalized size = 0.64

$$\frac{-\sqrt{a^2x^2+1}\,\tan^{-1}(ax)^2\text{Ci}\left(\tan^{-1}(ax)\right)+ax\tan^{-1}(ax)-1}{2ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] (-1 + a*x*ArcTan[a*x] - Sqrt[1 + a^2*x^2]*ArcTan[a*x]^2*CosIntegral[ArcTan[
a*x]])/(2*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*
x)^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.65, size = 292, normalized size = 2.89

$$\frac{\left(\text{Ei}\left(1,i\arctan\left(ax\right)\right)\arctan\left(ax\right)^2x^2a^2+\sqrt{a^2x^2+1}\,\arctan\left(ax\right)xa+i\sqrt{a^2x^2+1}\,xa+\text{Ei}\left(1,i\arctan\left(ax\right)\right)\text{arct}\right.}{4\left(a^2x^2+1\right)^{\frac{3}{2}}\arctan\left(ax\right)^2c^2a}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

```
[Out] 1/4*(Ei(1,I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arctan(a*x
)*x*a+I*(a^2*x^2+1)^(1/2)*x*a+Ei(1,I*arctan(a*x))*arctan(a*x)^2+I*(a^2*x^2+
1)^(1/2)*arctan(a*x)-(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x
))^(1/2)/arctan(a*x)^2/c^2/a+1/4*(Ei(1,-I*arctan(a*x))*arctan(a*x)^2*x^2*a^
2+(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+Ei(1,-I*arctan(a*x))*arctan(a*x)^2-I*(a
^2*x^2+1)^(1/2)*x*a-(a^2*x^2+1)^(1/2)-I*(a^2*x^2+1)^(1/2)*arctan(a*x))/(a^2
*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)^2/c^2/a
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.662 $\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=166

$$-\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{2ac}-\frac{\sqrt{a^2cx^2+c}}{2ac^2x\tan^{-1}(ax)^2}+\frac{\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{2c\sqrt{a^2cx^2+c}}+\frac{ax}{2c\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}+\frac{}{2c\sqrt{a^2}}$$

```
[Out] 1/2*a*x/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)+1/2/c/arctan(a*x)/(a^2*c*x^2+c)
^(1/2)+1/2*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-1/2*(a^2
*c*x^2+c)^(1/2)/a/c^2/x/arctan(a*x)^2-1/2*Unintegrable(1/x^2/arctan(a*x)^2/
(a^2*c*x^2+c)^(1/2),x)/a/c
```

Rubi [A] time = 0.63, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] (a*x)/(2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) - Sqrt[c + a^2*c*x^2]/(2*a*c^
2*x*ArcTan[a*x]^2) + 1/(2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) + (Sqrt[1 + a^
2*x^2]*SinIntegral[ArcTan[a*x]])/(2*c*Sqrt[c + a^2*c*x^2]) - Defer[Int][1/(
x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]/(2*a*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx &= -\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{c}\\
&= \frac{ax}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{\sqrt{c+a^2cx^2}}{2ac^2x\tan^{-1}(ax)^2}-\frac{1}{2}a\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}}\\
&= \frac{ax}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{\sqrt{c+a^2cx^2}}{2ac^2x\tan^{-1}(ax)^2}+\frac{1}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\\
&= \frac{ax}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{\sqrt{c+a^2cx^2}}{2ac^2x\tan^{-1}(ax)^2}+\frac{1}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\\
&= \frac{ax}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{\sqrt{c+a^2cx^2}}{2ac^2x\tan^{-1}(ax)^2}+\frac{1}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\\
&= \frac{ax}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{\sqrt{c+a^2cx^2}}{2ac^2x\tan^{-1}(ax)^2}+\frac{1}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}
\end{aligned}$$

Mathematica [A] time = 2.61, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^5+2\,a^2c^2x^3+c^2x\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^5 + 2*a^2*c^2*x^3 + c^2*x)*arctan(
a*x)^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
[Out] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^{3}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.663 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=131

$$\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)}{c}+\frac{a\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{2c\sqrt{a^2cx^2+c}}-\frac{a^2x}{2c\sqrt{a^2cx^2+c}\tan^{-1}(ax)}+\frac{a}{2c\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}$$

```
[Out] 1/2*a/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)-1/2*a^2*x/c/arctan(a*x)/(a^2*c*x^
2+c)^(1/2)+1/2*a*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/2)+Un
integrable(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/c
```

Rubi [A] time = 0.46, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] a/(2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) - (a^2*x)/(2*c*Sqrt[c + a^2*c*x^2
]*ArcTan[a*x]) + (a*Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(2*c*Sqrt[c
 + a^2*c*x^2]) + Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]/c
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx &= -\left(a^2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{c}\\
&= \frac{a}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{1}{2}a^3\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx+\frac{\int \frac{1}{x^2\sqrt{c+a^2}\cdots}}{}\\
&= \frac{a}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{a^2x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{1}{2}a^2\int \frac{1}{\left(c+a^2cx^2\right)^{3/\cdots}}\\
&= \frac{a}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{a^2x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}}{c}\\
&= \frac{a}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{a^2x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}}{c}\\
&= \frac{a}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{a^2x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{a\sqrt{1+a^2x^2}\,\text{Ci}\left(\tan^{-}\cdots\right.}{2c\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [A] time = 2.60, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^4c^2x^6+2\,a^2c^2x^4+c^2x^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^6 + 2*a^2*c^2*x^4 + c^2*x^2)*arcta
n(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.18, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
[Out] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^2\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x^2*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
[Out] Integral(1/(x**2*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.664 $\int \frac{1}{x^3(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=201

$$\frac{a\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{2c}+\frac{\text{Int}\left(\frac{1}{x^3\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)}{c}+\frac{a\sqrt{a^2cx^2+c}}{2c^2x\tan^{-1}(ax)^2}-\frac{a^2\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{2c\sqrt{a^2cx^2+c}}-\frac{}{2c\sqrt{}}$$

```
[Out] -1/2*a^3*x/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)-1/2*a^2/c/arctan(a*x)/(a^2*c
*x^2+c)^(1/2)-1/2*a^2*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/
2)+1/2*a*(a^2*c*x^2+c)^(1/2)/c^2/x/arctan(a*x)^2+Unintegrable(1/x^3/arctan(
a*x)^3/(a^2*c*x^2+c)^(1/2),x)/c+1/2*a*Unintegrable(1/x^2/arctan(a*x)^2/(a^2
*c*x^2+c)^(1/2),x)/c
```

Rubi [A] time = 0.88, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] -(a^3*x)/(2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) + (a*Sqrt[c + a^2*c*x^2])/
(2*c^2*x*ArcTan[a*x]^2) - a^2/(2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) - (a^2*
Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(2*c*Sqrt[c + a^2*c*x^2]) + Def
er[Int][1/(x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]/c + (a*Defer[Int][1/(
x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x])/(2*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx &= -\left(a^2\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{c}\\
&= a^4\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx+\frac{\int \frac{1}{x^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{c}-\frac{a^2\int \frac{}{x\sqrt{c+}}}{}\\
&= -\frac{a^3x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a\sqrt{c+a^2cx^2}}{2c^2x\tan^{-1}(ax)^2}+\frac{1}{2}a^3\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan}\\
&= -\frac{a^3x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a\sqrt{c+a^2cx^2}}{2c^2x\tan^{-1}(ax)^2}-\frac{a^2}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\\
&= -\frac{a^3x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a\sqrt{c+a^2cx^2}}{2c^2x\tan^{-1}(ax)^2}-\frac{a^2}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\\
&= -\frac{a^3x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a\sqrt{c+a^2cx^2}}{2c^2x\tan^{-1}(ax)^2}-\frac{a^2}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}\\
&= -\frac{a^3x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a\sqrt{c+a^2cx^2}}{2c^2x\tan^{-1}(ax)^2}-\frac{a^2}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}
\end{aligned}$$

Mathematica [A] time = 3.33, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(a x)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2 c x^2+c}}{\left(a^4 c^2 x^7+2\,a^2 c^2 x^5+c^2 x^3\right) \arctan\left(a x\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^7 + 2*a^2*c^2*x^5 + c^2*x^3)*arcta
n(a*x)^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.26, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \left(a^2 c\, x^2+c\right)^{\frac{3}{2}} \arctan\left(a x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2 c x^2+c\right)^{\frac{3}{2}} x^3 \arctan\left(a x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x^3*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^3\, \mathrm{atan}\left(a\,x\right)^3\, {\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^3*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3 \left(c \left(a^2 x^2 + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^3(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(x**3*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.665 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=170

$$-\frac{a^2\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)}{c}+\frac{\text{Int}\left(\frac{1}{x^4\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)}{c}+\frac{a^4x}{2c\sqrt{a^2cx^2+c}\tan^{-1}(ax)}-\frac{a^3\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax\right.}{2c\sqrt{a^2cx^2+c}}$$

```
[Out] -1/2*a^3/c/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)+1/2*a^4*x/c/arctan(a*x)/(a^2*c
*x^2+c)^(1/2)-1/2*a^3*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(1/
2)+Unintegrable(1/x^4/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/c-a^2*Unintegrab
le(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/c
```

Rubi [A] time = 0.68, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] -a^3/(2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2) + (a^4*x)/(2*c*Sqrt[c + a^2*c*
x^2]*ArcTan[a*x]) - (a^3*Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(2*c*S
qrt[c + a^2*c*x^2]) + Defer[Int][1/(x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),
 x]/c - (a^2*Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x])/c
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx &= -\left(a^2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx\right)+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{c}\\
&= a^4\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}\,dx}{c}-\frac{a^2\int \frac{1}{x^2\sqrt{c+a^2c}}}{}\\
&= -\frac{a^3}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}-\frac{1}{2}a^5\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}\,dx+\frac{\int \frac{}{x^4\sqrt{c+}}}{}\\
&= -\frac{a^3}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a^4x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{1}{2}a^4\int \frac{}{\left(c+a^2cx^2\right)}\\
&= -\frac{a^3}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a^4x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax}}{c}\\
&= -\frac{a^3}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a^4x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}+\frac{\int \frac{1}{x^4\sqrt{c+a^2cx^2}\tan^{-1}(ax}}{c}\\
&= -\frac{a^3}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2}+\frac{a^4x}{2c\sqrt{c+a^2cx^2}\tan^{-1}(ax)}-\frac{a^3\sqrt{1+a^2x^2}\,\text{Ci}\left(\text{ta}\right.}{2c\sqrt{c+a^2cx}}
\end{aligned}$$

Mathematica [A] time = 8.13, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(a x)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2 c x^2+c}}{\left(a^4 c^2 x^8+2 a^2 c^2 x^6+c^2 x^4\right) \arctan(a x)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^4*c^2*x^8 + 2*a^2*c^2*x^6 + c^2*x^4)*arcta
n(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.02, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(a^2 c\, x^2+c\right)^{\frac{3}{2}} \arctan(a x)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
[Out] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2 c x^2+c\right)^{\frac{3}{2}} x^4 \arctan(a x)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(1/((a^2*c*x^2 + c)^(3/2)*x^4*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4 \,\mathrm{atan}(a\, x)^3 \left(c\, a^2\, x^2+c\right)^{3/2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(c \left(a^2 x^2 + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^3(ax)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(x**4*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.666 $\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=241

$$\frac{\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^3},x\right)}{a^4c^2}+\frac{7\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{8a^6c^2\sqrt{a^2cx^2+c}}-\frac{9\sqrt{a^2x^2+1}\,\text{Si}\left(3\tan^{-1}(ax)\right)}{8a^6c^2\sqrt{a^2cx^2+c}}+\frac{2}{a^6c^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}$$

```
[Out] 1/2*x^3/a^3/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2-3/2/a^6/c/(a^2*c*x^2+c)^(3/
2)/arctan(a*x)+1/2*x/a^5/c^2/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)+2/a^6/c^2/ar
ctan(a*x)/(a^2*c*x^2+c)^(1/2)+7/8*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^6/c^2
/(a^2*c*x^2+c)^(1/2)-9/8*Si(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^6/c^2/(a^2*c
*x^2+c)^(1/2)+Unintegrable(x/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/a^4/c^2
```

Rubi [A] time = 1.36, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] x^3/(2*a^3*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) + x/(2*a^5*c^2*Sqrt[c + a
^2*c*x^2]*ArcTan[a*x]^2) - 3/(2*a^6*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) +
2/(a^6*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) + (7*Sqrt[1 + a^2*x^2]*SinInteg
ral[ArcTan[a*x]])/(8*a^6*c^2*Sqrt[c + a^2*c*x^2]) - (9*Sqrt[1 + a^2*x^2]*Si
nIntegral[3*ArcTan[a*x]])/(8*a^6*c^2*Sqrt[c + a^2*c*x^2]) + Defer[Int][x/(S
qrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]/(a^4*c^2)
```

Rubi steps

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx = -\frac{\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx}{a^2} + \frac{\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx}{a^2c}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx}{2a^3} + \frac{\int \frac{x}{\sqrt{c+a^2cx^2}\,\tan^{-1}(a}}{a^4c^2}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{x}{2a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} + \frac{3\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}}}{2a^5}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{x}{2a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{}{2a^6c\left(c+a^2cx\right.}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{x}{2a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{}{2a^6c\left(c+a^2cx\right.}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{x}{2a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{}{2a^6c\left(c+a^2cx\right.}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{x}{2a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{}{2a^6c\left(c+a^2cx\right.}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{x}{2a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{}{2a^6c\left(c+a^2cx\right.}$$

$$= \frac{x^3}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{x}{2a^5c^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^2} - \frac{}{2a^6c\left(c+a^2cx\right.}$$

Mathematica [A] time = 8.15, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x^5/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^5}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^5/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 6.64, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}} \arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

```
[Out] int(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2cx^2+c\right)^{\frac{5}{2}} \arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(x^5/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^5/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}} \operatorname{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
```

```
[Out] Integral(x**5/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.667 $\int \frac{x^4}{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=235

$$\frac{\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3},x\right)}{a^4c^2}+\frac{5\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{8a^5c^2\sqrt{a^2cx^2+c}}-\frac{9\sqrt{a^2x^2+1}\,\text{Ci}\left(3\tan^{-1}(ax)\right)}{8a^5c^2\sqrt{a^2cx^2+c}}+\frac{1}{a^5c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}$$

```
[Out] -1/2/a^5/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2+3/2*x/a^4/c/(a^2*c*x^2+c)^(3/2
)/arctan(a*x)+1/a^5/c^2/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)-x/a^4/c^2/arctan(
a*x)/(a^2*c*x^2+c)^(1/2)+5/8*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2
*c*x^2+c)^(1/2)-9/8*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^5/c^2/(a^2*c*x^2+
c)^(1/2)+Unintegrable(1/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/a^4/c^2
```

Rubi [A] time = 1.44, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a^5*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) + 1/(a^5*c^2*Sqrt[c + a^2*
c*x^2]*ArcTan[a*x]^2) + (3*x)/(2*a^4*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) -
 x/(a^4*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) + (5*Sqrt[1 + a^2*x^2]*CosInte
gral[ArcTan[a*x]])/(8*a^5*c^2*Sqrt[c + a^2*c*x^2]) - (9*Sqrt[1 + a^2*x^2]*C
osIntegral[3*ArcTan[a*x]])/(8*a^5*c^2*Sqrt[c + a^2*c*x^2]) + Defer[Int][1/(
Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]/(a^4*c^2)
```

Rubi steps

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}dx = -\frac{\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}dx}{a^2} + \frac{\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}dx}{a^2c}$$

$$= \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}dx}{a^4} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^3}dx}{a^4c^2} - 2\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}d}{a^4c}$$

$$= -\frac{1}{2a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}dx}{2a^3} + \frac{\int \frac{1}{\sqrt{c+a^2cx^2}\tan}}{a^4c^2}$$

$$= -\frac{1}{2a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3\int \frac{}{(c+a^2c}}{}$$

$$= -\frac{1}{2a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\int \frac{}{\sqrt{c+a^2cx}}}{}$$

$$= -\frac{1}{2a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{\int \frac{}{\sqrt{c+a^2cx}}}{}$$

$$= -\frac{1}{2a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - 2\left(-\frac{}{2a^5c}\right.$$

$$= -\frac{1}{2a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - 2\left(-\frac{}{2a^5c}\right.$$

$$= -\frac{1}{2a^5c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3\sqrt{1+a^2}}{8a^5c}$$

Mathematica [A] time = 7.67, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^4}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^4/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.83, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c\, x^2+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
[Out] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c x^2+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(x^4/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4}{\mathrm{atan}\left(a\, x\right)^3 \left(c\, a^2\, x^2+c\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^4/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c \left(a^2 x^2+1\right)\right)^{\frac{5}{2}} \operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
[Out] Integral(x**4/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.668 $\int \frac{x^3}{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=180

$$-\frac{x^3}{2ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^2}-\frac{3\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{8a^4c^2\sqrt{a^2cx^2+c}}+\frac{9\sqrt{a^2x^2+1}\,\text{Si}\left(3\tan^{-1}(ax)\right)}{8a^4c^2\sqrt{a^2cx^2+c}}-\frac{3}{2a^4c^2\sqrt{a^2cx^2+c}\ \text{ta}}$$

```
[Out] -1/2*x^3/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2+3/2/a^4/c/(a^2*c*x^2+c)^(3/2
)/arctan(a*x)-3/2/a^4/c^2/arctan(a*x)/(a^2*c*x^2+c)^(1/2)-3/8*Si(arctan(a*x
))*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)+9/8*Si(3*arctan(a*x))*(a^2
*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.71, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4942, 4964, 4902, 4971, 4970, 3299, 4406}

$$-\frac{3\sqrt{a^2x^2+1}\,\text{Si}\left(\tan^{-1}(ax)\right)}{8a^4c^2\sqrt{a^2cx^2+c}}+\frac{9\sqrt{a^2x^2+1}\,\text{Si}\left(3\tan^{-1}(ax)\right)}{8a^4c^2\sqrt{a^2cx^2+c}}-\frac{3}{2a^4c^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)}-\frac{x^3}{2ac\left(a^2cx^2+c\right)^{3/2}\ \text{tan}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] -x^3/(2*a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) + 3/(2*a^4*c*(c + a^2*c*x^
2)^(3/2)*ArcTan[a*x]) - 3/(2*a^4*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) - (3*
Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(8*a^4*c^2*Sqrt[c + a^2*c*x^2])
 + (9*Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/(8*a^4*c^2*Sqrt[c + a^2
*c*x^2])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx = -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}+\frac{3\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx}{2a}$$

$$= -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}-\frac{3\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx}{2a^3}+\frac{3\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan}}{2a^3c}$$

$$= -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}+\frac{3}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{}{2a^4c^2\sqrt{c+a^2}}$$

$$= -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}+\frac{3}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{}{2a^4c^2\sqrt{c+a^2}}$$

$$= -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}+\frac{3}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{}{2a^4c^2\sqrt{c+a^2}}$$

$$= -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}+\frac{3}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{}{2a^4c^2\sqrt{c+a^2}}$$

$$= -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}+\frac{3}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{}{2a^4c^2\sqrt{c+a^2}}$$

$$= -\frac{x^3}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2}+\frac{3}{2a^4c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)}-\frac{}{2a^4c^2\sqrt{c+a^2}}$$

Mathematica [A] time = 0.33, size = 114, normalized size = 0.63

$$\frac{-3\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\text{Si}\left(\tan^{-1}(ax)\right)+9\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\text{Si}\left(3\tan^{-1}(ax)\right)-4a^2x^2\left(ax+3\tan^{-1}(a\right.}{8a^4c^2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

[In] Integrate[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]

[Out] (-4*a^2*x^2*(a*x + 3*ArcTan[a*x]) - 3*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2*Sin Integral[ArcTan[a*x]] + 9*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2*SinIntegral[3*A rcTan[a*x]])/(8*a^4*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^3}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*x^3/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3* x^2 + c^3)*arctan(a*x)^3), x)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [C] time = 3.61, size = 848, normalized size = 4.71

$$i\left(9\,\text{Ei}\left(1,-3i\arctan\left(ax\right)\right)\arctan\left(ax\right)^2x^4a^4-3\sqrt{a^2x^2+1}\;\arctan\left(ax\right)x^3a^3+18\,\text{Ei}\left(1,-3i\arctan\left(ax\right)\right)\arctan\right.$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)

[Out] 1/16*I*(9*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2*x^4*a^4-3*(a^2*x^2+1)^(1/2)* arctan(a*x)*x^3*a^3+18*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+I*(a^2* x^2+1)^(1/2)*x^3*a^3+3*(a^2*x^2+1)^(1/2)*x^2*a^2+9*I*(a^2*x^2+1)^(1/2)*arct an(a*x)*x^2*a^2+9*(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a-3*I*(a^2*x^2+1)^(1/2)*x *a+9*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2-3*I*(a^2*x^2+1)^(1/2)*arctan(a*x) -(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*x^4+2* a^2*x^2+1)/arctan(a*x)^2/c^3/a^4-1/16*I*(9*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*x^4*a^4-3*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^3*a^3+18*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*x^2*a^2-I*(a^2*x^2+1)^(1/2)*x^3*a^3+3*(a^2*x^2+1)^(1/2)*x^2 *a^2-9*I*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^2*a^2+9*(a^2*x^2+1)^(1/2)*arctan(a *x)*x*a+9*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2+3*I*(a^2*x^2+1)^(1/2)*x*a-(a^ 2*x^2+1)^(1/2)+3*I*(a^2*x^2+1)^(1/2)*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x -I)*(I+a*x))^(1/2)/(a^4*x^4+2*a^2*x^2+1)/arctan(a*x)^2/c^3/a^4+3/16*I*(Ei(1

```
,I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+I*(
a^2*x^2+1)^(1/2)*x*a+Ei(1,I*arctan(a*x))*arctan(a*x)^2+I*(a^2*x^2+1)^(1/2)*
arctan(a*x)-(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/
arctan(a*x)^2/c^3/a^4-3/16*I*(Ei(1,-I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+(a
^2*x^2+1)^(1/2)*arctan(a*x)*x*a+Ei(1,-I*arctan(a*x))*arctan(a*x)^2-I*(a^2*x
^2+1)^(1/2)*x*a-(a^2*x^2+1)^(1/2)-I*(a^2*x^2+1)^(1/2)*arctan(a*x))/(a^2*x^2
+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)^2/c^3/a^4
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(x^3/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^3/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.669 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=209

$$\frac{x}{2a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}-\frac{3x}{2a^2c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}-\frac{\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(\tan^{-1}(ax)\right)}{8a^3c^2\sqrt{a^2cx^2+c}}+\frac{9\sqrt{a^2x^2+1}\,\mathrm{Ci}\left(3\tan^{-1}(ax)\right)}{8a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/2/a^3/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2-3/2*x/a^2/c/(a^2*c*x^2+c)^(3/2)
/arctan(a*x)-1/2/a^3/c^2/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)+1/2*x/a^2/c^2/ar
ctan(a*x)/(a^2*c*x^2+c)^(1/2)-1/8*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a^3/c^2
/(a^2*c*x^2+c)^(1/2)+9/8*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c
*x^2+c)^(1/2)
```

Rubi [A] time = 0.91, antiderivative size = 209, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4964, 4902, 4942, 4905, 4904, 3302, 4968, 4971, 4970, 4406, 3312}

$$-\frac{\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(\tan^{-1}(ax)\right)}{8a^3c^2\sqrt{a^2cx^2+c}}+\frac{9\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(3\tan^{-1}(ax)\right)}{8a^3c^2\sqrt{a^2cx^2+c}}+\frac{x}{2a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}-$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] 1/(2*a^3*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) - 1/(2*a^3*c^2*Sqrt[c + a^2
*c*x^2]*ArcTan[a*x]^2) - (3*x)/(2*a^2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x])
+ x/(2*a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) - (Sqrt[1 + a^2*x^2]*CosInt
egral[ArcTan[a*x]])/(8*a^3*c^2*Sqrt[c + a^2*c*x^2]) + (9*Sqrt[1 + a^2*x^2]*
CosIntegral[3*ArcTan[a*x]])/(8*a^3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}dx = -\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}dx}{a^2} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}dx}{a^2c}$$

$$= \frac{1}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^3c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} + \frac{3\int \frac{}{\left(c+a^2cx^2\right.}}{}$$

$$= \frac{1}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^3c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{}{2a^2c\left(c+a^2\right.}$$

$$= \frac{1}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^3c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{}{2a^2c\left(c+a^2\right.}$$

$$= \frac{1}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^3c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{}{2a^2c\left(c+a^2\right.}$$

$$= \frac{1}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^3c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{}{2a^2c\left(c+a^2\right.}$$

$$= \frac{1}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^3c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{}{2a^2c\left(c+a^2\right.}$$

$$= \frac{1}{2a^3c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^3c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{}{2a^2c\left(c+a^2\right.}$$

Mathematica [A] time = 0.24, size = 119, normalized size = 0.57

$$\frac{-\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\text{Ci}\left(\tan^{-1}(ax)\right)+9\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\text{Ci}\left(3\tan^{-1}(ax)\right)+4ax\left(\left(a^2x^2-2\right)\tan^{-1}\right.}{8a^3c^2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] (4*a*x*(-(a*x) + (-2 + a^2*x^2)*ArcTan[a*x]) - (1 + a^2*x^2)^(3/2)*ArcTan[a
*x]^2*CosIntegral[ArcTan[a*x]] + 9*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2*CosInt
egral[3*ArcTan[a*x]])/(8*a^3*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a
*x]^2)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^2}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^2/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 3.33, size = 844, normalized size = 4.04

$$-\frac{\left(9\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}x^{4}a^{4}-3\sqrt{a^{2}x^{2}+1}\,\arctan\left(ax\right)x^{3}a^{3}+18\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

```
[Out] -1/16*(9*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*x^4*a^4-3*(a^2*x^2+1)^(1/2)*ar
ctan(a*x)*x^3*a^3+18*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*x^2*a^2-I*(a^2*x^2
+1)^(1/2)*x^3*a^3+3*(a^2*x^2+1)^(1/2)*x^2*a^2-9*I*(a^2*x^2+1)^(1/2)*arctan(
a*x)*x^2*a^2+9*(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+9*Ei(1,3*I*arctan(a*x))*ar
ctan(a*x)^2+3*I*(a^2*x^2+1)^(1/2)*x*a-(a^2*x^2+1)^(1/2)+3*I*(a^2*x^2+1)^(1/
2)*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*x^4+2*a^2*
x^2+1)/arctan(a*x)^2/c^3/a^3-1/16*(9*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2*x
^4*a^4-3*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^3*a^3+18*Ei(1,-3*I*arctan(a*x))*ar
ctan(a*x)^2*x^2*a^2+I*(a^2*x^2+1)^(1/2)*x^3*a^3+3*(a^2*x^2+1)^(1/2)*x^2*a^2
+9*I*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^2*a^2+9*(a^2*x^2+1)^(1/2)*arctan(a*x)*
x*a-3*I*(a^2*x^2+1)^(1/2)*x*a+9*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2-3*I*(a
^2*x^2+1)^(1/2)*arctan(a*x)-(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)
*(I+a*x))^(1/2)/(a^4*x^4+2*a^2*x^2+1)/arctan(a*x)^2/c^3/a^3+1/16*(Ei(1,I*ar
ctan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+I*(a^2*x
^2+1)^(1/2)*x*a+Ei(1,I*arctan(a*x))*arctan(a*x)^2+I*(a^2*x^2+1)^(1/2)*arcta
n(a*x)-(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arcta
n(a*x)^2/c^3/a^3+1/16*(Ei(1,-I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+
1)^(1/2)*arctan(a*x)*x*a+Ei(1,-I*arctan(a*x))*arctan(a*x)^2-I*(a^2*x^2+1)^(
1/2)*x*a-(a^2*x^2+1)^(1/2)-I*(a^2*x^2+1)^(1/2)*arctan(a*x))/(a^2*x^2+1)^(3/
2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)^2/c^3/a^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(x^2/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^3(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.670 $\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=175

$$-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{8a^2c^2\sqrt{a^2cx^2+c}}-\frac{9\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{8a^2c^2\sqrt{a^2cx^2+c}}+\frac{1}{a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}-\frac{x}{2ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

```
[Out] -1/2*x/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2-3/2/a^2/c/(a^2*c*x^2+c)^(3/2)/
arctan(a*x)+1/a^2/c^2/arctan(a*x)/(a^2*c*x^2+c)^(1/2)-1/8*Si(arctan(a*x))*(
a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)-9/8*Si(3*arctan(a*x))*(a^2*x^2
+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.93, antiderivative size = 175, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4968, 4964, 4902, 4971, 4970, 3299, 4406}

$$-\frac{\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{8a^2c^2\sqrt{a^2cx^2+c}}-\frac{9\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{8a^2c^2\sqrt{a^2cx^2+c}}+\frac{1}{a^2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}-\frac{x}{2ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] -x/(2*a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) - 3/(2*a^2*c*(c + a^2*c*x^2)
^(3/2)*ArcTan[a*x]) + 1/(a^2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) - (Sqrt[1
 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(8*a^2*c^2*Sqrt[c + a^2*c*x^2]) - (9*
Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/(8*a^2*c^2*Sqrt[c + a^2*c*x^2
])
```

Rule 3299

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[SinInte
gral[e + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*e - c*f, 0]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4964

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_)*((d_) + (e_.)*(x_)^2
)^(q_), x_Symbol] :> Dist[1/e, Int[x^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*Arc
Tan[c*x])^p, x], x] - Dist[d/e, Int[x^(m - 2)*(d + e*x^2)^q*(a + b*ArcTan[c
*x])^p, x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && IntegersQ[p
, 2*q] && LtQ[q, -1] && IGtQ[m, 1] && NeQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx = -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx}{2a} - a\int \frac{}{\left(c+a^2cx^2\right.}$$

$$= -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3}{2}\int \frac{}{\left(c+\right.}$$

$$= -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3}{2a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{}{a^2c^2\sqrt{c+}}$$

$$= -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3}{2a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{}{a^2c^2\sqrt{c+}}$$

$$= -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3}{2a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{}{a^2c^2\sqrt{c+}}$$

$$= -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3}{2a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{}{a^2c^2\sqrt{c+}}$$

$$= -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3}{2a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{}{a^2c^2\sqrt{c+}}$$

$$= -\frac{x}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{3}{2a^2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} + \frac{}{a^2c^2\sqrt{c+}}$$

Mathematica [A] time = 0.30, size = 118, normalized size = 0.67

$$\frac{-\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\mathrm{Si}\left(\tan^{-1}(ax)\right)-9\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\mathrm{Si}\left(3\tan^{-1}(ax)\right)+8a^2x^2\tan^{-1}(ax)-4ax-4}{8a^2c^2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] (-4*a*x - 4*ArcTan[a*x] + 8*a^2*x^2*ArcTan[a*x] - (1 + a^2*x^2)^(3/2)*ArcTa
n[a*x]^2*SinIntegral[ArcTan[a*x]] - 9*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2*Sin
Integral[3*ArcTan[a*x]])/(8*a^2*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTa
n[a*x]^2)
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^
2 + c^3)*arctan(a*x)^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [C] time = 1.30, size = 867, normalized size = 4.95

$$-\frac{i\left(\mathrm{Ei}\left(1,-i\arctan\left(ax\right)\right)\arctan\left(ax\right)^2x^2a^2+\sqrt{a^2x^2+1}\,\arctan\left(ax\right)xa+\mathrm{Ei}\left(1,-i\arctan\left(ax\right)\right)\arctan\left(ax\right)^2-i\sqrt{a}\right.}{16\arctan\left(ax\right)^2\left(a^4x^4+2a^2x^2+1\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

```
[Out] -1/16*I*(Ei(1,-I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arcta
n(a*x)*x*a+Ei(1,-I*arctan(a*x))*arctan(a*x)^2-I*(a^2*x^2+1)^(1/2)*x*a-(a^2*
x^2+1)^(1/2)-I*(a^2*x^2+1)^(1/2)*arctan(a*x))*(a^2*x^2+1)^(1/2)*(c*(a*x-I)*
(I+a*x))^(1/2)/arctan(a*x)^2/(a^4*x^4+2*a^2*x^2+1)/c^3/a^2-1/16*I*(9*Ei(1,-
3*I*arctan(a*x))*arctan(a*x)^2*x^4*a^4-3*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^3*
a^3+18*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+I*(a^2*x^2+1)^(1/2)*x^3
*a^3+3*(a^2*x^2+1)^(1/2)*x^2*a^2+9*I*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^2*a^2+
9*(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a-3*I*(a^2*x^2+1)^(1/2)*x*a+9*Ei(1,-3*I*a
rctan(a*x))*arctan(a*x)^2-3*I*(a^2*x^2+1)^(1/2)*arctan(a*x)-(a^2*x^2+1)^(1/
2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/a^2/c^3/(a^4*x^4+2*a^2*x^2+
1)/arctan(a*x)^2+1/16*I*(9*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*x^4*a^4-3*(a
^2*x^2+1)^(1/2)*arctan(a*x)*x^3*a^3+18*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*
```

```
x^2*a^2-I*(a^2*x^2+1)^(1/2)*x^3*a^3+3*(a^2*x^2+1)^(1/2)*x^2*a^2-9*I*(a^2*x^
2+1)^(1/2)*arctan(a*x)*x^2*a^2+9*(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+9*Ei(1,3
*I*arctan(a*x))*arctan(a*x)^2+3*I*(a^2*x^2+1)^(1/2)*x*a-(a^2*x^2+1)^(1/2)+3
*I*(a^2*x^2+1)^(1/2)*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/
2)/a^2/c^3/(a^4*x^4+2*a^2*x^2+1)/arctan(a*x)^2+1/16*I*(Ei(1,I*arctan(a*x))*
arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+I*(a^2*x^2+1)^(1/2)
*x*a+Ei(1,I*arctan(a*x))*arctan(a*x)^2+I*(a^2*x^2+1)^(1/2)*arctan(a*x)-(a^2
*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x)^2/c^
3/a^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^2cx^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(x/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
[Out] Integral(x/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.671 $\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=145

$$-\frac{3\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{8ac^2\sqrt{a^2cx^2+c}}-\frac{9\sqrt{a^2x^2+1}\,\text{Ci}\left(3\tan^{-1}(ax)\right)}{8ac^2\sqrt{a^2cx^2+c}}+\frac{3x}{2c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}-\frac{1}{2ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}}$$

```
[Out] -1/2/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2+3/2*x/c/(a^2*c*x^2+c)^(3/2)/arct
an(a*x)-3/8*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)-9/8
*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.55, antiderivative size = 145, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4902, 4968, 4971, 4970, 4406, 3302, 4905, 4904, 3312}

$$-\frac{3\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(\tan^{-1}(ax)\right)}{8ac^2\sqrt{a^2cx^2+c}}-\frac{9\sqrt{a^2x^2+1}\,\text{CosIntegral}\left(3\tan^{-1}(ax)\right)}{8ac^2\sqrt{a^2cx^2+c}}+\frac{3x}{2c\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)}-\frac{}{2ac}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] -1/(2*a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) + (3*x)/(2*c*(c + a^2*c*x^2)
^(3/2)*ArcTan[a*x]) - (3*Sqrt[1 + a^2*x^2]*CosIntegral[ArcTan[a*x]])/(8*a*c
^2*Sqrt[c + a^2*c*x^2]) - (9*Sqrt[1 + a^2*x^2]*CosIntegral[3*ArcTan[a*x]])/
(8*a*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3302

```
Int[sin[(e_.) + (f_.)*(x_)]/((c_.) + (d_.)*(x_)), x_Symbol] :> Simp[CosInte
gral[e - Pi/2 + f*x]/d, x] /; FreeQ[{c, d, e, f}, x] && EqQ[d*(e - Pi/2) -
c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
```

```
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx = -\frac{1}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2}(3a)\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx$$

$$= -\frac{1}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3}{2}\int \frac{}{\left(c+a^2cx^2\right.}$$

$$= -\frac{1}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{\left(3\sqrt{1+a^2x^2}\right)}{2c^2}$$

$$= -\frac{1}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{\left(3\sqrt{1+a^2x^2}\right)}{}$$

$$= -\frac{1}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{\left(3\sqrt{1+a^2x^2}\right)}{}$$

$$= -\frac{1}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{\left(3\sqrt{1+a^2x^2}\right)}{}$$

$$= -\frac{1}{2ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{3x}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)} - \frac{3\sqrt{1+a^2x^2}\,\mathrm{Ci}}{8ac^2\sqrt{c+}}$$

Mathematica [A] time = 0.22, size = 102, normalized size = 0.70

$$\frac{-3\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\mathrm{Ci}\left(\tan^{-1}(ax)\right)-9\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\mathrm{Ci}\left(3\tan^{-1}(ax)\right)+12ax\tan^{-1}(ax)-4}{8c^2\left(a^3x^2+a\right)\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] (-4 + 12*a*x*ArcTan[a*x] - 3*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2*CosIntegral[
ArcTan[a*x]] - 9*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2*CosIntegral[3*ArcTan[a*x
]])/(8*c^2*(a + a^3*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2
+ c^3)*arctan(a*x)^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.79, size = 844, normalized size = 5.82

$$\frac{\left(9\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)^{2}x^{4}a^{4}-3\sqrt{a^{2}x^{2}+1}\ \arctan\left(ax\right)x^{3}a^{3}+18\,\mathrm{Ei}\left(1,3i\arctan\left(ax\right)\right)\arctan\left(ax\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

```
[Out] 1/16*(9*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*x^4*a^4-3*(a^2*x^2+1)^(1/2)*arc
tan(a*x)*x^3*a^3+18*Ei(1,3*I*arctan(a*x))*arctan(a*x)^2*x^2*a^2-I*(a^2*x^2+
1)^(1/2)*x^3*a^3+3*(a^2*x^2+1)^(1/2)*x^2*a^2-9*I*(a^2*x^2+1)^(1/2)*arctan(a
*x)*x^2*a^2+9*(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+9*Ei(1,3*I*arctan(a*x))*arc
tan(a*x)^2+3*I*(a^2*x^2+1)^(1/2)*x*a-(a^2*x^2+1)^(1/2)+3*I*(a^2*x^2+1)^(1/2
)*arctan(a*x))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I+a*x))^(1/2)/(a^4*x^4+2*a^2*x
^2+1)/arctan(a*x)^2/a/c^3+1/16*(9*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2*x^4*
a^4-3*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^3*a^3+18*Ei(1,-3*I*arctan(a*x))*arcta
n(a*x)^2*x^2*a^2+I*(a^2*x^2+1)^(1/2)*x^3*a^3+3*(a^2*x^2+1)^(1/2)*x^2*a^2+9*
I*(a^2*x^2+1)^(1/2)*arctan(a*x)*x^2*a^2+9*(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a
-3*I*(a^2*x^2+1)^(1/2)*x*a+9*Ei(1,-3*I*arctan(a*x))*arctan(a*x)^2-3*I*(a^2*
x^2+1)^(1/2)*arctan(a*x)-(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(1/2)*(c*(a*x-I)*(I
+a*x))^(1/2)/(a^4*x^4+2*a^2*x^2+1)/arctan(a*x)^2/a/c^3+3/16*(Ei(1,I*arctan(
a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2)*arctan(a*x)*x*a+I*(a^2*x^2+1)
^(1/2)*x*a+Ei(1,I*arctan(a*x))*arctan(a*x)^2+I*(a^2*x^2+1)^(1/2)*arctan(a*x
)-(a^2*x^2+1)^(1/2))/(a^2*x^2+1)^(3/2)*(c*(a*x-I)*(I+a*x))^(1/2)/arctan(a*x
)^2/a/c^3+3/16*(Ei(1,-I*arctan(a*x))*arctan(a*x)^2*x^2*a^2+(a^2*x^2+1)^(1/2
)*arctan(a*x)*x*a+Ei(1,-I*arctan(a*x))*arctan(a*x)^2-I*(a^2*x^2+1)^(1/2)*x*
a-(a^2*x^2+1)^(1/2)-I*(a^2*x^2+1)^(1/2)*arctan(a*x))/(a^2*x^2+1)^(3/2)*(c*(
a*x-I)*(I+a*x))^(1/2)/arctan(a*x)^2/a/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{3}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^{3}{\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.672 $\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=263

$$-\frac{\operatorname{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^2},x\right)}{2ac^2}-\frac{\sqrt{a^2cx^2+c}}{2ac^3x\tan^{-1}(ax)^2}+\frac{5\sqrt{a^2x^2+1}\,\mathrm{Si}\left(\tan^{-1}(ax)\right)}{8c^2\sqrt{a^2cx^2+c}}+\frac{9\sqrt{a^2x^2+1}\,\mathrm{Si}\left(3\tan^{-1}(ax)\right)}{8c^2\sqrt{a^2cx^2+c}}+\frac{}{2c}$$

```
[Out] 1/2*a*x/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2+3/2/c/(a^2*c*x^2+c)^(3/2)/arcta
n(a*x)+1/2*a*x/c^2/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)-1/2/c^2/arctan(a*x)/(a
^2*c*x^2+c)^(1/2)+5/8*Si(arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(
1/2)+9/8*Si(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-1/2*(a
^2*c*x^2+c)^(1/2)/a/c^3/x/arctan(a*x)^2-1/2*Unintegrable(1/x^2/arctan(a*x)^
2/(a^2*c*x^2+c)^(1/2),x)/a/c^2
```

Rubi [A] time = 1.72, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] (a*x)/(2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) + (a*x)/(2*c^2*Sqrt[c + a^2
*c*x^2]*ArcTan[a*x]^2) - Sqrt[c + a^2*c*x^2]/(2*a*c^3*x*ArcTan[a*x]^2) + 3/
(2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) - 1/(2*c^2*Sqrt[c + a^2*c*x^2]*ArcT
an[a*x]) + (5*Sqrt[1 + a^2*x^2]*SinIntegral[ArcTan[a*x]])/(8*c^2*Sqrt[c + a
^2*c*x^2]) + (9*Sqrt[1 + a^2*x^2]*SinIntegral[3*ArcTan[a*x]])/(8*c^2*Sqrt[c
 + a^2*c*x^2]) - Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^2), x]/(
2*a*c^2)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx = -\left(a^2\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx\right) + \frac{\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx}{c}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} - \frac{1}{2}a\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^2}\,dx + a^3\int \frac{}{(c}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{ax}{2c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{\sqrt{c+a^2cx^2}}{2ac^3x\tan^{-1}(ax)^2}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{ax}{2c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{\sqrt{c+a^2cx^2}}{2ac^3x\tan^{-1}(ax)^2}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{ax}{2c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{\sqrt{c+a^2cx^2}}{2ac^3x\tan^{-1}(ax)^2}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{ax}{2c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{\sqrt{c+a^2cx^2}}{2ac^3x\tan^{-1}(ax)^2}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{ax}{2c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{\sqrt{c+a^2cx^2}}{2ac^3x\tan^{-1}(ax)^2}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{ax}{2c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{\sqrt{c+a^2cx^2}}{2ac^3x\tan^{-1}(ax)^2}$$

$$= \frac{ax}{2c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^2} + \frac{ax}{2c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^2} - \frac{\sqrt{c+a^2cx^2}}{2ac^3x\tan^{-1}(ax)^2}$$

Mathematica [A] time = 3.80, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^7+3\,a^4c^3x^5+3\,a^2c^3x^3+c^3x\right)\arctan(ax)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^7 + 3*a^4*c^3*x^5 + 3*a^2*c^3*x^3
+ c^3*x)*arctan(a*x)^3), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2}cx^{2}+c\right)^{\frac{5}{2}}x\arctan\left(ax\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{3}\,{\left(c\,a^{2}\,x^{2}+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}\operatorname{atan}^{3}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.673 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=232

$$\frac{\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^3},x\right)}{c^2}+\frac{7a\sqrt{a^2x^2+1}\,\text{Ci}\left(\tan^{-1}(ax)\right)}{8c^2\sqrt{a^2cx^2+c}}+\frac{9a\sqrt{a^2x^2+1}\,\text{Ci}\left(3\tan^{-1}(ax)\right)}{8c^2\sqrt{a^2cx^2+c}}-\frac{a^2x}{2c^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)}$$

```
[Out] 1/2*a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^2-3/2*a^2*x/c/(a^2*c*x^2+c)^(3/2)/a
rctan(a*x)+1/2*a/c^2/arctan(a*x)^2/(a^2*c*x^2+c)^(1/2)-1/2*a^2*x/c^2/arctan
(a*x)/(a^2*c*x^2+c)^(1/2)+7/8*a*Ci(arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*
c*x^2+c)^(1/2)+9/8*a*Ci(3*arctan(a*x))*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^
(1/2)+Unintegrable(1/x^2/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)/c^2
```

Rubi [A] time = 1.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] a/(2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^2) + a/(2*c^2*Sqrt[c + a^2*c*x^2]*
ArcTan[a*x]^2) - (3*a^2*x)/(2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]) - (a^2*x
)/(2*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]) + (7*a*Sqrt[1 + a^2*x^2]*CosInteg
ral[ArcTan[a*x]])/(8*c^2*Sqrt[c + a^2*c*x^2]) + (9*a*Sqrt[1 + a^2*x^2]*CosI
ntegral[3*ArcTan[a*x]])/(8*c^2*Sqrt[c + a^2*c*x^2]) + Defer[Int][1/(x^2*Sqr
t[c + a^2*c*x^2]*ArcTan[a*x]^3), x]/c^2
```

Rubi steps

$$\int \frac{1}{x^2 \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3} dx = -\left(a^2 \int \frac{1}{\left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3} dx\right) + \frac{\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^3} dx}{c}$$

$$= \frac{a}{2c\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} + \frac{1}{2}\left(3a^3\right) \int \frac{x}{\left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^2} dx +$$

$$= \frac{a}{2c\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} + \frac{a}{2c^2\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} - \frac{3a}{2c\left(c+a^2cx^2\right.}$$

$$= \frac{a}{2c\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} + \frac{a}{2c^2\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} - \frac{3a}{2c\left(c+a^2cx^2\right.}$$

$$= \frac{a}{2c\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} + \frac{a}{2c^2\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} - \frac{3a}{2c\left(c+a^2cx^2\right.}$$

$$= \frac{a}{2c\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} + \frac{a}{2c^2\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} - \frac{3a}{2c\left(c+a^2cx^2\right.}$$

$$= \frac{a}{2c\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} + \frac{a}{2c^2\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} - \frac{3a}{2c\left(c+a^2cx^2\right.}$$

$$= \frac{a}{2c\left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^2} + \frac{a}{2c^2\sqrt{c+a^2cx^2} \tan^{-1}(ax)^2} - \frac{3a}{2c\left(c+a^2cx^2\right.}$$

Mathematica [A] time = 5.57, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}}{\left(a^6c^3x^8+3\,a^4c^3x^6+3\,a^2c^3x^4+c^3x^2\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)/((a^6*c^3*x^8 + 3*a^4*c^3*x^6 + 3*a^2*c^3*x^4
+ c^3*x^2)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{{\left(a^{2} c x^{2} + c\right)}^{\frac{5}{2}} x^{2} \arctan \left(a x\right)^{3}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] integrate(1/((a^2*c*x^2 + c)^(5/2)*x^2*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^3\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
```

```
[Out] Integral(1/(x**2*(c*(a**2*x**2 + 1))**(5/2)*atan(a*x)**3), x)
```

3.674 $\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^3,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3,x]

[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3, x]

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 0.86, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3,x]

[Out] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^3, x]

fricas [A] time = 0.65, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m/arctan(a*x
)^3, x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")

[Out] Timed out

maple [A] time = 1.82, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2 + c\right)^3}{\arctan\left(a x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
[Out] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^3,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^3}{\mathrm{atan}\left(a\, x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^3,x)
[Out] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3 \left(\int \frac{x^m}{\operatorname{atan}^3\left(a x\right)}\, dx + \int \frac{3 a^2 x^2 x^m}{\operatorname{atan}^3\left(a x\right)}\, dx + \int \frac{3 a^4 x^4 x^m}{\operatorname{atan}^3\left(a x\right)}\, dx + \int \frac{a^6 x^6 x^m}{\operatorname{atan}^3\left(a x\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3/atan(a*x)**3,x)
[Out] c**3*(Integral(x**m/atan(a*x)**3, x) + Integral(3*a**2*x**2*x**m/atan(a*x)*
*3, x) + Integral(3*a**4*x**4*x**m/atan(a*x)**3, x) + Integral(a**6*x**6*x*
*m/atan(a*x)**3, x))
```

3.675 $\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3,x]
```

```
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 0.96, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3,x]
```

```
[Out] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)x^m}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m/arctan(a*x)^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.78, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2 + c\right)^2}{\arctan \left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^2}{\mathrm{atan}\left(a\, x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^3,x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2 \left(\int \frac{x^m}{\mathrm{atan}^3\left(ax\right)}\, dx + \int \frac{2a^2x^2x^m}{\mathrm{atan}^3\left(ax\right)}\, dx + \int \frac{a^4x^4x^m}{\mathrm{atan}^3\left(ax\right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] c**2*(Integral(x**m/atan(a*x)**3, x) + Integral(2*a**2*x**2*x**m/atan(a*x)*
*3, x) + Integral(a**4*x**4*x**m/atan(a*x)**3, x))
```

3.676 $\int \frac{x^m(c+a^2cx^2)}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^3,x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 0.63, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^3,x]
[Out] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)x^m}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m/arctan(a*x)^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.50, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)}{\arctan \left(a x \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^3,x)
[Out] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
[Out] Timed out
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2))/atan(a*x)^3,x)
[Out] int((x^m*(c + a^2*c*x^2))/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x^{m}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{2} x^{m}}{\operatorname{atan}^{3}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)/atan(a*x)**3,x)
[Out] c*(Integral(x**m/atan(a*x)**3, x) + Integral(a**2*x**2*x**m/atan(a*x)**3, x
))
```

3.677 $\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=46

$$\frac{m\text{Int}\left(\frac{x^{m-1}}{\tan^{-1}(ax)^2},x\right)}{2ac}-\frac{x^m}{2ac\tan^{-1}(ax)^2}$$

```
[Out] -1/2*x^m/a/c/arctan(a*x)^2+1/2*m*Unintegrable(x^(-1+m)/arctan(a*x)^2,x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] -x^m/(2*a*c*ArcTan[a*x]^2) + (m*Defer[Int][x^(-1 + m)/ArcTan[a*x]^2, x])/(2
*a*c)
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx=-\frac{x^m}{2ac\tan^{-1}(ax)^2}+\frac{m\int \frac{x^{-1+m}}{\tan^{-1}(ax)^2}\,dx}{2ac}$$

Mathematica [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^2cx^2+c\right)\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(x^m/((a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="giac")
```

[Out] Timed out

maple [A] time = 0.52, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right) \arctan\left(a x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{sage_0 x^2 \arctan\left(ax\right)^2 - axx^m - \left(a^2 m x^2 + m\right) x^m \arctan\left(ax\right)}{2\, a^2 c x \arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(x*arctan(a*x)^2*integrate(((a^2*m^2 + a^2*m)*x^2 + m^2 - m)*x^m/(x^2*a
rctan(a*x)), x) - a*x*x^m - (a^2*m*x^2 + m)*x^m*arctan(a*x))/(a^2*c*x*arcta
n(a*x)^2)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^m}{\mathrm{atan}\left(a\, x\right)^3\, \left(c\, a^2\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m}{a^2 x^2 \operatorname{atan}^3\left(ax\right) + \operatorname{atan}^3\left(ax\right)}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)/atan(a*x)**3,x)
```

```
[Out] Integral(x**m/(a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x)/c
```

3.678 $\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^2 \tan^{-1}(ax)^3},x\right)$$

[Out] Unintegrable(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]

[Out] Defer[Int][x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^3), x]

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3} \, dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3} \, dx$$

Mathematica [A] time = 1.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^3),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^3), x]

fricas [A] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral(x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^3), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="giac")

[Out] Timed out

maple [A] time = 1.57, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2c\,x^2+c\right)^2 \arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(a^4c^2x^3+a^2c^2x\right)\arctan\left(ax\right)^2\int \frac{\left(\left(a^4m^2-3\,a^4m+2\,a^4\right)x^4+2\left(a^2m^2-2\,a^2m-a^2\right)x^2+m^2-m\right)x^m}{\left(a^6c^2x^6+2\,a^4c^2x^4+a^2c^2x^2\right)\arctan(ax)}\,dx-axx^m-\left(\left(a^2m-2\,a^2\right)x^2+m\right)x}{2\left(a^4c^2x^3+a^2c^2x\right)\arctan\left(ax\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^3,x, algorithm="maxima")
```

```
[Out] 1/2*(2*(a^4*c^2*x^3 + a^2*c^2*x)*arctan(a*x)^2*integrate(1/2*((a^4*m^2 - 3*
a^4*m + 2*a^4)*x^4 + 2*(a^2*m^2 - 2*a^2*m - a^2)*x^2 + m^2 - m)*x^m/((a^6*c
^2*x^6 + 2*a^4*c^2*x^4 + a^2*c^2*x^2)*arctan(a*x)), x) - a*x*x^m - ((a^2*m
- 2*a^2)*x^2 + m)*x^m*arctan(a*x))/((a^4*c^2*x^3 + a^2*c^2*x)*arctan(a*x)^2
)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)^3\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m}{a^4x^4\,\mathrm{atan}^3\left(ax\right)+2a^2x^2\,\mathrm{atan}^3\left(ax\right)+\mathrm{atan}^3\left(ax\right)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**2/atan(a*x)**3,x)
```

```
[Out] Integral(x**m/(a**4*x**4*atan(a*x)**3 + 2*a**2*x**2*atan(a*x)**3 + atan(a*x
)**3), x)/c**2
```

3.679 $\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)^3}, x\right)$$

[Out] Unintegrable(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]

[Out] Defer[Int][x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^3), x]

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx = \int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx$$

Mathematica [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^3),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^3), x]

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="fricas")

[Out] integral(x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^3), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="giac")

[Out] Timed out

maple [A] time = 1.93, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)

[Out] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^3,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\left(a^{6} c^{3} x^{5}+2 \, a^{4} c^{3} x^{3}+a^{2} c^{3} x\right) \arctan \left(a x\right)^{2} \int \frac{\left(\left(a^{4} m^{2}-7 \, a^{4} m+12 \, a^{4}\right) x^{4}+2 \, \left(a^{2} m^{2}-4 \, a^{2} m-2 \, a^{2}\right) x^{2}+m^{2}-m\right) x^{m}}{\left(a^{8} c^{3} x^{8}+3 \, a^{6} c^{3} x^{6}+3 \, a^{4} c^{3} x^{4}+a^{2} c^{3} x^{2}\right) \arctan\left(a x\right)}\,dx - a x x^{m} - \left(\left(a^{2} m - 4\right.\right.}{2 \, \left(a^{6} c^{3} x^{5}+2 \, a^{4} c^{3} x^{3}+a^{2} c^{3} x\right) \arctan \left(a x\right)^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^3,x, algorithm="maxima")

[Out] 1/2*(2*(a^6*c^3*x^5 + 2*a^4*c^3*x^3 + a^2*c^3*x)*arctan(a*x)^2*integrate(1/2*((a^4*m^2 - 7*a^4*m + 12*a^4)*x^4 + 2*(a^2*m^2 - 4*a^2*m - 2*a^2)*x^2 + m^2 - m)*x^m/((a^8*c^3*x^8 + 3*a^6*c^3*x^6 + 3*a^4*c^3*x^4 + a^2*c^3*x^2)*arctan(a*x)), x) - a*x*x^m - ((a^2*m - 4*a^2)*x^2 + m)*x^m*arctan(a*x))/((a^6*c^3*x^5 + 2*a^4*c^3*x^3 + a^2*c^3*x)*arctan(a*x)^2)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^3\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^3),x)

[Out] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^3), x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{6} x^{6} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{4} x^{4} \operatorname{atan}^{3}{\left(a x \right)} + 3 a^{2} x^{2} \operatorname{atan}^{3}{\left(a x \right)} + \operatorname{atan}^{3}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m/(a**2*c*x**2+c)**3/atan(a*x)**3,x)

[Out] Integral(x**m/(a**6*x**6*atan(a*x)**3 + 3*a**4*x**4*atan(a*x)**3 + 3*a**2*x**2*atan(a*x)**3 + atan(a*x)**3), x)/c**3

3.680 $\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3,x]
```

```
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.67, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3,x]
```

```
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.80, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m/arctan
(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.33, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2 + c\right)^{\frac{5}{2}}}{\arctan\left(a x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c x^2 + c\right)^{\frac{5}{2}} x^m}{\arctan\left(a x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate((a^2*c*x^2 + c)^(5/2)*x^m/arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^{5/2}}{\mathrm{atan}\left(a\, x\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^3,x)
[Out] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
[Out] Timed out
```

3.681 $\int \frac{x^m(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3,x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.37, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3,x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^m}{\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{\arctan \left(a x \right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)

[Out] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(a^{2} c x^{2} + c\right)}^{\frac{3}{2}} x^{m}}{\arctan \left(a x\right)^{3}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")

[Out] integrate((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x)^3, x)

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^3,x)

[Out] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^3, x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)

[Out] Timed out

3.682 $\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^3} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \sqrt{a^2 c x^2+c}}{\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3,x]
[Out] Defer[Int][(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3, x]
```

Rubi steps

$$\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^3} \, dx = \int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^3} \, dx$$

Mathematica [A] time = 0.73, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^3} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3,x]
[Out] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^3, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2 c x^2+c}\, x^m}{\arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x)^3, x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.44, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\sqrt{a^{2}c\,x^{2}+c}}{\arctan\left(ax\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2}cx^{2}+c}\,x^{m}}{\arctan\left(ax\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x)^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^{m}\,\sqrt{c\,a^{2}\,x^{2}+c}}{\mathrm{atan}\left(a\,x\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^3,x)
[Out] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\sqrt{c\left(a^{2}x^{2}+1\right)}}{\operatorname{atan}^{3}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)/atan(a*x)**3,x)
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))/atan(a*x)**3, x)
```

3.683 $\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\sqrt{a^2cx^2+c} \tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
[Out] Defer[Int][x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} dx = \int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} dx$$

Mathematica [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3),x]
[Out] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\sqrt{a^2cx^2+c} \arctan(ax)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.82, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\arctan \left(a x\right)^{3} \sqrt{a^{2} c \,x^{2}+c}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\sqrt{a^{2} c x^{2} + c} \arctan \left(a x\right)^{3}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] integrate(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^3\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\sqrt{c \left(a^{2} x^{2} + 1\right)} \operatorname{atan}^{3}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/atan(a*x)**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**3), x)
```

3.684 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.17, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
[Out] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2cx^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(x^m/((a^2*c*x^2 + c)^(3/2)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)^3\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^3\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(3/2)/atan(a*x)**3,x)
[Out] Integral(x**m/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**3), x)
```

3.685 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)^3},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Mathematica [A] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3),x]
```

```
[Out] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^3), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.08, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right)^{\frac{5}{2}} \arctan\left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
[Out] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c x^2 + c\right)^{\frac{5}{2}} \arctan\left(ax\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^3,x, algorithm="maxima")
[Out] integrate(x^m/((a^2*c*x^2 + c)^(5/2)*arctan(a*x)^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\, x\right)^3\, {\left(c\, a^2\, x^2 + c\right)}^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^m/(atan(a*x)^3*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(5/2)/atan(a*x)**3,x)
[Out] Timed out
```

3.686 $\int x^m \left(c+a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right) \sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx=\int x^m \left(c+a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx$$

Mathematica [A] time = 2.18, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[x^m*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right) x^m \sqrt{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m*sqrt(arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.57, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\, x^2+c\right) \sqrt{\arctan(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \sqrt{\operatorname{atan}(a\,x)}\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^m\sqrt{\operatorname{atan}(ax)}\,dx+\int a^2x^2x^m\sqrt{\operatorname{atan}(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)*atan(a*x)**(1/2),x)
```

```
[Out] c*(Integral(x**m*sqrt(atan(a*x)), x) + Integral(a**2*x**2*x**m*sqrt(atan(a*
x)), x))
```

3.687 $\int x \left(c + a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx$

Optimal. Leaf size=57

$$\frac{c\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}{4a^2}-\frac{\text{Int}\left(\frac{a^2cx^2+c}{\sqrt{\tan^{-1}(ax)}},x\right)}{8a}$$

```
[Out] 1/4*c*(a^2*x^2+1)^2*arctan(a*x)^(1/2)/a^2-1/8*Unintegrable((a^2*c*x^2+c)/ar
ctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x \left(c + a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] (c*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])/(4*a^2) - Defer[Int][(c + a^2*c*x^2)/
Sqrt[ArcTan[a*x]], x]/(8*a)
```

Rubi steps

$$\int x \left(c + a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx = \frac{c\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{4a^2}-\frac{\int \frac{c+a^2cx^2}{\sqrt{\tan^{-1}(ax)}}\, dx}{8a}$$

Mathematica [A] time = 2.49, size = 0, normalized size = 0.00

$$\int x \left(c + a^2 c x^2\right) \sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.00, size = 0, normalized size = 0.00

$$\int x\left(a^{2} c\,x^{2}+c\right)\sqrt{\arctan\left(a x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x)
[Out] int(x*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2),x)
[Out] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx+\int a^{2}x^{3}\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)*atan(a*x)**(1/2),x)
[Out] c*(Integral(x*sqrt(atan(a*x)), x) + Integral(a**2*x**3*sqrt(atan(a*x)), x))
```

3.688 $\int \left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=22

$$\mathrm{Int}\left(\left(a^2cx^2+c\right)\sqrt{\tan^{-1}(ax)},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)*arctan(a*x)^(1/2),x)

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]],x]

[Out] Defer[Int][(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]], x]

Rubi steps

$$\int \left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}\,dx=\int \left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 3.43, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]],x]

[Out] Integrate[(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]], x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \left(a^2c\,x^2+c\right)\sqrt{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2+c\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(atan(a*x)^(1/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int a^{2} x^{2} \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx + \int \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(1/2),x)
```

```
[Out] c*(Integral(a**2*x**2*sqrt(atan(a*x)), x) + Integral(sqrt(atan(a*x)), x))
```

3.689 $\int \frac{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}{x}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a^2cx^2+c)\sqrt{\tan^{-1}(ax)}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)*arctan(a*x)^(1/2)/x,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]])/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]])/x, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}{x}\,dx=\int \frac{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Mathematica [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]])/x,x]
[Out] Integrate[((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]])/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(1/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(1/2)/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.84, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right) \sqrt{\arctan \left(a x\right)}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(1/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(1/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2+c\right)}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(1/2)*(c + a^2*c*x^2))/x,x)
```

```
[Out] int((atan(a*x)^(1/2)*(c + a^2*c*x^2))/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{\sqrt{\operatorname{atan}{\left(a x \right)}}}{x}\, dx + \int a^{2} x \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(1/2)/x,x)
```

```
[Out] c*(Integral(sqrt(atan(a*x))/x, x) + Integral(a**2*x*sqrt(atan(a*x)), x))
```

3.690 $\int x^m \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^2 \sqrt{\tan^{-1}(a x)},x\right)$$

[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

[In] Int[x^m*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]],x]

[Out] Defer[Int][x^m*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]], x]

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)} \, dx=\int x^m \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)} \, dx$$

Mathematica [A] time = 1.34, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]],x]

[Out] Integrate[x^m*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]], x]

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^{4} c^{2} x^{4}+2 \, a^{2} c^{2} x^{2}+c^{2}\right) x^{m} \sqrt{\arctan\left(a x\right)}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="fricas")

[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m*sqrt(arctan(a*x)), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_{0} x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 4.50, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c \,x^{2}+c \right)^{2} \sqrt{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x^m\sqrt{\mathrm{atan}\,(ax)}\,dx+\int 2a^2x^2x^m\sqrt{\mathrm{atan}\,(ax)}\,dx+\int a^4x^4x^m\sqrt{\mathrm{atan}\,(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2*atan(a*x)**(1/2),x)
```

```
[Out] c**2*(Integral(x**m*sqrt(atan(a*x)), x) + Integral(2*a**2*x**2*x**m*sqrt(at
an(a*x)), x) + Integral(a**4*x**4*x**m*sqrt(atan(a*x)), x))
```

3.691 $\int x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=61

$$\frac{c^2\left(a^2x^2+1\right)^3\sqrt{\tan^{-1}(ax)}}{6a^2}-\frac{\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{\sqrt{\tan^{-1}(ax)}},x\right)}{12a}$$

```
[Out] 1/6*c^2*(a^2*x^2+1)^3*arctan(a*x)^(1/2)/a^2-1/12*Unintegrable((a^2*c*x^2+c)
^2/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]],x]
```

```
[Out] (c^2*(1 + a^2*x^2)^3*Sqrt[ArcTan[a*x]])/(6*a^2) - Defer[Int][(c + a^2*c*x^2
)^2/Sqrt[ArcTan[a*x]], x]/(12*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}\,dx=\frac{c^2\left(1+a^2x^2\right)^3\sqrt{\tan^{-1}(ax)}}{6a^2}-\frac{\int\frac{\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx}{12a}$$

Mathematica [A] time = 1.97, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.43, size = 0, normalized size = 0.00

$$\int x\left(a^{2}c\,x^{2}+c\right)^{2}\sqrt{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2+c\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int x\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx+\int 2a^{2}x^{3}\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx+\int a^{4}x^{5}\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2*atan(a*x)**(1/2),x)
```

```
[Out] c**2*(Integral(x*sqrt(atan(a*x)), x) + Integral(2*a**2*x**3*sqrt(atan(a*x))
, x) + Integral(a**4*x**5*sqrt(atan(a*x)), x))
```

3.692 $\int \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)}\, dx$

Optimal. Leaf size=24

$$\text{Int}\left(\left(a^2 c x^2+c\right)^2 \sqrt{\tan^{-1}(a x)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)}\, dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)}\, dx=\int \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)}\, dx$$

Mathematica [A] time = 1.85, size = 0, normalized size = 0.00

$$\int \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(a x)}\, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.69, size = 0, normalized size = 0.00

$$\int \left(a^2 c\, x^2+c\right)^2 \sqrt{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \sqrt{\operatorname{atan}(a\,x)}\,\left(c\,a^2\,x^2+c\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int 2a^2x^2\sqrt{\operatorname{atan}(ax)}\,dx+\int a^4x^4\sqrt{\operatorname{atan}(ax)}\,dx+\int \sqrt{\operatorname{atan}(ax)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(1/2),x)
```

```
[Out] c**2*(Integral(2*a**2*x**2*sqrt(atan(a*x)), x) + Integral(a**4*x**4*sqrt(at
an(a*x)), x) + Integral(sqrt(atan(a*x)), x))
```

3.693 $\int \frac{(c+a^2cx^2)^2 \sqrt{\tan^{-1}(ax)}}{x}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{(a^2cx^2+c)^2 \sqrt{\tan^{-1}(ax)}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2*arctan(a*x)^(1/2)/x,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^2 \sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]])/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]])/x, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^2 \sqrt{\tan^{-1}(ax)}}{x}\,dx = \int \frac{(c+a^2cx^2)^2 \sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Mathematica [A] time = 1.38, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^2 \sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]])/x,x]
[Out] Integrate[((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]])/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(1/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(1/2)/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.18, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{2} \sqrt{\arctan \left(a x \right)}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(1/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(1/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^2}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(1/2)*(c + a^2*c*x^2)^2)/x,x)
```

```
[Out] int((atan(a*x)^(1/2)*(c + a^2*c*x^2)^2)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{\sqrt{\operatorname{atan}{\left(a x \right)}}}{x}\, dx + \int 2 a^{2} x \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx + \int a^{4} x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(1/2)/x,x)
```

```
[Out] c**2*(Integral(sqrt(atan(a*x))/x, x) + Integral(2*a**2*x*sqrt(atan(a*x)), x
) + Integral(a**4*x**3*sqrt(atan(a*x)), x))
```

3.694 $\int x^m \left(c+a^2cx^2\right)^3 \sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2cx^2+c\right)^3 \sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2cx^2\right)^3 \sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^3 \sqrt{\tan^{-1}(ax)}\,dx=\int x^m \left(c+a^2cx^2\right)^3 \sqrt{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.89, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2cx^2\right)^3 \sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m\sqrt{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m*sqrt(arcta
n(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 5.60, size = 0, normalized size = 0.00

$$\int x^m \left(a^2c\,x^2+c\right)^3 \sqrt{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \sqrt{\operatorname{atan}(a\,x)}\,\left(c\,a^2\,x^2+c\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3*atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.695 $\int x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=61

$$\frac{c^3\left(a^2x^2+1\right)^4\sqrt{\tan^{-1}(ax)}}{8a^2}-\frac{\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3}{\sqrt{\tan^{-1}(ax)}},x\right)}{16a}$$

```
[Out] 1/8*c^3*(a^2*x^2+1)^4*arctan(a*x)^(1/2)/a^2-1/16*Unintegrable((a^2*c*x^2+c)
^3/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]],x]
```

```
[Out] (c^3*(1 + a^2*x^2)^4*Sqrt[ArcTan[a*x]])/(8*a^2) - Defer[Int][(c + a^2*c*x^2
)^3/Sqrt[ArcTan[a*x]], x]/(16*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}\,dx=\frac{c^3\left(1+a^2x^2\right)^4\sqrt{\tan^{-1}(ax)}}{8a^2}-\frac{\int\frac{\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}}\,dx}{16a}$$

Mathematica [A] time = 1.96, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.14, size = 0, normalized size = 0.00

$$\int x\left(a^2 c\,x^2+c\right)^3\sqrt{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2+c\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int x\sqrt{\operatorname{atan}\left(ax\right)}\,dx+\int 3a^2x^3\sqrt{\operatorname{atan}\left(ax\right)}\,dx+\int 3a^4x^5\sqrt{\operatorname{atan}\left(ax\right)}\,dx+\int a^6x^7\sqrt{\operatorname{atan}\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3*atan(a*x)**(1/2),x)
```

```
[Out] c**3*(Integral(x*sqrt(atan(a*x)), x) + Integral(3*a**2*x**3*sqrt(atan(a*x))
, x) + Integral(3*a**4*x**5*sqrt(atan(a*x)), x) + Integral(a**6*x**7*sqrt(a
tan(a*x)), x))
```

3.696 $\int \left(c+a^2 c x^2\right)^3 \sqrt{\tan^{-1}(ax)}\, dx$

Optimal. Leaf size=24

$$\text{Int}\left(\left(a^2 c x^2+c\right)^3 \sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2 c x^2\right)^3 \sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \left(c+a^2 c x^2\right)^3 \sqrt{\tan^{-1}(ax)}\, dx=\int \left(c+a^2 c x^2\right)^3 \sqrt{\tan^{-1}(ax)}\, dx$$

Mathematica [A] time = 1.88, size = 0, normalized size = 0.00

$$\int \left(c+a^2 c x^2\right)^3 \sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.75, size = 0, normalized size = 0.00

$$\int \left(a^2 c\,x^2+c\right)^3 \sqrt{\arctan\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \sqrt{\operatorname{atan}(a\,x)}\,{\left(c\,a^2\,x^2+c\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int 3a^{2}x^{2}\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx+\int 3a^{4}x^{4}\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx+\int a^{6}x^{6}\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx+\int\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(1/2),x)
```

```
[Out] c**3*(Integral(3*a**2*x**2*sqrt(atan(a*x)), x) + Integral(3*a**4*x**4*sqrt(
atan(a*x)), x) + Integral(a**6*x**6*sqrt(atan(a*x)), x) + Integral(sqrt(ata
n(a*x)), x))
```

3.697 $\int \frac{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}{x}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3*arctan(a*x)^(1/2)/x,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]])/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]])/x, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}{x}\,dx=\int \frac{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Mathematica [A] time = 1.41, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]])/x,x]
[Out] Integrate[((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]])/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(1/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(1/2)/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.97, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{3} \sqrt{\arctan \left(a x\right)}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(1/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(1/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^3}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(1/2)*(c + a^2*c*x^2)^3)/x,x)
```

```
[Out] int((atan(a*x)^(1/2)*(c + a^2*c*x^2)^3)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{\sqrt{\operatorname{atan}{\left(a x \right)}}}{x}\, dx + \int 3 a^{2} x \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx + \int 3 a^{4} x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx + \int a^{6} x^{5} \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(1/2)/x,x)
```

```
[Out] c**3*(Integral(sqrt(atan(a*x))/x, x) + Integral(3*a**2*x*sqrt(atan(a*x)), x
) + Integral(3*a**4*x**3*sqrt(atan(a*x)), x) + Integral(a**6*x**5*sqrt(atan
(a*x)), x))
```

3.698 $\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \sqrt{\tan^{-1}(ax)}}{a^2cx^2+c},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
[Out] Defer[Int][(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2), x]
```

Rubi steps

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} dx = \int \frac{x^m \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} dx$$

Mathematica [A] time = 0.83, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
[Out] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2), x]
```

fricas [A] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \sqrt{\arctan(ax)}}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] integral(x^m*sqrt(arctan(a*x))/(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.30, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{\arctan(ax)}}{a^2 c\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \sqrt{\mathrm{atan}(a\, x)}}{c\, a^2\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m \sqrt{\mathrm{atan}(ax)}}{a^2 x^2 + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(1/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**m*sqrt(atan(a*x))/(a**2*x**2 + 1), x)/c
```

3.699 $\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx$

Optimal. Leaf size=61

$$\frac{2\text{Int}\left(\tan^{-1}(ax)^{3/2},x\right)}{3a^3c}+\frac{\text{Int}\left(x\sqrt{\tan^{-1}(ax)},x\right)}{a^2c}-\frac{2x\tan^{-1}(ax)^{3/2}}{3a^3c}$$

```
[Out] -2/3*x*arctan(a*x)^(3/2)/a^3/c+2/3*Unintegrable(arctan(a*x)^(3/2),x)/a^3/c+
Unintegrable(x*arctan(a*x)^(1/2),x)/a^2/c
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
```

```
[Out] (-2*x*ArcTan[a*x]^(3/2))/(3*a^3*c) + Defer[Int][x*Sqrt[ArcTan[a*x]], x]/(a^
2*c) + (2*Defer[Int][ArcTan[a*x]^(3/2), x])/(3*a^3*c)
```

Rubi steps

$$\begin{aligned}\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx &= -\frac{\int \frac{x\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx}{a^2}+\frac{\int x\sqrt{\tan^{-1}(ax)}\,dx}{a^2c}\\ &= -\frac{2x\tan^{-1}(ax)^{3/2}}{3a^3c}+\frac{2\int \tan^{-1}(ax)^{3/2}\,dx}{3a^3c}+\frac{\int x\sqrt{\tan^{-1}(ax)}\,dx}{a^2c}\end{aligned}$$

Mathematica [A] time = 2.87, size = 0, normalized size = 0.00

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.70, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \sqrt{\arctan \left(a x\right)}}{a^{2} c \,x^{2}+c}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^3\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{c\,a^2\,x^2+c} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{2} x^{2} + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(1/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**3*sqrt(atan(a*x))/(a**2*x**2 + 1), x)/c
```

3.700 $\int \frac{x^2 \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} \, dx$

Optimal. Leaf size=37

$$\frac{\text{Int}\left(\sqrt{\tan^{-1}(ax)},x\right)}{a^2c}-\frac{2\tan^{-1}(ax)^{3/2}}{3a^3c}$$

```
[Out] -2/3*arctan(a*x)^(3/2)/a^3/c+Unintegrable(arctan(a*x)^(1/2),x)/a^2/c
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2 \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
[Out] (-2*ArcTan[a*x]^(3/2))/(3*a^3*c) + Defer[Int][Sqrt[ArcTan[a*x]], x]/(a^2*c)
```

Rubi steps

$$\begin{aligned}\int \frac{x^2 \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} \, dx &= -\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} \, dx}{a^2}+\frac{\int \sqrt{\tan^{-1}(ax)} \, dx}{a^2c}\\ &= -\frac{2\tan^{-1}(ax)^{3/2}}{3a^3c}+\frac{\int \sqrt{\tan^{-1}(ax)} \, dx}{a^2c}\end{aligned}$$

Mathematica [A] time = 1.23, size = 0, normalized size = 0.00

$$\int \frac{x^2 \sqrt{\tan^{-1}(ax)}}{c+a^2cx^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
[Out] Integrate[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.60, size = 0, normalized size = 0.00

$$\int \frac{x^2 \sqrt{\arctan(ax)}}{a^2 c\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2\, \sqrt{\mathrm{atan}(a\, x)}}{c\, a^2\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2 \sqrt{\mathrm{atan}(ax)}}{a^2 x^2 + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(1/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**2*sqrt(atan(a*x))/(a**2*x**2 + 1), x)/c
```

3.701 $\int \frac{x\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx$

Optimal. Leaf size=41

$$\frac{2x\tan^{-1}(ax)^{3/2}}{3ac}-\frac{2\text{Int}\left(\tan^{-1}(ax)^{3/2},x\right)}{3ac}$$

```
[Out] 2/3*x*arctan(a*x)^(3/2)/a/c-2/3*Unintegrable(arctan(a*x)^(3/2),x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
```

```
[Out] (2*x*ArcTan[a*x]^(3/2))/(3*a*c) - (2*Defer[Int][ArcTan[a*x]^(3/2), x])/(3*a
*c)
```

Rubi steps

$$\int \frac{x\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx=\frac{2x\tan^{-1}(ax)^{3/2}}{3ac}-\frac{2\int \tan^{-1}(ax)^{3/2}\,dx}{3ac}$$

Mathematica [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\arctan\left(a x\right)}}{a^{2} c\,x^{2}+c}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{c\,a^2\,x^2+c} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{2} x^{2} + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(1/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x*sqrt(atan(a*x))/(a**2*x**2 + 1), x)/c
```

3.702 $\int \frac{\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx$

Optimal. Leaf size=18

$$\frac{2\tan^{-1}(ax)^{3/2}}{3ac}$$

```
[Out] 2/3*arctan(a*x)^(3/2)/a/c
```

Rubi [A] time = 0.02, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4884}

$$\frac{2\tan^{-1}(ax)^{3/2}}{3ac}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2),x]
```

```
[Out] (2*ArcTan[a*x]^(3/2))/(3*a*c)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx = \frac{2\tan^{-1}(ax)^{3/2}}{3ac}$$

Mathematica [A] time = 0.00, size = 18, normalized size = 1.00

$$\frac{2\tan^{-1}(ax)^{3/2}}{3ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2),x]
```

```
[Out] (2*ArcTan[a*x]^(3/2))/(3*a*c)
```

fricas [A] time = 0.40, size = 14, normalized size = 0.78

$$\frac{2\,\arctan\left(ax\right)^{\frac{3}{2}}}{3\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] 2/3*arctan(a*x)^(3/2)/(a*c)
```

giac [A] time = 0.12, size = 14, normalized size = 0.78

$$\frac{2\,\arctan\left(ax\right)^{\frac{3}{2}}}{3\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] 2/3*arctan(a*x)^(3/2)/(a*c)
```

maple [A] time = 0.17, size = 15, normalized size = 0.83

$$\frac{2\arctan(ax)^{\frac{3}{2}}}{3ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c),x)
```

```
[Out] 2/3*arctan(a*x)^(3/2)/a/c
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 0.38, size = 14, normalized size = 0.78

$$\frac{2\operatorname{atan}(a\,x)^{3/2}}{3\,a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(c + a^2*c*x^2),x)
```

```
[Out] (2*atan(a*x)^(3/2))/(3*a*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}(ax)}}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**2*x**2 + 1), x)/c
```

3.703 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x(c+a^2cx^2)}\,dx$

Optimal. Leaf size=49

$$\frac{i\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x(ax+i)},x\right)}{c}-\frac{2i\tan^{-1}(ax)^{3/2}}{3c}$$

```
[Out] -2/3*I*arctan(a*x)^(3/2)/c+I*Unintegrable(arctan(a*x)^(1/2)/x/(I+a*x),x)/c
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)),x]
```

```
[Out] (((-2*I)/3)*ArcTan[a*x]^(3/2))/c + (I*Defer[Int][Sqrt[ArcTan[a*x]]/(x*(I + a*x)), x])/c
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)}\,dx=-\frac{2i\tan^{-1}(ax)^{3/2}}{3c}+\frac{i\int \frac{\sqrt{\tan^{-1}(ax)}}{x(i+ax)}\,dx}{c}$$

Mathematica [A] time = 0.63, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.60, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan \left(a x\right)}}{x \left(a^{2} c \,x^{2}+c \right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{2} x^{3} + x}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x/(a**2*c*x**2+c),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**2*x**3 + x), x)/c
```

3.704 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2(c+a^2cx^2)}\,dx$

Optimal. Leaf size=36

$$\frac{\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x^2},x\right)}{c}-\frac{2a\tan^{-1}(ax)^{3/2}}{3c}$$

```
[Out] -2/3*a*arctan(a*x)^(3/2)/c+Unintegrable(arctan(a*x)^(1/2)/x^2,x)/c
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x^2*(c + a^2*c*x^2)),x]
[Out] (-2*a*ArcTan[a*x]^(3/2))/(3*c) + Defer[Int][Sqrt[ArcTan[a*x]]/x^2, x]/c
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx\right)+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2}\,dx}{c}\\ &= -\frac{2a\tan^{-1}(ax)^{3/2}}{3c}+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2}\,dx}{c}\end{aligned}$$

Mathematica [A] time = 1.60, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x^2*(c + a^2*c*x^2)),x]
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x^2*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.27, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan (ax)}}{x^2 \left(a^2 c\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x^2\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{2} x^{4} + x^{2}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**2*x**4 + x**2), x)/c
```

3.705 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3(c+a^2cx^2)}\,dx$

Optimal. Leaf size=74

$$-\frac{ia^2\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x(ax+i)},x\right)}{c}+\frac{\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x^3},x\right)}{c}+\frac{2ia^2\tan^{-1}(ax)^{3/2}}{3c}$$

```
[Out] 2/3*I*a^2*arctan(a*x)^(3/2)/c+Unintegrable(arctan(a*x)^(1/2)/x^3,x)/c-I*a^2
*Unintegrable(arctan(a*x)^(1/2)/x/(I+a*x),x)/c
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] (((2*I)/3)*a^2*ArcTan[a*x]^(3/2))/c + Defer[Int][Sqrt[ArcTan[a*x]]/x^3, x]/
c - (I*a^2*Defer[Int][Sqrt[ArcTan[a*x]]/(x*(I + a*x)), x])/c
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3}\,dx}{c}\\ &= \frac{2ia^2\tan^{-1}(ax)^{3/2}}{3c}+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3}\,dx}{c}-\frac{\left(ia^2\right)\int \frac{\sqrt{\tan^{-1}(ax)}}{x(i+ax)}\,dx}{c}\end{aligned}$$

Mathematica [A] time = 2.31, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x^3*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 5.98, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan\left(ax\right)}}{x^{3}\left(a^{2}c\,x^{2}+c\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c),x)
[Out] int(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x^3\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x^3*(c + a^2*c*x^2)),x)
[Out] int(atan(a*x)^(1/2)/(x^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{a^{2}x^{5}+x^{3}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x**3/(a**2*c*x**2+c),x)
[Out] Integral(sqrt(atan(a*x))/(a**2*x**5 + x**3), x)/c
```

3.706 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4(c+a^2cx^2)}\,dx$

Optimal. Leaf size=61

$$-\frac{a^2\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x^2},x\right)}{c}+\frac{\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x^4},x\right)}{c}+\frac{2a^3\tan^{-1}(ax)^{3/2}}{3c}$$

```
[Out] 2/3*a^3*arctan(a*x)^(3/2)/c+Unintegrable(arctan(a*x)^(1/2)/x^4,x)/c-a^2*Uni
ntegrable(arctan(a*x)^(1/2)/x^2,x)/c
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] (2*a^3*ArcTan[a*x]^(3/2))/(3*c) + Defer[Int][Sqrt[ArcTan[a*x]]/x^4, x]/c -
(a^2*Defer[Int][Sqrt[ArcTan[a*x]]/x^2, x])/c
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4}\,dx}{c}\\
&= a^4\int \frac{\sqrt{\tan^{-1}(ax)}}{c+a^2cx^2}\,dx+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4}\,dx}{c}-\frac{a^2\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2}\,dx}{c}\\
&= \frac{2a^3\tan^{-1}(ax)^{3/2}}{3c}+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4}\,dx}{c}-\frac{a^2\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2}\,dx}{c}
\end{aligned}$$

Mathematica [A] time = 6.51, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x^4*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A]   time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A]   time = 3.79, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{x^4\left(a^2c\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x^4\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x^4*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x^4*(c + a^2*c*x^2)), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{a^{2}x^{6}+x^{4}}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x**4/(a**2*c*x**2+c),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**2*x**6 + x**4), x)/c
```

3.707 $\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^2},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]
[Out] Defer[Int][(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2, x]
```

Rubi steps

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2} \, dx = \int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2} \, dx$$

Mathematica [A] time = 1.76, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]
[Out] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \sqrt{\arctan(ax)}}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
[Out] integral(x^m*sqrt(arctan(a*x))/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 3.03, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{\arctan \left(a x\right)}}{\left(a^{2} c \,x^{2}+c\right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m} \sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{4} x^{4} + 2 a^{2} x^{2} + 1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(1/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**m*sqrt(atan(a*x))/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.708 $\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^2},x\right)$$

[Out] Unintegrable(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]

[Out] Defer[Int][(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2, x]

Rubi steps

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx=\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$$

Mathematica [A] time = 3.91, size = 0, normalized size = 0.00

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]

[Out] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2, x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 2.36, size = 0, normalized size = 0.00

$$\int \frac{x^3 \sqrt{\arctan(ax)}}{\left(a^2 c\, x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^3 \sqrt{\mathrm{atan}(a\, x)}}{\left(c\, a^2\, x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \sqrt{\mathrm{atan}(ax)}}{a^4 x^4 + 2a^2 x^2 + 1}\, dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(1/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**3*sqrt(atan(a*x))/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.709 $\int \frac{x^2 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2} \, dx$

Optimal. Leaf size=80

$$\frac{\sqrt{\pi} S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^3c^2}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}-\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(a^2x^2+1\right)}$$

```
[Out] 1/3*arctan(a*x)^(3/2)/a^3/c^2+1/8*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi
^(1/2)/a^3/c^2-1/2*x*arctan(a*x)^(1/2)/a^2/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.15, antiderivative size = 80, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4936, 4970, 4406, 12, 3305, 3351}

$$\frac{\sqrt{\pi} S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^3c^2}-\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]
```

```
[Out] -(x*Sqrt[ArcTan[a*x]])/(2*a^2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^(3/2)/(3*a^3
*c^2) + (Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(8*a^3*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx &= -\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}+\frac{\int \frac{x}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{4a}\\
&= -\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}+\frac{\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^3c^2}\\
&= -\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}+\frac{\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^3c^2}\\
&= -\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}+\frac{\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8a^3c^2}\\
&= -\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}+\frac{\text{Subst}\left(\int \sin\left(2x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{4a^3c^2}\\
&= -\frac{x\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3a^3c^2}+\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^3c^2}
\end{aligned}$$

Mathematica [A] time = 0.21, size = 66, normalized size = 0.82

$$\frac{4\sqrt{\tan^{-1}(ax)}\left(2\tan^{-1}(ax)-\frac{3ax}{a^2x^2+1}\right)+3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{24a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]
```

```
[Out] (4*Sqrt[ArcTan[a*x]]*((-3*a*x)/(1 + a^2*x^2) + 2*ArcTan[a*x]) + 3*Sqrt[Pi]*
FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(24*a^3*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.51, size = 60, normalized size = 0.75

$$\frac{3\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+8\arctan(ax)^2-6\sin(2\arctan(ax))\arctan(ax)}{24a^3c^2\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/24/a^3/c^2*(3*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^
(1/2))+8*arctan(a*x)^2-6*sin(2*arctan(a*x))*arctan(a*x))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\sqrt{\mathrm{atan}(a\,x)}}{\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2\sqrt{\mathrm{atan}(ax)}}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(1/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**2*sqrt(atan(a*x))/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.710 $\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=79

$$\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^2c^2}-\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^2}$$

```
[Out] 1/8*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^2+1/4*arctan(a*x)
^(1/2)/a^2/c^2-1/2*arctan(a*x)^(1/2)/a^2/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.12, antiderivative size = 79, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4930, 4904, 3312, 3304, 3352}

$$\frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^2c^2}-\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]
```

```
[Out] Sqrt[ArcTan[a*x]]/(4*a^2*c^2) - Sqrt[ArcTan[a*x]]/(2*a^2*c^2*(1 + a^2*x^2))
 + (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(8*a^2*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx &= -\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{4a}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^2c^2}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{4a^2c^2}\\
&= \frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^2}-\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8a^2c^2}\\
&= \frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^2}-\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\text{Subst}\left(\int \cos\left(2x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{4a^2c^2}\\
&= \frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^2}-\frac{\sqrt{\tan^{-1}(ax)}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^2c^2}
\end{aligned}$$

Mathematica [C] time = 0.28, size = 136, normalized size = 1.72

$$\frac{4\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+\frac{\frac{16\left(a^2x^2-1\right)\tan^{-1}(ax)}{a^2x^2+1}-i\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)+i\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)}{\sqrt{\tan^{-1}(ax)}}}{64a^2c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^2,x]
```

```
[Out] (4*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + ((16*(-1 + a^2*x^2)*
ArcTan[a*x])/(1 + a^2*x^2) - I*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-
2*I)*ArcTan[a*x]] + I*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a
*x]])/Sqrt[ArcTan[a*x]])/(64*a^2*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.39, size = 46, normalized size = 0.58

$$-\frac{\sqrt{\arctan(ax)}\ \cos(2\arctan(ax))}{4a^2c^2}+\frac{\mathrm{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{8a^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/4/a^2/c^2*arctan(a*x)^(1/2)*cos(2*arctan(a*x))+1/8*FresnelC(2*arctan(a*x
)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x\sqrt{\operatorname{atan}(ax)}}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(1/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x*sqrt(atan(a*x))/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.711 $\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=77

$$\frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(a^2x^2+1\right)}-\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8ac^2}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}$$

```
[Out] 1/3*arctan(a*x)^(3/2)/a/c^2-1/8*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(
1/2)/a/c^2+1/2*x*arctan(a*x)^(1/2)/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.10, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4892, 4970, 4406, 12, 3305, 3351}

$$\frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(a^2x^2+1\right)}-\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8ac^2}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^2,x]
```

```
[Out] (x*Sqrt[ArcTan[a*x]])/(2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^(3/2)/(3*a*c^2) -
 (Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(8*a*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx = \frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}-\frac{1}{4}a\int \frac{x}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}-\frac{\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4ac^2}$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}-\frac{\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4ac^2}$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}-\frac{\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8ac^2}$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}-\frac{\text{Subst}\left(\int \sin\left(2x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{4ac^2}$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{3/2}}{3ac^2}-\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8ac^2}$$

Mathematica [C] time = 0.17, size = 89, normalized size = 1.16

$$\frac{16\tan^{-1}(ax)^2+3\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{3}{2},-2i\tan^{-1}(ax)\right)+3\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{3}{2},2i\tan^{-1}(ax)\right)}{48ac^2\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^2,x]
```

```
[Out] (16*ArcTan[a*x]^2 + 3*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[3/2, (-2*I)*ArcT
an[a*x]] + 3*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[3/2, (2*I)*ArcTan[a*x]])/(48
*a*c^2*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.57, size = 60, normalized size = 0.78

$$\frac{8 \arctan \left(a x\right)^{2}+6 \sin \left(2 \arctan \left(a x\right)\right) \arctan \left(a x\right)-3 \sqrt{\arctan \left(a x\right)}\, \sqrt{\pi}\, \mathrm{S}\left(\frac{2 \sqrt{\arctan \left(a x\right)}}{\sqrt{\pi}}\right)}{24 a \,c^{2} \sqrt{\arctan \left(a x\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/24/a/c^2/arctan(a*x)^(1/2)*(8*arctan(a*x)^2+6*sin(2*arctan(a*x))*arctan(a
*x)-3*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2)))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^2,x)
```

```
[Out] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{4} x^{4} + 2 a^{2} x^{2} + 1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.712 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\left(a^2cx^2+c\right)^2},x\right)$$

[Out] Unintegrable(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^2),x]

[Out] Defer[Int][Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^2), x]

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^2}\,dx=\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^2}\,dx$$

Mathematica [A] time = 1.84, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^2),x]

[Out] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^2), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^2,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ rate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^2,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 3.16, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{x\left(a^2 c\, x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{\mathrm{atan}(a\, x)}}{x\left(c\, a^2\, x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}(ax)}}{a^4x^5+2a^2x^3+x}\, dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**4*x**5 + 2*a**2*x**3 + x), x)/c**2
```

3.713 $\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^3}, x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
[Out] Defer[Int][(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3, x]
```

Rubi steps

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3} dx = \int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3} dx$$

Mathematica [A] time = 2.19, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
[Out] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3, x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \sqrt{\arctan(ax)}}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
[Out] integral(x^m*sqrt(arctan(a*x))/(a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2
 + c^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.29, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{\arctan(ax)}}{(a^2 c\, x^2 + c)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\, \sqrt{\mathrm{atan}\left(a\, x\right)}}{{\left(c\, a^2\, x^2 + c\right)}^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(1/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Timed out
```

3.714 $\int \frac{x^5\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^5\sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(x^5*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^5*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] Defer[Int][(x^5*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3, x]
```

Rubi steps

$$\int \frac{x^5\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx=\int \frac{x^5\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx$$

Mathematica [A] time = 5.45, size = 0, normalized size = 0.00

$$\int \frac{x^5\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^5*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] Integrate[(x^5*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 4.19, size = 0, normalized size = 0.00

$$\int \frac{x^{5} \sqrt{\arctan \left(a x\right)}}{\left(a^{2} c \,x^{2}+c \right)^{3}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^5*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)

[Out] int(x^5*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^5*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima: expt: undefined: 0 to a negative exponent.

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^5\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^5*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3,x)

[Out] int((x^5*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3, x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{5} \sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**5*atan(a*x)**(1/2)/(a**2*c*x**2+c)**3,x)

[Out] Integral(x**5*sqrt(atan(a*x))/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c**3

3.715 $\int \frac{x^4 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=139

$$-\frac{\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^5c^3}+\frac{\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^5c^3}+\frac{\tan^{-1}(ax)^{3/2}}{4a^5c^3}-\frac{\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}(ax)\right)}{4a^5c^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin(}{32a^5c}$$

```
[Out] 1/4*arctan(a*x)^(3/2)/a^5/c^3-1/128*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)
^(1/2))*2^(1/2)*Pi^(1/2)/a^5/c^3+1/8*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))
*Pi^(1/2)/a^5/c^3-1/4*sin(2*arctan(a*x))*arctan(a*x)^(1/2)/a^5/c^3+1/32*sin
(4*arctan(a*x))*arctan(a*x)^(1/2)/a^5/c^3
```

Rubi [A] time = 0.18, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.208$, Rules used = {4970, 3312, 3296, 3305, 3351}

$$-\frac{\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^5c^3}+\frac{\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^5c^3}+\frac{\tan^{-1}(ax)^{3/2}}{4a^5c^3}-\frac{\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}(ax)\right)}{4a^5c^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin(}{32a^5c}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] ArcTan[a*x]^(3/2)/(4*a^5*c^3) - (Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcT
an[a*x]]])/(64*a^5*c^3) + (Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]
])/(8*a^5*c^3) - (Sqrt[ArcTan[a*x]]*Sin[2*ArcTan[a*x]])/(4*a^5*c^3) + (Sqrt
[ArcTan[a*x]]*Sin[4*ArcTan[a*x]])/(32*a^5*c^3)
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
```

```
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{\text{Subst}\left(\int \sqrt{x}\,\sin^4(x)\,dx, x, \tan^{-1}(ax)\right)}{a^5c^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{3\sqrt{x}}{8}-\frac{1}{2}\sqrt{x}\,\cos(2x)+\frac{1}{8}\sqrt{x}\,\cos(4x)\right)dx, x, \tan^{-1}(ax)\right)}{a^5c^3}$$

$$= \frac{\tan^{-1}(ax)^{3/2}}{4a^5c^3}+\frac{\text{Subst}\left(\int \sqrt{x}\,\cos(4x)\,dx, x, \tan^{-1}(ax)\right)}{8a^5c^3}-\frac{\text{Subst}\left(\int \sqrt{x}\,\cos(2x)\,dx, x, \text{ta}\right.}{2a^5c^3}$$

$$= \frac{\tan^{-1}(ax)^{3/2}}{4a^5c^3}-\frac{\sqrt{\tan^{-1}(ax)}\,\sin\left(2\tan^{-1}(ax)\right)}{4a^5c^3}+\frac{\sqrt{\tan^{-1}(ax)}\,\sin\left(4\tan^{-1}(ax)\right)}{32a^5c^3}-\frac{\text{Subs}}{}$$

$$= \frac{\tan^{-1}(ax)^{3/2}}{4a^5c^3}-\frac{\sqrt{\tan^{-1}(ax)}\,\sin\left(2\tan^{-1}(ax)\right)}{4a^5c^3}+\frac{\sqrt{\tan^{-1}(ax)}\,\sin\left(4\tan^{-1}(ax)\right)}{32a^5c^3}-\frac{\text{Subs}}{}$$

$$= \frac{\tan^{-1}(ax)^{3/2}}{4a^5c^3}-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^5c^3}+\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8a^5c^3}-\frac{\sqrt{\tan^{-1}(ax)}\,\sin\left(2\,\text{t}\right.}{4a^5c^3}$$

Mathematica [C] time = 0.53, size = 181, normalized size = 1.30

$$\frac{-\frac{96ax\tan^{-1}(ax)}{\left(a^2x^2+1\right)^2}-\frac{160a^3x^3\tan^{-1}(ax)}{\left(a^2x^2+1\right)^2}+64\tan^{-1}(ax)^2-8\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)-8\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma}{256a^5c^3\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] ((-96*a*x*ArcTan[a*x])/(1 + a^2*x^2)^2 - (160*a^3*x^3*ArcTan[a*x])/(1 + a^2
*x^2)^2 + 64*ArcTan[a*x]^2 - 8*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-
2*I)*ArcTan[a*x]] - 8*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a
*x]] + Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + Sqrt[I*ArcTa
n[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/(256*a^5*c^3*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.70, size = 102, normalized size = 0.73

$$\frac{-\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan(ax)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+16\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+32\arctan(ax)^{2}+4\sin(4\arctan}{128a^{5}c^{3}\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/128/a^5/c^3/arctan(a*x)^(1/2)*(-2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*Fresne
lS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))+16*arctan(a*x)^(1/2)*Pi^(1/2)*Fres
nelS(2*arctan(a*x)^(1/2)/Pi^(1/2))+32*arctan(a*x)^2+4*sin(4*arctan(a*x))*ar
ctan(a*x)-32*sin(2*arctan(a*x))*arctan(a*x))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^4*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{4} \sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**(1/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**4*sqrt(atan(a*x))/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
x)/c**3
```

3.716 $\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=118

$$-\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^4c^3}+\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{16a^4c^3}-\frac{3\sqrt{\tan^{-1}(ax)}}{32a^4c^3}+\frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(a^2x^2+1\right)^2}$$

```
[Out] -1/128*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^4/
c^3+1/16*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^3-3/32*arcta
n(a*x)^(1/2)/a^4/c^3+1/4*x^4*arctan(a*x)^(1/2)/c^3/(a^2*x^2+1)^2
```

Rubi [A] time = 0.21, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4944, 4970, 3312, 3304, 3352}

$$-\frac{\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^4c^3}+\frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{16a^4c^3}+\frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(a^2x^2+1\right)^2}-\frac{3\sqrt{\tan^{-1}(ax)}}{32a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-3*Sqrt[ArcTan[a*x]])/(32*a^4*c^3) + (x^4*Sqrt[ArcTan[a*x]])/(4*c^3*(1 + a
^2*x^2)^2) - (Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(64*a^4*
c^3) + (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(16*a^4*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx &= \frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(1+a^2x^2\right)^2}-\frac{1}{8}a\int \frac{x^4}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx\\
&= \frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(1+a^2x^2\right)^2}-\frac{\text{Subst}\left(\int \frac{\sin^4(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8a^4c^3}\\
&= \frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(1+a^2x^2\right)^2}-\frac{\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}-\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{8a^4c^3}\\
&= -\frac{3\sqrt{\tan^{-1}(ax)}}{32a^4c^3}+\frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(1+a^2x^2\right)^2}-\frac{\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{64a^4c^3}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\right.}{16a}\\
&= -\frac{3\sqrt{\tan^{-1}(ax)}}{32a^4c^3}+\frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(1+a^2x^2\right)^2}-\frac{\text{Subst}\left(\int \cos\left(4x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{32a^4c^3}+\frac{\text{Subst}\left(\int c\right.}{}\\
&= -\frac{3\sqrt{\tan^{-1}(ax)}}{32a^4c^3}+\frac{x^4\sqrt{\tan^{-1}(ax)}}{4c^3\left(1+a^2x^2\right)^2}-\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^4c^3}+\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{16a^4c^3}\end{aligned}$$

Mathematica [C] time = 0.71, size = 230, normalized size = 1.95

$$\frac{\frac{\frac{64\left(5a^4x^4-6a^2x^2-3\right)\tan^{-1}(ax)}{\left(a^2x^2+1\right)^2}-12i\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)+12i\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)+3i\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}(ax)\right)-3i}{\sqrt{\tan^{-1}(ax)}}}{2048a^4c^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-10*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + 80*Sqrt[Pi]*Fres
nelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + ((64*(-3 - 6*a^2*x^2 + 5*a^4*x^4)*Ar
cTan[a*x])/(1 + a^2*x^2)^2 - (12*I)*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/
2, (-2*I)*ArcTan[a*x]] + (12*I)*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I
)*ArcTan[a*x]] + (3*I)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]
] - (3*I)*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/Sqrt[ArcTan[a*
x]])/(2048*a^4*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.49, size = 94, normalized size = 0.80

$$\frac{-\sqrt{2}\,\sqrt{\arctan\left(ax\right)}\,\sqrt{\pi}\,\,\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+4\cos\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)-16\cos\left(2\arctan\left(ax\right)\right)}{128a^4c^3\sqrt{\arctan\left(ax\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/128/a^4/c^3/arctan(a*x)^(1/2)*(-2^(1/2)*arctan(a*x)^(1/2)*Pi^(1/2)*Fresne
lC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))+4*cos(4*arctan(a*x))*arctan(a*x)-1
6*cos(2*arctan(a*x))*arctan(a*x)+8*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelC(2*ar
ctan(a*x)^(1/2)/Pi^(1/2)))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(1/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**3*sqrt(atan(a*x))/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
x)/c**3
```

3.717 $\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=83

$$\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^3c^3}+\frac{\tan^{-1}(ax)^{3/2}}{12a^3c^3}-\frac{\sqrt{\tan^{-1}(ax)}\,\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3}$$

```
[Out] 1/12*arctan(a*x)^(3/2)/a^3/c^3+1/128*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x
)^(1/2))*2^(1/2)*Pi^(1/2)/a^3/c^3-1/32*sin(4*arctan(a*x))*arctan(a*x)^(1/2)
/a^3/c^3
```

Rubi [A] time = 0.14, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4970, 4406, 3296, 3305, 3351}

$$\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^3c^3}+\frac{\tan^{-1}(ax)^{3/2}}{12a^3c^3}-\frac{\sqrt{\tan^{-1}(ax)}\,\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] ArcTan[a*x]^(3/2)/(12*a^3*c^3) + (Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[Arc
Tan[a*x]]])/(64*a^3*c^3) - (Sqrt[ArcTan[a*x]]*Sin[4*ArcTan[a*x]])/(32*a^3*c
^3)
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
```

```
|| GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{\text{Subst}\left(\int \sqrt{x}\cos^2(x)\sin^2(x)\,dx, x, \tan^{-1}(ax)\right)}{a^3c^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{\sqrt{x}}{8}-\frac{1}{8}\sqrt{x}\cos(4x)\right)dx, x, \tan^{-1}(ax)\right)}{a^3c^3}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{12a^3c^3} - \frac{\text{Subst}\left(\int \sqrt{x}\cos(4x)\,dx, x, \tan^{-1}(ax)\right)}{8a^3c^3}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{12a^3c^3} - \frac{\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3} + \frac{\text{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{64a^3c^3}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{12a^3c^3} - \frac{\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3} + \frac{\text{Subst}\left(\int \sin\left(4x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{32a^3c^3}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{12a^3c^3} + \frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^3c^3} - \frac{\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3}$$

Mathematica [C] time = 0.42, size = 141, normalized size = 1.70

$$\frac{32\tan^{-1}(ax)\left(3ax\left(a^2x^2-1\right)+2\left(a^2x^2+1\right)^2\tan^{-1}(ax)\right)-3\left(a^2x^2+1\right)^2\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}(ax)\right)-3}{768a^3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (32*ArcTan[a*x]*(3*a*x*(-1 + a^2*x^2) + 2*(1 + a^2*x^2)^2*ArcTan[a*x]) - 3*
(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] - 3*(
1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/(768*a^3*
c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.63, size = 66, normalized size = 0.80

$$\frac{3\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan\left(ax\right)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+32\arctan\left(ax\right)^{2}-12\sin\left(4\arctan\left(ax\right)\right)\arctan\left(ax\right)}{384a^{3}c^{3}\sqrt{\arctan\left(ax\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/384/a^3/c^3*(3*2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*FresnelS(2*2^(1/2)/Pi^(
1/2)*arctan(a*x)^(1/2))+32*arctan(a*x)^2-12*sin(4*arctan(a*x))*arctan(a*x))
/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2}\sqrt{\operatorname{atan}{\left(ax \right)}}}{a^{6}x^{6}+3a^{4}x^{4}+3a^{2}x^{2}+1}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(1/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**2*sqrt(atan(a*x))/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
x)/c**3
```

3.718 $\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=118

$$\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^2c^3}+\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{16a^2c^3}-\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3\sqrt{\tan^{-1}(ax)}}{32a^2c^3}$$

```
[Out] 1/128*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^2/c
^3+1/16*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^3+3/32*arctan
(a*x)^(1/2)/a^2/c^3-1/4*arctan(a*x)^(1/2)/a^2/c^3/(a^2*x^2+1)^2
```

Rubi [A] time = 0.15, antiderivative size = 118, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4930, 4904, 3312, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^2c^3}+\frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{16a^2c^3}-\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3\sqrt{\tan^{-1}(ax)}}{32a^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (3*Sqrt[ArcTan[a*x]])/(32*a^2*c^3) - Sqrt[ArcTan[a*x]]/(4*a^2*c^3*(1 + a^2*
x^2)^2) + (Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(64*a^2*c^3
) + (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(16*a^2*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
```

```
1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{8a}$$

$$= -\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8a^2c^3}$$

$$= -\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{8a^2c^3}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{32a^2c^3}-\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{64a^2c^3}+\frac{\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,d\right.}{16a}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{32a^2c^3}-\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{\text{Subst}\left(\int \cos\left(4x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{32a^2c^3}+\frac{\text{Subst}\left(\int \text{c}\right.}{}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{32a^2c^3}-\frac{\sqrt{\tan^{-1}(ax)}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64a^2c^3}+\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{16a^2c^3}$$

Mathematica [C] time = 0.69, size = 230, normalized size = 1.95

$$\frac{\frac{\frac{64\left(3a^4x^4+6a^2x^2-5\right)\tan^{-1}(ax)}{\left(a^2x^2+1\right)^2}-20i\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)+20i\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)-11i\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}(ax)\right)+1}{\sqrt{\tan^{-1}(ax)}}}{2048a^2c^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-6*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + 48*Sqrt[Pi]*Fresn
elC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + ((64*(-5 + 6*a^2*x^2 + 3*a^4*x^4)*Arc
Tan[a*x])/(1 + a^2*x^2)^2 - (20*I)*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2
, (-2*I)*ArcTan[a*x]] + (20*I)*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)
*ArcTan[a*x]] - (11*I)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]
] + (11*I)*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/Sqrt[ArcTan[a
*x]])/(2048*a^2*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.52, size = 94, normalized size = 0.80

$$-\frac{-\sqrt{2}\,\sqrt{\arctan(ax)}\,\sqrt{\pi}\ \mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-8\sqrt{\arctan(ax)}\,\sqrt{\pi}\ \mathrm{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+16\cos(2}{128a^2c^3\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
[Out] -1/128/a^2/c^3/arctan(a*x)^(1/2)*(-2^(1/2)*arctan(a*x)^(1/2)*Pi^(1/2)*Fresn
elC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))-8*arctan(a*x)^(1/2)*Pi^(1/2)*Fres
nelC(2*arctan(a*x)^(1/2)/Pi^(1/2))+16*cos(2*arctan(a*x))*arctan(a*x)+4*cos(
4*arctan(a*x))*arctan(a*x))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3,x)
[Out] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x\sqrt{\operatorname{atan}{\left(ax \right)}}}{a^{6}x^{6}+3a^{4}x^{4}+3a^{2}x^{2}+1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(1/2)/(a**2*c*x**2+c)**3,x)
[Out] Integral(x*sqrt(atan(a*x))/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/
c**3
```

3.719 $\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=139

$$-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64ac^3}-\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8ac^3}+\frac{\tan^{-1}(ax)^{3/2}}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}(ax)\right)}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(\right.}{32ac}$$

```
[Out] 1/4*arctan(a*x)^(3/2)/a/c^3-1/128*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(
1/2))*2^(1/2)*Pi^(1/2)/a/c^3-1/8*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^
(1/2)/a/c^3+1/4*sin(2*arctan(a*x))*arctan(a*x)^(1/2)/a/c^3+1/32*sin(4*arcta
n(a*x))*arctan(a*x)^(1/2)/a/c^3
```

Rubi [A] time = 0.14, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4904, 3312, 3296, 3305, 3351}

$$-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64ac^3}-\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8ac^3}+\frac{\tan^{-1}(ax)^{3/2}}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}(ax)\right)}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(\right.}{32ac}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^3,x]
```

```
[Out] ArcTan[a*x]^(3/2)/(4*a*c^3) - (Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan
[a*x]]])/(64*a*c^3) - (Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(
8*a*c^3) + (Sqrt[ArcTan[a*x]]*Sin[2*ArcTan[a*x]])/(4*a*c^3) + (Sqrt[ArcTan[
a*x]]*Sin[4*ArcTan[a*x]])/(32*a*c^3)
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
```

```
+ 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{\text{Subst}\left(\int \sqrt{x}\cos^4(x)\,dx, x, \tan^{-1}(ax)\right)}{ac^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{3\sqrt{x}}{8}+\frac{1}{2}\sqrt{x}\cos(2x)+\frac{1}{8}\sqrt{x}\cos(4x)\right)dx, x, \tan^{-1}(ax)\right)}{ac^3}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{4ac^3}+\frac{\text{Subst}\left(\int \sqrt{x}\cos(4x)\,dx, x, \tan^{-1}(ax)\right)}{8ac^3}+\frac{\text{Subst}\left(\int \sqrt{x}\cos(2x)\,dx, x, \tan\right.}{2ac^3}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}(ax)\right)}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{32ac^3}-\frac{\text{Subst}\left(\right.}{}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}(ax)\right)}{4ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{32ac^3}-\frac{\text{Subst}\left(\right.}{}$$
$$= \frac{\tan^{-1}(ax)^{3/2}}{4ac^3}-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{64ac^3}-\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{8ac^3}+\frac{\sqrt{\tan^{-1}(ax)}\sin\left(2\tan\right.}{4ac^3}$$

Mathematica [A] time = 0.46, size = 103, normalized size = 0.74

$$-\frac{-16\sqrt{\tan^{-1}(ax)}\left(\frac{ax\left(3a^2x^2+5\right)}{\left(a^2x^2+1\right)^2}+2\tan^{-1}(ax)\right)+\sqrt{2\pi}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+16\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128ac^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^3,x]
```

```
[Out] -1/128*(-16*Sqrt[ArcTan[a*x]]*((a*x*(5 + 3*a^2*x^2))/(1 + a^2*x^2)^2 + 2*Ar
cTan[a*x]) + Sqrt[2*Pi]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + 16*Sqrt[
Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(a*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.66, size = 102, normalized size = 0.73

$$\frac{-\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan(ax)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-16\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+32\arctan(ax)^{2}+32\sin(2\,\mathrm{ar}}{128a\,c^{3}\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/128/a/c^3/arctan(a*x)^(1/2)*(-2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*FresnelS
(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))-16*arctan(a*x)^(1/2)*Pi^(1/2)*Fresne
lS(2*arctan(a*x)^(1/2)/Pi^(1/2))+32*arctan(a*x)^2+32*sin(2*arctan(a*x))*arc
tan(a*x)+4*sin(4*arctan(a*x))*arctan(a*x))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{a^{6}x^{6}+3a^{4}x^{4}+3a^{2}x^{2}+1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c*
*3
```

3.720 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] Defer[Int][Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^3), x]
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^3}\,dx=\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Mathematica [A] time = 2.46, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^3), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 5.49, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{x\left(a^2 c x^2 + c\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^3,x)
```

```
[Out] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{\mathrm{atan}(a\,x)}}{x\left(c\,a^2\,x^2 + c\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\sqrt{\mathrm{atan}(ax)}}{a^6x^7+3a^4x^5+3a^2x^3+x}\, dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(sqrt(atan(a*x))/(a**6*x**7 + 3*a**4*x**5 + 3*a**2*x**3 + x), x)/c*
*3
```

3.721 $\int x^m \sqrt{c+a^2 c x^2} \sqrt{\tan^{-1}(ax)} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \sqrt{a^2 c x^2+c} \sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \sqrt{c+a^2 c x^2} \sqrt{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][x^m*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^m \sqrt{c+a^2 c x^2} \sqrt{\tan^{-1}(ax)} \, dx = \int x^m \sqrt{c+a^2 c x^2} \sqrt{\tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 1.04, size = 0, normalized size = 0.00

$$\int x^m \sqrt{c+a^2 c x^2} \sqrt{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[x^m*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2 c x^2+c}\, x^m \sqrt{\arctan(ax)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*sqrt(arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.65, size = 0, normalized size = 0.00

$$\int x^m \sqrt{a^2 c\, x^2+c}\, \sqrt{\arctan(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m \sqrt{\operatorname{atan}(a\,x)}\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m \sqrt{c\left(a^2x^2+1\right)}\,\sqrt{\operatorname{atan}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)*atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x)), x)
```

3.722 $\int x^2\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(x^2\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^2\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx=\int x^2\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 3.77, size = 0, normalized size = 0.00

$$\int x^2\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.55, size = 0, normalized size = 0.00

$$\int x^2\sqrt{a^2c\,x^2+c}\,\sqrt{\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\sqrt{c\,a^2\,x^2+c}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^2*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}\sqrt{c\left(a^{2}x^{2}+1\right)}\sqrt{\operatorname{atan}{\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(1/2)*atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x)), x)
```

3.723 $\int x\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=66

$$\frac{(a^2cx^2+c)^{3/2}\sqrt{\tan^{-1}(ax)}}{3a^2c}-\frac{\operatorname{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{\tan^{-1}(ax)}},x\right)}{6a}$$

[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2)/a^2/c-1/6*Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Int[x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]

[Out] ((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]])/(3*a^2*c) - Defer[Int][Sqrt[c + a^2*c*x^2]/Sqrt[ArcTan[a*x]], x]/(6*a)

Rubi steps

$$\int x\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx=\frac{(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}}{3a^2c}-\frac{\int\frac{\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx}{6a}$$

Mathematica [A] time = 7.38, size = 0, normalized size = 0.00

$$\int x\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]

[Out] Integrate[x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="giac")

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.38, size = 0, normalized size = 0.00

$$\int x\sqrt{a^2c\,x^2+c}\,\sqrt{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x\sqrt{c\left(a^2x^2+1\right)}\,\sqrt{\mathrm{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(1/2)*atan(a*x)**(1/2),x)
```

```
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x)), x)
```

3.724 $\int \sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=26

$$\mathrm{Int}\left(\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx=\int \sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 0.73, size = 0, normalized size = 0.00

$$\int \sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.66, size = 0, normalized size = 0.00

$$\int \sqrt{a^2c\,x^2+c}\,\sqrt{\arctan(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \sqrt{\mathrm{atan}\left(a\,x\right)}\,\sqrt{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{c\left(a^2x^2+1\right)}\sqrt{\mathrm{atan}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)*atan(a*x)**(1/2),x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x)), x)
```

3.725 $\int x^m \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(a x)} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^{3/2} \sqrt{\tan^{-1}(a x)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(a x)} \, dx=\int x^m \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Mathematica [A] time = 1.08, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.63, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right)^{\frac{3}{2}} x^m \sqrt{\arctan\left(a x\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m*sqrt(arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.32, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \sqrt{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.726 $\int x^2 \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(ax)} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^{3/2} \sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(ax)} \, dx = \int x^2 \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 4.03, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.59, size = 0, normalized size = 0.00

$$\int x^2 \left(a^2 c \,x^2+c\right)^{\frac{3}{2}} \sqrt{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^2*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.727 $\int x \left(c+a^2 c x^2\right)^{3/2} \sqrt{\tan^{-1}(ax)}\, dx$

Optimal. Leaf size=66

$$\frac{\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}}{5a^2c}-\frac{\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}},x\right)}{10a}$$

```
[Out] 1/5*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2)/a^2/c-1/10*Unintegrable((a^2*c*x^
2+c)^(3/2)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] ((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]])/(5*a^2*c) - Defer[Int][(c + a^2*c
*x^2)^(3/2)/Sqrt[ArcTan[a*x]], x]/(10*a)
```

Rubi steps

$$\int x \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\, dx=\frac{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}{5a^2c}-\frac{\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\, dx}{10a}$$

Mathematica [A] time = 8.12, size = 0, normalized size = 0.00

$$\int x \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A]   time = 3.15, size = 0, normalized size = 0.00

$$\int x\left(a^{2}c\,x^{2}+c\right)^{\frac{3}{2}}\sqrt{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(1/2),x)
```

```
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)*sqrt(atan(a*x)), x)
```

3.728 $\int \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=26

$$\operatorname{Int}\left(\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\,dx=\int \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\,dx$$

Mathematica [A] time = 1.77, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.59, size = 0, normalized size = 0.00

$$\int \left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \sqrt{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \sqrt{\operatorname{atan}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**(1/2),x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)*sqrt(atan(a*x)), x)
```

3.729 $\int x^m \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(ax)} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^{5/2} \sqrt{\tan^{-1}(ax)},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(ax)} \, dx=\int x^m \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(ax)} \, dx$$

Mathematica [A] time = 1.48, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(ax)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4 c^2 x^4+2\,a^2 c^2 x^2+c^2\right)\sqrt{a^2 c x^2+c}\,x^m\sqrt{\arctan\left(ax\right)},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m*sqrt(a
rctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 3.42, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \sqrt{\arctan\left(a x\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^m*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.730 $\int x^2 \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^{5/2} \sqrt{\tan^{-1}(a x)},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx=\int x^2 \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Mathematica [A] time = 3.56, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.85, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \sqrt{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^2*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.731 $\int x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}\,dx$

Optimal. Leaf size=66

$$\frac{\left(a^2cx^2+c\right)^{7/2}\sqrt{\tan^{-1}(ax)}}{7a^2c}-\frac{\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}},x\right)}{14a}$$

```
[Out] 1/7*(a^2*c*x^2+c)^(7/2)*arctan(a*x)^(1/2)/a^2/c-1/14*Unintegrable((a^2*c*x^
2+c)^(5/2)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] ((c + a^2*c*x^2)^(7/2)*Sqrt[ArcTan[a*x]])/(7*a^2*c) - Defer[Int][(c + a^2*c
*x^2)^(5/2)/Sqrt[ArcTan[a*x]], x]/(14*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}\,dx=\frac{\left(c+a^2cx^2\right)^{7/2}\sqrt{\tan^{-1}(ax)}}{7a^2c}-\frac{\int\frac{\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx}{14a}$$

Mathematica [A] time = 7.84, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.30, size = 0, normalized size = 0.00

$$\int x\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}\sqrt{\arctan\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.732 $\int \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$

Optimal. Leaf size=26

$$\text{Int}\left(\left(a^2 c x^2+c\right)^{5/2} \sqrt{\tan^{-1}(a x)},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx = \int \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Mathematica [A] time = 0.51, size = 0, normalized size = 0.00

$$\int \left(c+a^2 c x^2\right)^{5/2} \sqrt{\tan^{-1}(a x)} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.83, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \sqrt{\arctan \left(a x \right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.733 $\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m \sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
[Out] Defer[Int][(x^m*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx = \int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$$

Mathematica [A] time = 0.94, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
[Out] Integrate[(x^m*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2], x]
```

fricas [A] time = 0.62, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \sqrt{\arctan(ax)}}{\sqrt{a^2cx^2+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m*sqrt(arctan(a*x))/sqrt(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.62, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{\arctan \left(a x \right)}}{\sqrt{a^{2} c \,x^{2}+c}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2),x)
[Out] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{\operatorname{atan}{\left(a x \right)}}}{\sqrt{c \left(a^{2} x^{2} + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**m*sqrt(atan(a*x))/sqrt(c*(a**2*x**2 + 1)), x)
```

3.734 $\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=137

$$-\frac{\text{Int}\left(\frac{x^2}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{6a}+\frac{\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{3a^3}+\frac{x^2\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}{3a^2c}-\frac{2\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}{3a^4c}$$

```
[Out] -2/3*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a^4/c+1/3*x^2*(a^2*c*x^2+c)^(1/2
)*arctan(a*x)^(1/2)/a^2/c+1/3*Unintegrable(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x
)^(1/2),x)/a^3-1/6*Unintegrable(x^2/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x
)/a
```

Rubi [A] time = 0.33, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (-2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(3*a^4*c) + (x^2*Sqrt[c + a^2*c*
x^2]*Sqrt[ArcTan[a*x]])/(3*a^2*c) + Defer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt[
ArcTan[a*x]]), x]/(3*a^3) - Defer[Int][x^2/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan
[a*x]]), x]/(6*a)
```

Rubi steps

$$\begin{aligned}\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx &= \frac{x^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{3a^2c}-\frac{2\int \frac{x\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx}{3a^2}-\frac{\int \frac{x^2}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx}{6a}\\ &= -\frac{2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{3a^4c}+\frac{x^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{3a^2c}+\frac{\int \frac{1}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx}{3a^3}-\frac{\int}{}\end{aligned}$$

Mathematica [A] time = 4.50, size = 0, normalized size = 0.00

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x^3*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A]   time = 10.35, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \sqrt{\arctan \left(a x\right)}}{\sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}}}{\sqrt{c \left(a^{2} x^{2} + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**3*sqrt(atan(a*x))/sqrt(c*(a**2*x**2 + 1)), x)
```

3.735 $\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=101

$$-\frac{\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{4a}-\frac{\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)}{2a^2}+\frac{x\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}{2a^2c}$$

```
[Out] 1/2*x*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a^2/c-1/4*Unintegrable(x/(a^2*c
*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a-1/2*Unintegrable(arctan(a*x)^(1/2)/(a^
2*c*x^2+c)^(1/2),x)/a^2
```

Rubi [A] time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(2*a^2*c) - Defer[Int][x/(Sqrt[c
+ a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]/(4*a) - Defer[Int][Sqrt[ArcTan[a*x]]/Sq
rt[c + a^2*c*x^2], x]/(2*a^2)
```

Rubi steps

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx=\frac{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{2a^2c}-\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx}{2a^2}-\frac{\int \frac{x}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx}{4a}$$

Mathematica [A] time = 2.76, size = 0, normalized size = 0.00

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x^2*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 10.03, size = 0, normalized size = 0.00

$$\int \frac{x^2\sqrt{\arctan (ax)}}{\sqrt{a^2 c\, x^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{\sqrt{c\,a^2\,x^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2\sqrt{\operatorname{atan}{(ax)}}}{\sqrt{c\left(a^2x^2+1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(atan(a*x))/sqrt(c*(a**2*x**2 + 1)), x)
```

3.736 $\int \frac{x\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=63

$$\frac{\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)}}{a^2c}-\frac{\mathrm{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)}},x\right)}{2a}$$

```
[Out] (a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a^2/c-1/2*Unintegrable(1/(a^2*c*x^2+c
)^(1/2)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(a^2*c) - Defer[Int][1/(Sqrt[c + a^
2*c*x^2]*Sqrt[ArcTan[a*x]]), x]/(2*a)
```

Rubi steps

$$\int \frac{x\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx=\frac{\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}{a^2c}-\frac{\int \frac{1}{\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}\,dx}{2a}$$

Mathematica [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x*Sqrt[ArcTan[a*x]])/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.77, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\arctan(ax)}}{\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2),x)
[Out] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\operatorname{atan}{\left(ax \right)}}}{\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x*sqrt(atan(a*x))/sqrt(c*(a**2*x**2 + 1)), x)
```

3.737 $\int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)$$

[Out] Unintegrable(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

[In] Int[Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2],x]

[Out] Defer[Int][Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2], x]

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx = \int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$$

Mathematica [A] time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2],x]

[Out] Integrate[Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2], x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.53, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan\left(ax\right)}}{\sqrt{a^{2} c\, x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{\sqrt{c\,a^2\,x^2+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{\sqrt{c \left(a^{2} x^{2} + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/sqrt(c*(a**2*x**2 + 1)), x)
```

3.738 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x*Sqrt[c + a^2*c*x^2]),x]
[Out] Defer[Int][Sqrt[ArcTan[a*x]]/(x*Sqrt[c + a^2*c*x^2]), x]
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{c+a^2cx^2}}\,dx = \int \frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{c+a^2cx^2}}\,dx$$

Mathematica [A] time = 1.22, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x*Sqrt[c + a^2*c*x^2]),x]
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan \left(a x\right)}}{x \sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(a x \right)}}}{x \sqrt{c \left(a^{2} x^{2} + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(x*sqrt(c*(a**2*x**2 + 1))), x)
```

3.739 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=65

$$\frac{1}{2}a\mathrm{Int}\left(\frac{1}{x\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)}},x\right)-\frac{\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)}}{cx}$$

```
[Out] -(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/c/x+1/2*a*Unintegrable(1/x/(a^2*c*x^
2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(c*x)) + (a*Defer[Int][1/(x*Sqrt[
c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/2
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\sqrt{c+a^2cx^2}}\,dx=-\frac{\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}{cx}+\frac{1}{2}a\int \frac{1}{x\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.90, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x^2*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.98, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{x^2\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x^2\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x^2*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{x^{2}\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x**2/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(x**2*sqrt(c*(a**2*x**2 + 1))), x)
```

3.740 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=103

$$-\frac{1}{2}a^2\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{a^2cx^2+c}},x\right)+\frac{1}{4}a\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}{2cx^2}$$

```
[Out] -1/2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/c/x^2+1/4*a*Unintegrable(1/x^2/(
a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)-1/2*a^2*Unintegrable(arctan(a*x)^(1
/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.33, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(2*c*x^2) + (a*Defer[Int][1/(x^2*S
qrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/4 - (a^2*Defer[Int][Sqrt[ArcTan[
a*x]]/(x*Sqrt[c + a^2*c*x^2]), x])/2
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\sqrt{c+a^2cx^2}}\,dx=-\frac{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{2cx^2}+\frac{1}{4}a\int \frac{1}{x^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx-\frac{1}{2}a^2\int \frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 3.74, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x^3*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 5.08, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{x^3\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\mathrm{atan}(a\,x)}}{x^3\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x^3*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}(ax)}}{x^3\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(x**3*sqrt(c*(a**2*x**2 + 1))), x)
```

3.741 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=138

$$\frac{1}{6}a\text{Int}\left(\frac{1}{x^3\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{1}{3}a^3\text{Int}\left(\frac{1}{x\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{2a^2\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}{3cx}-\frac{\sqrt{a}$$

```
[Out] -1/3*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/c/x^3+2/3*a^2*(a^2*c*x^2+c)^(1/2
)*arctan(a*x)^(1/2)/c/x+1/6*a*Unintegrable(1/x^3/(a^2*c*x^2+c)^(1/2)/arctan
(a*x)^(1/2),x)-1/3*a^3*Unintegrable(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/
2),x)
```

Rubi [A] time = 0.42, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(3*c*x^3) + (2*a^2*Sqrt[c + a^2*c*
x^2]*Sqrt[ArcTan[a*x]])/(3*c*x) + (a*Defer[Int][1/(x^3*Sqrt[c + a^2*c*x^2]*
Sqrt[ArcTan[a*x]]), x])/6 - (a^3*Defer[Int][1/(x*Sqrt[c + a^2*c*x^2]*Sqrt[A
rcTan[a*x]]), x])/3
```

Rubi steps

$$\begin{aligned}\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4\sqrt{c+a^2cx^2}}\,dx &= -\frac{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{3cx^3}+\frac{1}{6}a\int \frac{1}{x^3\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx-\frac{1}{3}\left(2a^2\right)\int \frac{\sqrt{\tan^{-1}(}}{x^2\sqrt{c+a}}\\ &= -\frac{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{3cx^3}+\frac{2a^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{3cx}+\frac{1}{6}a\int \frac{1}{x^3\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}}}\end{aligned}$$

Mathematica [A] time = 21.01, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^4\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x^4*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 8.64, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan (ax)}}{x^4\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c)^(1/2),x)
[Out] int(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x^4\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x^4*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(atan(a*x)^(1/2)/(x^4*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{x^{4}\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x**4/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(sqrt(atan(a*x))/(x**4*sqrt(c*(a**2*x**2 + 1))), x)
```

3.742 $\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
[Out] Defer[Int][(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
[Out] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m\sqrt{\arctan(ax)}}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*sqrt(arctan(a*x))/(a^4*c^2*x^4 + 2*a^2*c^2
*x^2 + c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.36, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{\arctan \left(a x\right)}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
[Out] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2),x)
[Out] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{\operatorname{atan}{\left(a x \right)}}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(3/2),x)
[Out] Integral(x**m*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.743 $\int \frac{x^3 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2 c x^2\right)^{3/2}} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^3 \sqrt{\tan^{-1}(ax)}}{\left(a^2 c x^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2 c x^2\right)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
[Out] Defer[Int][(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^3 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2 c x^2\right)^{3/2}} \, dx = \int \frac{x^3 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2 c x^2\right)^{3/2}} \, dx$$

Mathematica [A] time = 27.03, size = 0, normalized size = 0.00

$$\int \frac{x^3 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2 c x^2\right)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
[Out] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 10.06, size = 0, normalized size = 0.00

$$\int \frac{x^3\sqrt{\arctan(ax)}}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^3\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\sqrt{\operatorname{atan}(ax)}}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**3*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.744 $\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
[Out] Defer[Int][(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 3.67, size = 0, normalized size = 0.00

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
[Out] Integrate[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 10.10, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \sqrt{\arctan \left(a x\right)}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \sqrt{\operatorname{atan}{\left (a x \right)}}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**2*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.745 $\int \frac{x\sqrt{\tan^{-1}(ax)}}{(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=93

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{a^2cx^2+c}}-\frac{\sqrt{\tan^{-1}(ax)}}{a^2c\sqrt{a^2cx^2+c}}$$

```
[Out] 1/2*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+
1)^(1/2)/a^2/c/(a^2*c*x^2+c)^(1/2)-arctan(a*x)^(1/2)/a^2/c/(a^2*c*x^2+c)^(1
/2)
```

Rubi [A] time = 0.18, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4930, 4905, 4904, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{a^2cx^2+c}}-\frac{\sqrt{\tan^{-1}(ax)}}{a^2c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] -(Sqrt[ArcTan[a*x]]/(a^2*c*Sqrt[c + a^2*c*x^2])) + (Sqrt[Pi/2]*Sqrt[1 + a^2
*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
```

```
0] && NeQ[q, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx &= -\frac{\sqrt{\tan^{-1}(ax)}}{a^2c\sqrt{c+a^2cx^2}}+\frac{\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{2a}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{a^2c\sqrt{c+a^2cx^2}}+\frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{2ac\sqrt{c+a^2cx^2}}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{a^2c\sqrt{c+a^2cx^2}}+\frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\cos(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{2a^2c\sqrt{c+a^2cx^2}}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{a^2c\sqrt{c+a^2cx^2}}+\frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \cos\left(x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{c+a^2cx^2}}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{a^2c\sqrt{c+a^2cx^2}}+\frac{\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{c+a^2cx^2}}
\end{aligned}
$$

Mathematica [C] time = 0.16, size = 121, normalized size = 1.30

$$\frac{-i\sqrt{a^2x^2+1}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+i\sqrt{a^2x^2+1}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)-4\tan^{-1}(ax)}{4a^2c\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(3/2),x]
[Out] (-4*ArcTan[a*x] - I*Sqrt[1 + a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I
)*ArcTan[a*x]] + I*Sqrt[1 + a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTa
n[a*x]])/(4*a^2*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 3.64, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\arctan(ax)}}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\operatorname{atan}{\left(ax \right)}}}{\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.746 $\int \frac{\sqrt{\tan^{-1}(ax)}}{(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=91

$$\frac{x\sqrt{\tan^{-1}(ax)}}{c\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{a^2cx^2+c}}$$

```
[Out] -1/2*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)+x*arctan(a*x)^(1/2)/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4905, 4904, 3296, 3305, 3351}

$$\frac{x\sqrt{\tan^{-1}(ax)}}{c\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (x*Sqrt[ArcTan[a*x]])/(c*Sqrt[c + a^2*c*x^2]) - (Sqrt[Pi/2]*Sqrt[1 + a^2*x^
2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a*c*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] && !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(1+a^2x^2\right)^{3/2}}\,dx}{c\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sqrt{x}\,\cos(x)\,dx,x,\tan^{-1}(ax)\right)}{ac\sqrt{c+a^2cx^2}}$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{2ac\sqrt{c+a^2cx^2}}$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sin\left(x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{c+a^2cx^2}}$$
$$= \frac{x\sqrt{\tan^{-1}(ax)}}{c\sqrt{c+a^2cx^2}} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.15, size = 94, normalized size = 1.03

$$\frac{\left(a^2x^2+1\right)^{3/2}\left(\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{3}{2},-i\tan^{-1}(ax)\right)+\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{3}{2},i\tan^{-1}(ax)\right)\right)}{2a\left(c\left(a^2x^2+1\right)\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^(3/2),x]
[Out] ((1 + a^2*x^2)^(3/2)*(Sqrt[(-I)*ArcTan[a*x]]*Gamma[3/2, (-I)*ArcTan[a*x]] +
 Sqrt[I*ArcTan[a*x]]*Gamma[3/2, I*ArcTan[a*x]]))/(2*a*(c*(1 + a^2*x^2))^(3/
2)*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 1.54, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan\left(ax\right)}}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\sqrt{\operatorname{atan}(a\,x)}}{\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}(ax)}}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.747 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] Defer[Int][Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(3/2)), x]
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx = \int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 2.04, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(3/2)),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.84, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{x\left(a^2c\,x^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{x\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(x*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.748 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x^2*(c + a^2*c*x^2)^(3/2)),x]
[Out] Defer[Int][Sqrt[ArcTan[a*x]]/(x^2*(c + a^2*c*x^2)^(3/2)), x]
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 6.01, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x^2*(c + a^2*c*x^2)^(3/2)),x]
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x^2*(c + a^2*c*x^2)^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A]   time = 2.19, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan (ax)}}{x^2 \left(a^2 c x^2 + c\right)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(x**2*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.749 $\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
[Out] Defer[Int][(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx=\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 1.84, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
[Out] Integrate[(x^m*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2), x]
```

fricas [A] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m\sqrt{\arctan(ax)}}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*sqrt(arctan(a*x))/(a^6*c^3*x^6 + 3*a^4*c^3
*x^4 + 3*a^2*c^3*x^2 + c^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.61, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\sqrt{\arctan\left(ax\right)}}{\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
[Out] int(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2),x)
[Out] int((x^m*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(5/2),x)
[Out] Timed out
```

3.750 $\int \frac{x^4 \sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(a^2cx^2+c\right)^{5/2}}, x\right)$$

```
[Out] Unintegrable(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^4*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] Defer[Int][(x^4*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}} dx = \int \frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Mathematica [A] time = 3.92, size = 0, normalized size = 0.00

$$\int \frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^4*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] Integrate[(x^4*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 11.63, size = 0, normalized size = 0.00

$$\int \frac{x^{4} \sqrt{\arctan\left(a x\right)}}{\left(a^{2} c\, x^{2}+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
[Out] int(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^4\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2),x)
[Out] int((x^4*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{4} \sqrt{\operatorname{atan}{\left(a x \right)}}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(5/2),x)
[Out] Integral(x**4*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.751 $\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=215

$$\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12a^4c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{\tan^{-1}(ax)}}{4a^4c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\sqrt{\mathrm{ta}}}{12a}$$

```
[Out] -1/72*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^
2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)+3/8*FresnelC(2^(1/2)/Pi^(1/2)*arctan
(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)
-3/4*arctan(a*x)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)+1/12*cos(3*arctan(a*x))*
(a^2*x^2+1)^(1/2)*arctan(a*x)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.35, antiderivative size = 215, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.231$, Rules used = {4971, 4970, 3312, 3296, 3304, 3352}

$$\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12a^4c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{\tan^{-1}(ax)}}{4a^4c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-3*Sqrt[ArcTan[a*x]])/(4*a^4*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[1 + a^2*x^2]
*Sqrt[ArcTan[a*x]]*Cos[3*ArcTan[a*x]])/(12*a^4*c^2*Sqrt[c + a^2*c*x^2]) + (
3*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(4*a
^4*c^2*Sqrt[c + a^2*c*x^2]) - (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6
/Pi]*Sqrt[ArcTan[a*x]]])/(12*a^4*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
```

```
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(1+a^2x^2\right)^{5/2}}\,dx}{c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sqrt{x}\,\sin^3(x)\,dx, x, \tan^{-1}(ax)\right)}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{3}{4}\sqrt{x}\,\sin(x)-\frac{1}{4}\sqrt{x}\,\sin(3x)\right)dx, x, \tan^{-1}(ax)\right)}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sqrt{x}\,\sin(3x)\,dx, x, \tan^{-1}(ax)\right)}{4a^4c^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \sqrt{x}\,\sin(x)\,\ldots\right.}{4a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{4a^4c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\sqrt{\tan^{-1}(ax)}\cos\left(3\tan^{-1}(ax)\right)}{12a^4c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos\ldots}{\ldots}\right.}{24a^4c^2\sqrt{c\ldots}}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{4a^4c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\sqrt{\tan^{-1}(ax)}\cos\left(3\tan^{-1}(ax)\right)}{12a^4c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \cos\ldots\right.}{12a^4c^2\ldots}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{4a^4c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\sqrt{\tan^{-1}(ax)}\cos\left(3\tan^{-1}(ax)\right)}{12a^4c^2\sqrt{c+a^2cx^2}} + \frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\ldots\right.}{4a^4c^2\sqrt{c+a^2\ldots}}$$

Mathematica [C] time = 0.53, size = 324, normalized size = 1.51

$$\frac{-144a^2x^2\tan^{-1}(ax) + ia^2x^2\sqrt{3a^2x^2+3}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-3i\tan^{-1}(ax)\right) - ia^2x^2\sqrt{3a^2x^2+3}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},\ldots\right.}{\ldots}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-96*ArcTan[a*x] - 144*a^2*x^2*ArcTan[a*x] - (27*I)*(1 + a^2*x^2)^(3/2)*Sqr
t[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] + (27*I)*(1 + a^2*x^2)^(3/
2)*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + I*Sqrt[3 + 3*a^2*x^2]*Sq
rt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] + I*a^2*x^2*Sqrt[3 + 3*
a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] - I*Sqrt[3 +
 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]] - I*a^2*x^2*S
qrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])/(144*
a^4*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 9.94, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \sqrt{\arctan (a x)}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^3*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**3*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.752 $\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=163

$$\frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(a^2cx^2+c\right)^{3/2}}-\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/72*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)-1/8*FresnelS(2^(1/2)/Pi^(1/2)*arctan(
a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)+
1/3*x^3*arctan(a*x)^(1/2)/c/(a^2*c*x^2+c)^(3/2)
```

Rubi [A] time = 0.42, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {4944, 4971, 4970, 3312, 3305, 3351}

$$-\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12a^3c^2\sqrt{a^2cx^2+c}}+\frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (x^3*Sqrt[ArcTan[a*x]])/(3*c*(c + a^2*c*x^2)^(3/2)) - (Sqrt[Pi/2]*Sqrt[1 +
a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(4*a^3*c^2*Sqrt[c + a^2*c*
x^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]
])/(12*a^3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{1}{6}a\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\left(a\sqrt{1+a^2x^2}\right)\int \frac{x^3}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{6c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin^3(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{6a^3c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{3\sin(x)}{4\sqrt{x}} - \frac{\sin(3x)}{4\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{6a^3c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(3x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{24a^3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int\right.}{8a^3c^2\sqrt{}}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sin\left(3x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{12a^3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Su}}{}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^3c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{\frac{\pi}{6}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}\right.}{12a^3c^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.27, size = 133, normalized size = 0.82

$$\frac{24a^3x^3\sqrt{\tan^{-1}(ax)} - 9\sqrt{2\pi}\left(a^2x^2+1\right)^{3/2}S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right) + \sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{72a^3c^2\left(a^2x^2+1\right)\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (24*a^3*x^3*Sqrt[ArcTan[a*x]] - 9*Sqrt[2*Pi]*(1 + a^2*x^2)^(3/2)*FresnelS[S
qrt[2/Pi]*Sqrt[ArcTan[a*x]]] + Sqrt[6*Pi]*(1 + a^2*x^2)^(3/2)*FresnelS[Sqrt
[6/Pi]*Sqrt[ArcTan[a*x]]])/(72*a^3*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 9.89, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \sqrt{\arctan \left(a x\right)}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^2*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \sqrt{\operatorname{atan}{\left(a x \right)}}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**2*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.753 $\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=163

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12a^2c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\left(a^2cx^2+c\right)^{3/2}}$$

```
[Out] 1/72*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)+1/8*FresnelC(2^(1/2)/Pi^(1/2)*arctan(
a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)-
1/3*arctan(a*x)^(1/2)/a^2/c/(a^2*c*x^2+c)^(3/2)
```

Rubi [A] time = 0.25, antiderivative size = 163, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4930, 4905, 4904, 3312, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12a^2c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] -Sqrt[ArcTan[a*x]]/(3*a^2*c*(c + a^2*c*x^2)^(3/2)) + (Sqrt[Pi/2]*Sqrt[1 + a
^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(4*a^2*c^2*Sqrt[c + a^2*c*x
^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]]
)/(12*a^2*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
```

```
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\sqrt{\tan^{-1}(ax)}}{(c+a^2cx^2)^{5/2}}\,dx &= -\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\,(c+a^2cx^2)^{3/2}}+\frac{\int \frac{1}{(c+a^2cx^2)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{6a}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\,(c+a^2cx^2)^{3/2}}+\frac{\sqrt{1+a^2x^2}\int \frac{1}{(1+a^2x^2)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{6ac^2\sqrt{c+a^2cx^2}}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\,(c+a^2cx^2)^{3/2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos^3(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{6a^2c^2\sqrt{c+a^2cx^2}}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\,(c+a^2cx^2)^{3/2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{3\cos(x)}{4\sqrt{x}}+\frac{\cos(3x)}{4\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{6a^2c^2\sqrt{c+a^2cx^2}}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\,(c+a^2cx^2)^{3/2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(3x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{24a^2c^2\sqrt{c+a^2cx^2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\right.}{8a^2c^2}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\,(c+a^2cx^2)^{3/2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \cos\left(3x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{12a^2c^2\sqrt{c+a^2cx^2}}+\frac{\sqrt{1+a^2x^2}\,\text{S}}{}\\
&= -\frac{\sqrt{\tan^{-1}(ax)}}{3a^2c\,(c+a^2cx^2)^{3/2}}+\frac{\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^2c^2\sqrt{c+a^2cx^2}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan\right.}{12a^2c^2\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [C] time = 0.44, size = 167, normalized size = 1.02

$$\frac{-48\tan^{-1}(ax)-i\left(a^2x^2+1\right)^{3/2}\left(9\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)-9\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+\sqrt{3}\left(\sqrt{-\right.\right.}{144a^2c\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*Sqrt[ArcTan[a*x]])/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-48*ArcTan[a*x] - I*(1 + a^2*x^2)^(3/2)*(9*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/
2, (-I)*ArcTan[a*x]] - 9*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + Sq
rt[3]*(Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] - Sqrt[I*ArcTa
n[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])))/(144*a^2*c*(c + a^2*c*x^2)^(3/2)*S
qrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 3.57, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{\arctan \left(a x\right)}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x*atan(a*x)^(1/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \sqrt{\operatorname{atan}{\left(a x \right)}}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(1/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x*sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.754 $\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=213

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12ac^2\sqrt{a^2cx^2+c}}+\frac{3x\sqrt{\tan^{-1}(ax)}}{4c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\sqrt{\tan^{-1}}}{12ac^2\sqrt{}}$$

```
[Out] -1/72*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^
2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)-3/8*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a
*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)+3/4
*x*arctan(a*x)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+1/12*sin(3*arctan(a*x))*(a^2*x
^2+1)^(1/2)*arctan(a*x)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 213, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {4905, 4904, 3312, 3296, 3305, 3351}

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{12ac^2\sqrt{a^2cx^2+c}}+\frac{3x\sqrt{\tan^{-1}(ax)}}{4c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\sqrt{\tan^{-1}}}{12ac^2\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (3*x*Sqrt[ArcTan[a*x]])/(4*c^2*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[Pi/2]*Sqrt[1
+ a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(4*a*c^2*Sqrt[c + a^2*c*
x^2]) - (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]
])/(12*a*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[1 + a^2*x^2]*Sqrt[ArcTan[a*x]]*Si
n[3*ArcTan[a*x]])/(12*a*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
```

```
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] && !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(1+a^2x^2\right)^{5/2}}\,dx}{c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \sqrt{x}\cos^3(x)\,dx, x, \tan^{-1}(ax)\right)}{ac^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \left(\frac{3}{4}\sqrt{x}\cos(x)+\frac{1}{4}\sqrt{x}\cos(3x)\right)dx, x, \tan^{-1}(ax)\right)}{ac^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \sqrt{x}\cos(3x)\,dx, x, \tan^{-1}(ax)\right)}{4ac^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \sqrt{x}\cos(x\ldots\right.}{4ac^2\sqrt{c+a^2cx^2}}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{4c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\sqrt{\tan^{-1}(ax)}\sin\left(3\tan^{-1}(ax)\right)}{12ac^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\sin(3\ldots}{\sqrt{x}}\right.}{24ac^2\sqrt{c+\ldots}}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{4c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\sqrt{\tan^{-1}(ax)}\sin\left(3\tan^{-1}(ax)\right)}{12ac^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \sin\left(\ldots\right.\right.}{12ac^2\sqrt{c\ldots}}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{4c^2\sqrt{c+a^2cx^2}} - \frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4ac^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{\frac{\pi}{6}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}\ldots}\right.}{12ac^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.17, size = 137, normalized size = 0.64

$$\frac{-27\sqrt{2\pi}\left(a^2x^2+1\right)^{3/2}S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+24ax\left(2a^2x^2+3\right)\sqrt{\tan\ldots}}{72c^2\left(a^3x^2+a\right)\sqrt{a^2cx^2+c}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (24*a*x*(3 + 2*a^2*x^2)*Sqrt[ArcTan[a*x]] - 27*Sqrt[2*Pi]*(1 + a^2*x^2)^(3/
2)*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] - Sqrt[6*Pi]*(1 + a^2*x^2)^(3/2)*
FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(72*c^2*(a + a^3*x^2)*Sqrt[c + a^2*
c*x^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.61, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{\left(a^2 c\, x^2+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^(1/2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.755 $\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\left(a^2cx^2+c\right)^{5/2}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] Defer[Int][Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(5/2)), x]
```

Rubi steps

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx=\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 2.32, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\tan^{-1}(ax)}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(5/2)),x]
```

```
[Out] Integrate[Sqrt[ArcTan[a*x]]/(x*(c + a^2*c*x^2)^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.89, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\arctan(ax)}}{x\left(a^2 c\, x^2+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{\mathrm{atan}\left(a\,x\right)}}{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(atan(a*x)^(1/2)/(x*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{\operatorname{atan}{\left(ax \right)}}}{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(1/2)/x/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(sqrt(atan(a*x))/(x*(c*(a**2*x**2 + 1))**(5/2)), x)
```

3.756 $\int x^m \left(c+a^2cx^2\right) \tan^{-1}(ax)^{3/2} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^m \left(a^2cx^2+c\right) \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2cx^2\right) \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right) \tan^{-1}(ax)^{3/2} \, dx = \int x^m \left(c+a^2cx^2\right) \tan^{-1}(ax)^{3/2} \, dx$$

Mathematica [A] time = 2.04, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2cx^2\right) \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2cx^2+c\right)x^m \arctan\left(ax\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m*arctan(a*x)^(3/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.50, size = 0, normalized size = 0.00

$$\int x^m \left(a^2c\,x^2+c\right) \arctan\left(ax\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}(a x)^{3/2} \left(c a^2 x^2 + c\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.757 $\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{3/2} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right) \tan^{-1}(a x)^{3/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{3/2} \, dx=\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{3/2} \, dx$$

Mathematica [A] time = 4.35, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.76, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.04

$$\int x^2 \operatorname{atan}(a\,x)^{3/2}\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^2 \operatorname{atan}^{\frac{3}{2}}(ax)\,dx + \int a^2x^4 \operatorname{atan}^{\frac{3}{2}}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)*atan(a*x)**(3/2),x)
```

```
[Out] c*(Integral(x**2*atan(a*x)**(3/2), x) + Integral(a**2*x**4*atan(a*x)**(3/2)
, x))
```

3.758 $\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=57

$$\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}{4a^2}-\frac{3\text{Int}\left(\left(a^2cx^2+c\right)\sqrt{\tan^{-1}(ax)},x\right)}{8a}$$

```
[Out] 1/4*c*(a^2*x^2+1)^2*arctan(a*x)^(3/2)/a^2-3/8*Unintegrable((a^2*c*x^2+c)*ar
ctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] (c*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2))/(4*a^2) - (3*Defer[Int][(c + a^2*c*x^
2)*Sqrt[ArcTan[a*x]], x])/(8*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx=\frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}{4a^2}-\frac{3\int\left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}\,dx}{8a}$$

Mathematica [A] time = 1.36, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.19, size = 0, normalized size = 0.00

$$\int x\left(a^{2}c\,x^{2}+c\right)\arctan\left(ax\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\mathrm{atan}\left(a\,x\right)^{3/2}\,\left(c\,a^2\,x^2+c\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)dx+\int a^{2}x^{3}\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)*atan(a*x)**(3/2),x)
```

```
[Out] c*(Integral(x*atan(a*x)**(3/2), x) + Integral(a**2*x**3*atan(a*x)**(3/2), x
))
```

3.759 $\int \left(c+a^2 c x^2\right) \tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=81

$$\frac{1}{8}c\text{Int}\left(\frac{1}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{2}{3}c\text{Int}\left(\tan^{-1}(ax)^{3/2},x\right)+\frac{1}{3}cx\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}-\frac{c\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}{4a}$$

```
[Out] 1/3*c*x*(a^2*x^2+1)*arctan(a*x)^(3/2)-1/4*c*(a^2*x^2+1)*arctan(a*x)^(1/2)/a
+2/3*c*Unintegrable(arctan(a*x)^(3/2),x)+1/8*c*Unintegrable(1/arctan(a*x)^(
1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] -(c*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]])/(4*a) + (c*x*(1 + a^2*x^2)*ArcTan[a*x]
^(3/2))/3 + (c*Defer[Int][1/Sqrt[ArcTan[a*x]], x])/8 + (2*c*Defer[Int][ArcT
an[a*x]^(3/2), x])/3
```

Rubi steps

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx=-\frac{c\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{4a}+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}+\frac{1}{8}c\int\frac{1}{\sqrt{\tan^{-1}(ax)}}$$

Mathematica [A] time = 4.30, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.80, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{\frac{3}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int {\mathrm{atan}\left(a\,x\right)}^{3/2}\,\left(c\,a^2\,x^2+c\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(atan(a*x)^(3/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int a^{2} x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(3/2),x)
```

```
[Out] c*(Integral(a**2*x**2*atan(a*x)**(3/2), x) + Integral(atan(a*x)**(3/2), x))
```

3.760 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{(a^2cx^2+c)\tan^{-1}(ax)^{3/2}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x,x]
```

```
[Out] Defer[Int][((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x}\,dx = \int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Mathematica [A] time = 1.89, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x,x]
```

```
[Out] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.11, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{\frac{3}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}\,\left(c\,a^2\,x^2+c\right)}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2))/x,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2))/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{x}\, dx + \int a^{2} x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(3/2)/x,x)
```

```
[Out] c*(Integral(atan(a*x)**(3/2)/x, x) + Integral(a**2*x*atan(a*x)**(3/2), x))
```

3.761 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{(a^2cx^2+c)\tan^{-1}(ax)^{3/2}}{x^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x^2,x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x^2,x]
```

```
[Out] Defer[Int][((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x^2, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x^2}\,dx=\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x^2}\,dx$$

Mathematica [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x^2,x]
```

```
[Out] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(3/2))/x^2, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{\frac{3}{2}}}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x^2,x)
```

```
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(3/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,\left(c\,a^2\,x^2+c\right)}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2))/x^2,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2))/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int a^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{x^{2}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(3/2)/x**2,x)
```

```
[Out] c*(Integral(a**2*atan(a*x)**(3/2), x) + Integral(atan(a*x)**(3/2)/x**2, x))
```

3.762 $\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^2 \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx = \int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx$$

Mathematica [A] time = 1.38, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4 c^2 x^4 + 2\,a^2 c^2 x^2 + c^2\right) x^m \arctan\left(ax\right)^{\frac{3}{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m*arctan(a*x)^(3/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.75, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\,x^2+c\right)^2 \arctan\left(ax\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}(a\,x)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.763 $\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)^{3/2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^2 \tan^{-1}(a x)^{3/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)^{3/2} \, dx=\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)^{3/2} \, dx$$

Mathematica [A] time = 3.31, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(a x)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.52, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^2 \operatorname{atan}(a\,x)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x^2\operatorname{atan}^{\frac{3}{2}}(ax)\,dx+\int 2a^2x^4\operatorname{atan}^{\frac{3}{2}}(ax)\,dx+\int a^4x^6\operatorname{atan}^{\frac{3}{2}}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**2*atan(a*x)**(3/2),x)
```

```
[Out] c**2*(Integral(x**2*atan(a*x)**(3/2), x) + Integral(2*a**2*x**4*atan(a*x)**
(3/2), x) + Integral(a**4*x**6*atan(a*x)**(3/2), x))
```

3.764 $\int x \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx$

Optimal. Leaf size=61

$$\frac{c^2 \left(a^2 x^2+1\right)^3 \tan^{-1}(ax)^{3/2}}{6a^2}-\frac{\text{Int}\left(\left(a^2 c x^2+c\right)^2 \sqrt{\tan^{-1}(ax)},x\right)}{4a}$$

```
[Out] 1/6*c^2*(a^2*x^2+1)^3*arctan(a*x)^(3/2)/a^2-1/4*Unintegrable((a^2*c*x^2+c)^
2*arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
```

```
[Out] (c^2*(1 + a^2*x^2)^3*ArcTan[a*x]^(3/2))/(6*a^2) - Defer[Int][(c + a^2*c*x^2
)^2*Sqrt[ArcTan[a*x]], x]/(4*a)
```

Rubi steps

$$\int x \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx=\frac{c^2 \left(1+a^2 x^2\right)^3 \tan^{-1}(ax)^{3/2}}{6a^2}-\frac{\int \left(c+a^2 c x^2\right)^2 \sqrt{\tan^{-1}(ax)} \, dx}{4a}$$

Mathematica [A] time = 1.40, size = 0, normalized size = 0.00

$$\int x \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.48, size = 0, normalized size = 0.00

$$\int x\left(a^{2}c\,x^{2}+c\right)^{2}\arctan\left(ax\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\mathrm{atan}\left(a\,x\right)^{3/2}\,\left(c\,a^2\,x^2+c\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int x\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)dx+\int 2a^{2}x^{3}\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)dx+\int a^{4}x^{5}\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2*atan(a*x)**(3/2),x)
```

```
[Out] c**2*(Integral(x*atan(a*x)**(3/2), x) + Integral(2*a**2*x**3*atan(a*x)**(3/
2), x) + Integral(a**4*x**5*atan(a*x)**(3/2), x))
```

3.765 $\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=172

$$\frac{3}{80}c\text{Int}\left(\frac{a^2cx^2+c}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{1}{10}c^2\text{Int}\left(\frac{1}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8}{15}c^2\text{Int}\left(\tan^{-1}(ax)^{3/2},x\right)+\frac{1}{5}c^2x\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}$$

```
[Out] 4/15*c^2*x*(a^2*x^2+1)*arctan(a*x)^(3/2)+1/5*c^2*x*(a^2*x^2+1)^2*arctan(a*x
)^(3/2)-1/5*c^2*(a^2*x^2+1)*arctan(a*x)^(1/2)/a-3/40*c^2*(a^2*x^2+1)^2*arct
an(a*x)^(1/2)/a+8/15*c^2*Unintegrable(arctan(a*x)^(3/2),x)+1/10*c^2*Uninteg
rable(1/arctan(a*x)^(1/2),x)+3/80*c*Unintegrable((a^2*c*x^2+c)/arctan(a*x)^
(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
```

```
[Out] -(c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]])/(5*a) - (3*c^2*(1 + a^2*x^2)^2*Sqrt[
ArcTan[a*x]])/(40*a) + (4*c^2*x*(1 + a^2*x^2)*ArcTan[a*x]^(3/2))/15 + (c^2*
x*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2))/5 + (c^2*Defer[Int][1/Sqrt[ArcTan[a*x]
], x])/10 + (3*c*Defer[Int][(c + a^2*c*x^2)/Sqrt[ArcTan[a*x]], x])/80 + (8*
c^2*Defer[Int][ArcTan[a*x]^(3/2), x])/15
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}\,dx = -\frac{3c^2\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{40a}+\frac{1}{5}c^2x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}+\frac{1}{80}(3c)\int$$

$$= -\frac{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{5a}-\frac{3c^2\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{40a}+\frac{4}{15}c^2x\left(1+a^2x^2\right.$$

Mathematica [A] time = 2.32, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.15, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int {\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int 2 a^{2} x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int a^{4} x^{4} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(3/2),x)
```

```
[Out] c**2*(Integral(2*a**2*x**2*atan(a*x)**(3/2), x) + Integral(a**4*x**4*atan(a
*x)**(3/2), x) + Integral(atan(a*x)**(3/2), x))
```

3.766 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{(a^2cx^2+c)^2 \tan^{-1}(ax)^{3/2}}{x}, x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x,x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x} dx$$

Verification is Not applicable to the result.

[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x,x]

[Out] Defer[Int][((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x, x]

Rubi steps

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x} dx = \int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x} dx$$

Mathematica [A] time = 1.86, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x} dx$$

Verification is Not applicable to the result.

[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x,x]

[Out] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x, x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x,x, algorithm="giac")

[Out] Timed out

maple [A] time = 3.13, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\, x^{2}+c\right)^{2} \arctan \left(a x\right)^{\frac{3}{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^2)/x,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^2)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{x}\, dx + \int 2 a^{2} x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int a^{4} x^{3} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(3/2)/x,x)
```

```
[Out] c**2*(Integral(atan(a*x)**(3/2)/x, x) + Integral(2*a**2*x*atan(a*x)**(3/2),
 x) + Integral(a**4*x**3*atan(a*x)**(3/2), x))
```

3.767 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{(a^2cx^2+c)^2 \tan^{-1}(ax)^{3/2}}{x^2}, x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x^2,x]
[Out] Defer[Int][((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x^2, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x^2} dx = \int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x^2} dx$$

Mathematica [A] time = 2.28, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{3/2}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x^2,x]
[Out] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2))/x^2, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.87, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{3}{2}}}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x^2,x)
```

```
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(3/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^2)/x^2,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^2)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int 2 a^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{x^{2}}\, dx + \int a^{4} x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(3/2)/x**2,x)
```

```
[Out] c**2*(Integral(2*a**2*atan(a*x)**(3/2), x) + Integral(atan(a*x)**(3/2)/x**2
, x) + Integral(a**4*x**2*atan(a*x)**(3/2), x))
```

3.768 $\int x^m \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2cx^2+c\right)^3 \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx=\int x^m \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx$$

Mathematica [A] time = 0.91, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m \arctan\left(ax\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m*arctan(a*x
)^(3/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 5.40, size = 0, normalized size = 0.00

$$\int x^m \left(a^2c\,x^2+c\right)^3 \arctan\left(ax\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}(a\,x)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.769 $\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{3/2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^3 \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{3/2} \, dx = \int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{3/2} \, dx$$

Mathematica [A] time = 3.12, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 5.71, size = 0, normalized size = 0.00

$$\int x^2 \left(a^2 c \,x^2+c\right)^3 \arctan\left(a x\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^2 \operatorname{atan}(a\,x)^{3/2}\,\left(c\,a^2\,x^2+c\right)^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3\left(\int x^2 \operatorname{atan}^{\frac{3}{2}}(ax)\,dx+\int 3a^2x^4 \operatorname{atan}^{\frac{3}{2}}(ax)\,dx+\int 3a^4x^6 \operatorname{atan}^{\frac{3}{2}}(ax)\,dx+\int a^6x^8 \operatorname{atan}^{\frac{3}{2}}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**3*atan(a*x)**(3/2),x)
```

```
[Out] c**3*(Integral(x**2*atan(a*x)**(3/2), x) + Integral(3*a**2*x**4*atan(a*x)**
(3/2), x) + Integral(3*a**4*x**6*atan(a*x)**(3/2), x) + Integral(a**6*x**8*
atan(a*x)**(3/2), x))
```

3.770 $\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=61

$$\frac{c^3\left(a^2x^2+1\right)^4\tan^{-1}(ax)^{3/2}}{8a^2}-\frac{3\mathrm{Int}\left(\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)},x\right)}{16a}$$

```
[Out] 1/8*c^3*(a^2*x^2+1)^4*arctan(a*x)^(3/2)/a^2-3/16*Unintegrable((a^2*c*x^2+c)
^3*arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
```

```
[Out] (c^3*(1 + a^2*x^2)^4*ArcTan[a*x]^(3/2))/(8*a^2) - (3*Defer[Int][(c + a^2*c*
x^2)^3*Sqrt[ArcTan[a*x]], x])/(16*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}\,dx=\frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)^{3/2}}{8a^2}-\frac{3\int\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}\,dx}{16a}$$

Mathematica [A] time = 1.46, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.30, size = 0, normalized size = 0.00

$$\int x\left(a^{2}c\,x^{2}+c\right)^{3}\arctan\left(ax\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int x\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}\,dx+\int 3a^{2}x^{3}\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}\,dx+\int 3a^{4}x^{5}\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}\,dx+\int a^{6}x^{7}\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3*atan(a*x)**(3/2),x)
```

```
[Out] c**3*(Integral(x*atan(a*x)**(3/2), x) + Integral(3*a**2*x**3*atan(a*x)**(3/
2), x) + Integral(3*a**4*x**5*atan(a*x)**(3/2), x) + Integral(a**6*x**7*ata
n(a*x)**(3/2), x))
```

3.771 $\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=259

$$\frac{9}{280}c^2\text{Int}\left(\frac{a^2cx^2+c}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{1}{56}c\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{3}{35}c^3\text{Int}\left(\frac{1}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{16}{35}c^3\text{Int}\left(\tan^{-1}(ax)^{3/2},x\right)+\frac{1}{7}$$

```
[Out] 8/35*c^3*x*(a^2*x^2+1)*arctan(a*x)^(3/2)+6/35*c^3*x*(a^2*x^2+1)^2*arctan(a*
x)^(3/2)+1/7*c^3*x*(a^2*x^2+1)^3*arctan(a*x)^(3/2)-6/35*c^3*(a^2*x^2+1)*arc
tan(a*x)^(1/2)/a-9/140*c^3*(a^2*x^2+1)^2*arctan(a*x)^(1/2)/a-1/28*c^3*(a^2*
x^2+1)^3*arctan(a*x)^(1/2)/a+16/35*c^3*Unintegrable(arctan(a*x)^(3/2),x)+3/
35*c^3*Unintegrable(1/arctan(a*x)^(1/2),x)+9/280*c^2*Unintegrable((a^2*c*x^
2+c)/arctan(a*x)^(1/2),x)+1/56*c*Unintegrable((a^2*c*x^2+c)^2/arctan(a*x)^(
1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
```

```
[Out] (-6*c^3*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]])/(35*a) - (9*c^3*(1 + a^2*x^2)^2*Sq
rt[ArcTan[a*x]])/(140*a) - (c^3*(1 + a^2*x^2)^3*Sqrt[ArcTan[a*x]])/(28*a) +
 (8*c^3*x*(1 + a^2*x^2)*ArcTan[a*x]^(3/2))/35 + (6*c^3*x*(1 + a^2*x^2)^2*Ar
cTan[a*x]^(3/2))/35 + (c^3*x*(1 + a^2*x^2)^3*ArcTan[a*x]^(3/2))/7 + (3*c^3*
Defer[Int][1/Sqrt[ArcTan[a*x]], x])/35 + (9*c^2*Defer[Int][(c + a^2*c*x^2)/
Sqrt[ArcTan[a*x]], x])/280 + (c*Defer[Int][(c + a^2*c*x^2)^2/Sqrt[ArcTan[a*
x]], x])/56 + (16*c^3*Defer[Int][ArcTan[a*x]^(3/2), x])/35
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx &= -\frac{c^3\left(1+a^2x^2\right)^3\sqrt{\tan^{-1}(ax)}}{28a}+\frac{1}{7}c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)^{3/2}+\frac{1}{56}c\int\frac{\left(c+a\right.}{\sqrt{\tan}}\\ &= -\frac{9c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{140a}-\frac{c^3\left(1+a^2x^2\right)^3\sqrt{\tan^{-1}(ax)}}{28a}+\frac{6}{35}c^3x\left(1+a^2x\right.\\ &= -\frac{6c^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{35a}-\frac{9c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{140a}-\frac{c^3\left(1+a^2x^2\right)^3}{28a}\end{aligned}$$

Mathematica [A] time = 2.41, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.80, size = 0, normalized size = 0.00

$$\int \left(a^2 c\, x^2 + c\right)^3 \arctan\left(a x\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^3 \left(\int 3a^2x^2 \operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}\, dx + \int 3a^4x^4 \operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}\, dx + \int a^6x^6 \operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}\, dx + \int \operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(3/2),x)
```

```
[Out] c**3*(Integral(3*a**2*x**2*atan(a*x)**(3/2), x) + Integral(3*a**4*x**4*atan
(a*x)**(3/2), x) + Integral(a**6*x**6*atan(a*x)**(3/2), x) + Integral(atan(
a*x)**(3/2), x))
```

3.772 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{3/2}}{x} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{(a^2cx^2+c)^3 \tan^{-1}(ax)^{3/2}}{x}, x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{3/2}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{3/2}}{x} \, dx = \int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{3/2}}{x} \, dx$$

Mathematica [A] time = 1.81, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{3/2}}{x} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x,x]
[Out] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.04, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{3}{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^3)/x,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^3)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{x}\, dx + \int 3 a^{2} x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int 3 a^{4} x^{3} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int a^{6} x^{5} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(3/2)/x,x)
```

```
[Out] c**3*(Integral(atan(a*x)**(3/2)/x, x) + Integral(3*a**2*x*atan(a*x)**(3/2),
 x) + Integral(3*a**4*x**3*atan(a*x)**(3/2), x) + Integral(a**6*x**5*atan(a
*x)**(3/2), x))
```

3.773 $\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}{x^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)^{3/2}}{x^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x^2,x]
[Out] Defer[Int][((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x^2, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}{x^2} dx = \int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}{x^2} dx$$

Mathematica [A] time = 2.78, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x^2,x]
[Out] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2))/x^2, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.30, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{3} \arctan \left(a x\right)^{\frac{3}{2}}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x^2,x)
```

```
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(3/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^3)/x^2,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^3)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int 3 a^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{x^{2}}\, dx + \int 3 a^{4} x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx + \int a^{6} x^{4} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(3/2)/x**2,x)
```

```
[Out] c**3*(Integral(3*a**2*atan(a*x)**(3/2), x) + Integral(atan(a*x)**(3/2)/x**2
, x) + Integral(3*a**4*x**2*atan(a*x)**(3/2), x) + Integral(a**6*x**4*atan(
a*x)**(3/2), x))
```

3.774 $\int \frac{x^m \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{3/2}}{a^2cx^2+c},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx = \int \frac{x^m \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx$$

Mathematica [A] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
[Out] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2), x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan\left(ax\right)^{\frac{3}{2}}}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan\left(ax\right)^{\frac{3}{2}}}{a^2c\,x^2+c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a\,x)^{3/2}}{c\,a^2\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m \operatorname{atan}^{\frac{3}{2}}(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(3/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**m*atan(a*x)**(3/2)/(a**2*x**2 + 1), x)/c
```

3.775 $\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx$

Optimal. Leaf size=61

$$\frac{2\text{Int}\left(\tan^{-1}(ax)^{5/2},x\right)}{5a^3c}+\frac{\text{Int}\left(x\tan^{-1}(ax)^{3/2},x\right)}{a^2c}-\frac{2x\tan^{-1}(ax)^{5/2}}{5a^3c}$$

```
[Out] -2/5*x*arctan(a*x)^(5/2)/a^3/c+Unintegrable(x*arctan(a*x)^(3/2),x)/a^2/c+2/
5*Unintegrable(arctan(a*x)^(5/2),x)/a^3/c
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
```

```
[Out] (-2*x*ArcTan[a*x]^(5/2))/(5*a^3*c) + Defer[Int][x*ArcTan[a*x]^(3/2), x]/(a^
2*c) + (2*Defer[Int][ArcTan[a*x]^(5/2), x])/(5*a^3*c)
```

Rubi steps

$$\begin{aligned}\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx &= -\frac{\int \frac{x\tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx}{a^2}+\frac{\int x\tan^{-1}(ax)^{3/2} dx}{a^2c}\\ &= -\frac{2x\tan^{-1}(ax)^{5/2}}{5a^3c}+\frac{2\int \tan^{-1}(ax)^{5/2} dx}{5a^3c}+\frac{\int x\tan^{-1}(ax)^{3/2} dx}{a^2c}\end{aligned}$$

Mathematica [A] time = 4.24, size = 0, normalized size = 0.00

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.57, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan\left(a x\right)^{\frac{3}{2}}}{a^{2} c \,x^{2}+c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
[Out] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{c\,a^2\,x^2+c} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2),x)
[Out] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{2} x^{2} + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(3/2)/(a**2*c*x**2+c),x)
[Out] Integral(x**3*atan(a*x)**(3/2)/(a**2*x**2 + 1), x)/c
```

3.776 $\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} \, dx$

Optimal. Leaf size=37

$$\frac{\text{Int}\left(\tan^{-1}(ax)^{3/2}, x\right)}{a^2c} - \frac{2\tan^{-1}(ax)^{5/2}}{5a^3c}$$

```
[Out] -2/5*arctan(a*x)^(5/2)/a^3/c+Unintegrable(arctan(a*x)^(3/2),x)/a^2/c
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
```

```
[Out] (-2*ArcTan[a*x]^(5/2))/(5*a^3*c) + Defer[Int][ArcTan[a*x]^(3/2), x]/(a^2*c)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} \, dx &= -\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{c+a^2cx^2} \, dx}{a^2} + \frac{\int \tan^{-1}(ax)^{3/2} \, dx}{a^2c} \\
&= -\frac{2\tan^{-1}(ax)^{5/2}}{5a^3c} + \frac{\int \tan^{-1}(ax)^{3/2} \, dx}{a^2c}
\end{aligned}$$

Mathematica [A] time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{c+a^2cx^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.35, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)^{\frac{3}{2}}}{a^2 c\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
[Out] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2\, \mathrm{atan}(a\, x)^{3/2}}{c\, a^2\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2),x)
[Out] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2 \operatorname{atan}^{\frac{3}{2}}(ax)}{a^2x^2+1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(3/2)/(a**2*c*x**2+c),x)
[Out] Integral(x**2*atan(a*x)**(3/2)/(a**2*x**2 + 1), x)/c
```

3.777 $\int \frac{x\tan^{-1}(ax)^{3/2}}{c+a^2cx^2}\,dx$

Optimal. Leaf size=41

$$\frac{2x\tan^{-1}(ax)^{5/2}}{5ac}-\frac{2\text{Int}\left(\tan^{-1}(ax)^{5/2},x\right)}{5ac}$$

```
[Out] 2/5*x*arctan(a*x)^(5/2)/a/c-2/5*Unintegrable(arctan(a*x)^(5/2),x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
```

```
[Out] (2*x*ArcTan[a*x]^(5/2))/(5*a*c) - (2*Defer[Int][ArcTan[a*x]^(5/2), x])/(5*a
*c)
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{c+a^2cx^2}\,dx=\frac{2x\tan^{-1}(ax)^{5/2}}{5ac}-\frac{2\int \tan^{-1}(ax)^{5/2}\,dx}{5ac}$$

Mathematica [A] time = 1.21, size = 0, normalized size = 0.00

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{x \arctan \left(a x\right)^{\frac{3}{2}}}{a^{2} c \,x^{2}+c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{c\,a^2\,x^2+c} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{2} x^{2} + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(3/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x*atan(a*x)**(3/2)/(a**2*x**2 + 1), x)/c
```

3.778 $\int \frac{\tan^{-1}(ax)^{3/2}}{c+a^2cx^2} \, dx$

Optimal. Leaf size=18

$$\frac{2\tan^{-1}(ax)^{5/2}}{5ac}$$

```
[Out] 2/5*arctan(a*x)^(5/2)/a/c
```

Rubi [A] time = 0.03, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4884}

$$\frac{2\tan^{-1}(ax)^{5/2}}{5ac}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2),x]
```

```
[Out] (2*ArcTan[a*x]^(5/2))/(5*a*c)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{c + a^2cx^2} \, dx = \frac{2\tan^{-1}(ax)^{5/2}}{5ac}$$

Mathematica [A] time = 0.00, size = 18, normalized size = 1.00

$$\frac{2\tan^{-1}(ax)^{5/2}}{5ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2),x]
```

```
[Out] (2*ArcTan[a*x]^(5/2))/(5*a*c)
```

fricas [A] time = 0.43, size = 14, normalized size = 0.78

$$\frac{2\,\arctan\left(ax\right)^{\frac{5}{2}}}{5\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] 2/5*arctan(a*x)^(5/2)/(a*c)
```

giac [A] time = 0.13, size = 14, normalized size = 0.78

$$\frac{2\,\arctan\left(ax\right)^{\frac{5}{2}}}{5\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] 2/5*arctan(a*x)^(5/2)/(a*c)
```

maple [A] time = 0.14, size = 15, normalized size = 0.83

$$\frac{2 \arctan (ax)^{\frac{5}{2}}}{5ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c),x)
```

```
[Out] 2/5*arctan(a*x)^(5/2)/a/c
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 0.39, size = 14, normalized size = 0.78

$$\frac{2 \operatorname{atan}(a\,x)^{5/2}}{5\,a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(c + a^2*c*x^2),x)
```

```
[Out] (2*atan(a*x)^(5/2))/(5*a*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}(ax)}{a^2x^2+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(a**2*x**2 + 1), x)/c
```

3.779 $\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)} dx$

Optimal. Leaf size=49

$$\frac{i\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x(ax+i)},x\right)}{c}-\frac{2i\tan^{-1}(ax)^{5/2}}{5c}$$

```
[Out] -2/5*I*arctan(a*x)^(5/2)/c+I*Unintegrable(arctan(a*x)^(3/2)/x/(I+a*x),x)/c
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)} dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)),x]
```

```
[Out] (((-2*I)/5)*ArcTan[a*x]^(5/2))/c + (I*Defer[Int][ArcTan[a*x]^(3/2)/(x*(I + 
a*x)), x])/c
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)} dx=-\frac{2i\tan^{-1}(ax)^{5/2}}{5c}+\frac{i\int \frac{\tan^{-1}(ax)^{3/2}}{x(i+ax)} dx}{c}$$

Mathematica [A] time = 0.66, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.55, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{3}{2}}}{x\left(a^{2}c\,x^{2}+c\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c),x)
[Out] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{x\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)),x)
[Out] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{2} x^{3} + x}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x/(a**2*c*x**2+c),x)
[Out] Integral(atan(a*x)**(3/2)/(a**2*x**3 + x), x)/c
```

3.780 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^2(c+a^2cx^2)}\,dx$

Optimal. Leaf size=36

$$\frac{\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x^2},x\right)}{c}-\frac{2a\tan^{-1}(ax)^{5/2}}{5c}$$

```
[Out] -2/5*a*arctan(a*x)^(5/2)/c+Unintegrable(arctan(a*x)^(3/2)/x^2,x)/c
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] (-2*a*ArcTan[a*x]^(5/2))/(5*c) + Defer[Int][ArcTan[a*x]^(3/2)/x^2, x]/c
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^{3/2}}{c+a^2cx^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{x^2}\,dx}{c}\\ &= -\frac{2a\tan^{-1}(ax)^{5/2}}{5c}+\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{x^2}\,dx}{c}\end{aligned}$$

Mathematica [A] time = 1.37, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.28, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(ax\right)^{\frac{3}{2}}}{x^{2} \left(a^{2}c\,x^{2}+c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}}{x^2\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{a^{2} x^{4} + x^{2}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(a**2*x**4 + x**2), x)/c
```

3.781 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^3(c+a^2cx^2)}\,dx$

Optimal. Leaf size=74

$$-\frac{ia^2\mathrm{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x(ax+i)},x\right)}{c}+\frac{\mathrm{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x^3},x\right)}{c}+\frac{2ia^2\tan^{-1}(ax)^{5/2}}{5c}$$

```
[Out] 2/5*I*a^2*arctan(a*x)^(5/2)/c+Unintegrable(arctan(a*x)^(3/2)/x^3,x)/c-I*a^2
*Unintegrable(arctan(a*x)^(3/2)/x/(I+a*x),x)/c
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] (((2*I)/5)*a^2*ArcTan[a*x]^(5/2))/c + Defer[Int][ArcTan[a*x]^(3/2)/x^3, x]/
c - (I*a^2*Defer[Int][ArcTan[a*x]^(3/2)/(x*(I + a*x)), x])/c
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{x^3}\,dx}{c}\\ &= \frac{2ia^2\tan^{-1}(ax)^{5/2}}{5c}+\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{x^3}\,dx}{c}-\frac{\left(ia^2\right)\int \frac{\tan^{-1}(ax)^{3/2}}{x(i+ax)}\,dx}{c}\end{aligned}$$

Mathematica [A] time = 1.93, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x^3*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 5.79, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{3}{2}}}{x^3(a^2c\,x^2+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)^{3/2}}{x^3\,(c\,a^2\,x^2+c)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\mathrm{atan}^{\frac{3}{2}}(ax)}{a^2x^5+x^3}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x**3/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(a**2*x**5 + x**3), x)/c
```

3.782 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^4(c+a^2cx^2)}\,dx$

Optimal. Leaf size=61

$$-\frac{a^2\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x^2},x\right)}{c}+\frac{\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x^4},x\right)}{c}+\frac{2a^3\tan^{-1}(ax)^{5/2}}{5c}$$

```
[Out] 2/5*a^3*arctan(a*x)^(5/2)/c+Unintegrable(arctan(a*x)^(3/2)/x^4,x)/c-a^2*Uni
ntegrable(arctan(a*x)^(3/2)/x^2,x)/c
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^4\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] (2*a^3*ArcTan[a*x]^(5/2))/(5*c) + Defer[Int][ArcTan[a*x]^(3/2)/x^4, x]/c -
(a^2*Defer[Int][ArcTan[a*x]^(3/2)/x^2, x])/c
```

Rubi steps

$$\begin{aligned}
\int \frac{\tan^{-1}(ax)^{3/2}}{x^4\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{x^4}\,dx}{c}\\
&= a^4\int \frac{\tan^{-1}(ax)^{3/2}}{c+a^2cx^2}\,dx+\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{x^4}\,dx}{c}-\frac{a^2\int \frac{\tan^{-1}(ax)^{3/2}}{x^2}\,dx}{c}\\
&= \frac{2a^3\tan^{-1}(ax)^{5/2}}{5c}+\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{x^4}\,dx}{c}-\frac{a^2\int \frac{\tan^{-1}(ax)^{3/2}}{x^2}\,dx}{c}
\end{aligned}$$

Mathematica [A] time = 4.04, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^4\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x^4*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [**A**] time = 3.51, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{3}{2}}}{x^4 \left(a^2 c\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c),x)
[Out] int(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{atan}\left(a\, x\right)^{3/2}}{x^4 \left(c\, a^2\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x^4*(c + a^2*c*x^2)),x)
[Out] int(atan(a*x)^(3/2)/(x^4*(c + a^2*c*x^2)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}(ax)}{a^2x^6+x^4}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x**4/(a**2*c*x**2+c),x)
[Out] Integral(atan(a*x)**(3/2)/(a**2*x**6 + x**4), x)/c
```

3.783 $\int \frac{x^m \tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^2} dx$

Optimal. Leaf size=27

$$\operatorname{Int}\left(\frac{x^m \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^2},x\right)$$

[Out] Unintegrable(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]

[Out] Defer[Int][(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2, x]

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} dx = \int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} dx$$

Mathematica [A] time = 1.45, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]

[Out] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2, x]

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{x^m \arctan(ax)^{\frac{3}{2}}}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")

[Out] integral(x^m*arctan(a*x)^(3/2)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 2.88, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{4} x^{4} + 2 a^{2} x^{2} + 1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(3/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**m*atan(a*x)**(3/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.784 $\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^2},x\right)$$

[Out] Unintegrable(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} \, dx$$

Verification is Not applicable to the result.

[In] Int[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]

[Out] Defer[Int][(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2, x]

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} \, dx = \int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} \, dx$$

Mathematica [A] time = 4.10, size = 0, normalized size = 0.00

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]

[Out] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2, x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")

[Out] sage0*x

maple [A]   time = 2.35, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2, x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{4} x^{4} + 2 a^{2} x^{2} + 1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(3/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**3*atan(a*x)**(3/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.785 $\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}\,dx$

Optimal. Leaf size=127

$$\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^3c^2}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\sqrt{\tan^{-1}(ax)}}{16a^3c^2}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(a^2x^2+1\right)}-\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(a^2x^2+1\right)}$$

```
[Out] -1/2*x*arctan(a*x)^(3/2)/a^2/c^2/(a^2*x^2+1)+1/5*arctan(a*x)^(5/2)/a^3/c^2+
3/32*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^3/c^2+3/16*arctan(a*
x)^(1/2)/a^3/c^2-3/8*arctan(a*x)^(1/2)/a^3/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.19, antiderivative size = 127, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4936, 4930, 4904, 3312, 3304, 3352}

$$\frac{3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^3c^2}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(a^2x^2+1\right)}-\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\sqrt{\tan^{-1}(ax)}}{16a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] (3*Sqrt[ArcTan[a*x]])/(16*a^3*c^2) - (3*Sqrt[ArcTan[a*x]])/(8*a^3*c^2*(1 +
a^2*x^2)) - (x*ArcTan[a*x]^(3/2))/(2*a^2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^(
5/2)/(5*a^3*c^2) + (3*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(3
2*a^3*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
```

```
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{x^2\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}dx = -\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}dx}{4a}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\int \frac{1}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}dx}{16a^2}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\,\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}dx,x,\tan^{-1}(ax\right.}{16a^3c^2}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\,\text{Subst}\left(\int\left(\frac{1}{2\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}\right)dx,x,\right.}{16a^3c^2}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{16a^3c^2}-\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\,\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\right.}{32a}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{16a^3c^2}-\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\,\text{Subst}\left(\int\cos\left(2\right.\right.}{1}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{16a^3c^2}-\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\left(1+a^2x^2\right)}-\frac{x\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{5a^3c^2}+\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax}}{\sqrt{\pi}}\right.}{32a^3c^2}$$

Mathematica [C] time = 0.39, size = 187, normalized size = 1.47

$$\frac{\frac{16\sqrt{\tan^{-1}(ax)}\left(15\left(a^2x^2-1\right)+16\left(a^2x^2+1\right)\tan^{-1}(ax)^2-40ax\tan^{-1}(ax)\right)}{a^2x^2+1}+60\left(\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)-2\sqrt{\tan^{-1}(ax)}\right)+\frac{15\left(8\tan^{-1}(ax)-i\sqrt{\right.}}{}}{1280a^3c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] ((16*Sqrt[ArcTan[a*x]]*(15*(-1 + a^2*x^2) - 40*a*x*ArcTan[a*x] + 16*(1 + a^
2*x^2)*ArcTan[a*x]^2))/(1 + a^2*x^2) + 60*(-2*Sqrt[ArcTan[a*x]] + Sqrt[Pi]*
FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]]) + (15*(8*ArcTan[a*x] - I*Sqrt[2]*
Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] + I*Sqrt[2]*Sqrt[I*Ar
cTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]]))/Sqrt[ArcTan[a*x]])/(1280*a^3*c^2
)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.49, size = 75, normalized size = 0.59

$$\frac{32\arctan(ax)^3-40\arctan(ax)^2\sin(2\arctan(ax))+15\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\operatorname{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-30\cos(}{160a^3c^2\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/160/a^3/c^2*(32*arctan(a*x)^3-40*arctan(a*x)^2*sin(2*arctan(a*x))+15*arct
an(a*x)^(1/2)*Pi^(1/2)*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))-30*cos(2*arct
an(a*x))*arctan(a*x))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{4} x^{4} + 2 a^{2} x^{2} + 1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(3/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**2*atan(a*x)**(3/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.786 $\int \frac{x\tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=109

$$-\frac{3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^2c^2}-\frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2}$$

```
[Out] 1/4*arctan(a*x)^(3/2)/a^2/c^2-1/2*arctan(a*x)^(3/2)/a^2/c^2/(a^2*x^2+1)-3/3
2*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^2+3/8*x*arctan(a*x)
^(1/2)/a/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.15, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4930, 4892, 4970, 4406, 12, 3305, 3351}

$$-\frac{3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^2c^2}-\frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] (3*x*Sqrt[ArcTan[a*x]])/(8*a*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^(3/2)/(4*a^2*
c^2) - ArcTan[a*x]^(3/2)/(2*a^2*c^2*(1 + a^2*x^2)) - (3*Sqrt[Pi]*FresnelS[(
2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(32*a^2*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
```

```
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{3\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx}{4a}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2} - \frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3}{16}\int \frac{x}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2} - \frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3\,\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}\right.}{16a^2c^2}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2} - \frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3\,\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right.}{16a^2c^2}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2} - \frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3\,\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right.}{32a^2c^2}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2} - \frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3\,\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\tan^{-}}\right.}{16a^2c^2}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{3/2}}{4a^2c^2} - \frac{\tan^{-1}(ax)^{3/2}}{2a^2c^2\left(1+a^2x^2\right)} - \frac{3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^2c^2}$$

Mathematica [A] time = 0.10, size = 75, normalized size = 0.69

$$\frac{\frac{4\sqrt{\tan^{-1}(ax)}\left(2\left(a^2x^2-1\right)\tan^{-1}(ax)+3ax\right)}{a^2x^2+1} - 3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] ((4*Sqrt[ArcTan[a*x]]*(3*a*x + 2*(-1 + a^2*x^2)*ArcTan[a*x]))/(1 + a^2*x^2)
 - 3*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(32*a^2*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.31, size = 67, normalized size = 0.61

$$-\frac{8\arctan(ax)^2\cos(2\arctan(ax))+3\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-6\sin(2\arctan(ax))\arctan(ax)}{32a^2c^2\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/32/a^2/c^2*(8*arctan(a*x)^2*cos(2*arctan(a*x))+3*arctan(a*x)^(1/2)*Pi^(1
/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))-6*sin(2*arctan(a*x))*arctan(a*x)
)/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{atan}(a\,x)^{3/2}}{\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x\,\mathrm{atan}^{\frac{3}{2}}(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(3/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x*atan(a*x)**(3/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.787 $\int \frac{\tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^2} dx$

Optimal. Leaf size=124

$$\frac{x\tan^{-1}(ax)^{3/2}}{2c^2(a^2x^2+1)}+\frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2(a^2x^2+1)}-\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32ac^2}+\frac{\tan^{-1}(ax)^{5/2}}{5ac^2}-\frac{3\sqrt{\tan^{-1}(ax)}}{16ac^2}$$

```
[Out] 1/2*x*arctan(a*x)^(3/2)/c^2/(a^2*x^2+1)+1/5*arctan(a*x)^(5/2)/a/c^2-3/32*Fr
esnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^2-3/16*arctan(a*x)^(1/2)/
a/c^2+3/8*arctan(a*x)^(1/2)/a/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.15, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4892, 4930, 4904, 3312, 3304, 3352}

$$\frac{x\tan^{-1}(ax)^{3/2}}{2c^2(a^2x^2+1)}+\frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2(a^2x^2+1)}-\frac{3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32ac^2}+\frac{\tan^{-1}(ax)^{5/2}}{5ac^2}-\frac{3\sqrt{\tan^{-1}(ax)}}{16ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-3*Sqrt[ArcTan[a*x]])/(16*a*c^2) + (3*Sqrt[ArcTan[a*x]])/(8*a*c^2*(1 + a^2
*x^2)) + (x*ArcTan[a*x]^(3/2))/(2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^(5/2)/(5
*a*c^2) - (3*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(32*a*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
```

```
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}\,dx = \frac{x\tan^{-1}(ax)^{3/2}}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{5/2}}{5ac^2} - \frac{1}{4}(3a)\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{5/2}}{5ac^2} - \frac{3}{16}\int \frac{1}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{5/2}}{5ac^2} - \frac{3\,\mathrm{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{16ac^2}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{5/2}}{5ac^2} - \frac{3\,\mathrm{Subst}\left(\int \left(\frac{1}{2\sqrt{x}} + \frac{\cos(2x)}{2\sqrt{x}}\right) dx, x, \tan\right.}{16ac^2}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{16ac^2} + \frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{5/2}}{5ac^2} - \frac{3\,\mathrm{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,d\right.}{32ac}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{16ac^2} + \frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{5/2}}{5ac^2} - \frac{3\,\mathrm{Subst}\left(\int \cos\left(2x\right.\right.}{1}$$

$$= -\frac{3\sqrt{\tan^{-1}(ax)}}{16ac^2} + \frac{3\sqrt{\tan^{-1}(ax)}}{8ac^2\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{5/2}}{5ac^2} - \frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right.}{32ac^2}$$

Mathematica [A] time = 0.18, size = 90, normalized size = 0.73

$$\frac{\frac{2\sqrt{\tan^{-1}(ax)}\left(-15a^2x^2+16\left(a^2x^2+1\right)\tan^{-1}(ax)^2+40ax\tan^{-1}(ax)+15\right)}{a^2x^2+1} - 15\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{160ac^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] ((2*Sqrt[ArcTan[a*x]]*(15 - 15*a^2*x^2 + 40*a*x*ArcTan[a*x] + 16*(1 + a^2*x
^2)*ArcTan[a*x]^2))/(1 + a^2*x^2) - 15*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x
]])/Sqrt[Pi]])/(160*a*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.53, size = 75, normalized size = 0.60

$$\frac{32\arctan(ax)^3+40\arctan(ax)^2\sin(2\arctan(ax))+30\cos(2\arctan(ax))\arctan(ax)-15\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{I}}{160a\,c^2\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/160/a/c^2/arctan(a*x)^(1/2)*(32*arctan(a*x)^3+40*arctan(a*x)^2*sin(2*arct
an(a*x))+30*cos(2*arctan(a*x))*arctan(a*x)-15*arctan(a*x)^(1/2)*Pi^(1/2)*Fr
esnelC(2*arctan(a*x)^(1/2)/Pi^(1/2)))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}(a\,x)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^2,x)
```

```
[Out] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}{(ax)}}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.788 $\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\left(a^2cx^2+c\right)^2}, x\right)$$

[Out] Unintegrable(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^2,x)

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

[In] Int[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^2),x]

[Out] Defer[Int][ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^2), x]

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^2} dx = \int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^2} dx$$

Mathematica [A] time = 1.93, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^2),x]

[Out] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^2), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^2,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^2,x, algorithm="giac")

[Out] sage0*x

maple [A] time = 2.60, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(a x\right)^{\frac{3}{2}}}{x \left(a^{2} c \,x^{2}+c \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{4} x^{5} + 2 a^{2} x^{3} + x}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(a**4*x**5 + 2*a**2*x**3 + x), x)/c**2
```

3.789 $\int \frac{x^m \tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^3} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] Defer[Int][(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3, x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3} dx = \int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3} dx$$

Mathematica [A] time = 1.87, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3, x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^{\frac{3}{2}}}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(x^m*arctan(a*x)^(3/2)/(a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2
 + c^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.49, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^{\frac{3}{2}}}{\left(a^2 c\, x^2 + c\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
[Out] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\mathrm{atan}\left(a\,x\right)^{3/2}}{\left(c\,a^2\,x^2+c\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3,x)
[Out] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(3/2)/(a**2*c*x**2+c)**3,x)
[Out] Timed out
```

3.790 $\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] Defer[Int][(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3, x]
```

Rubi steps

$$\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx = \int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx$$

Mathematica [A] time = 6.96, size = 0, normalized size = 0.00

$$\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] Integrate[(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: AttributeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] Exception raised: AttributeError >> type
```

maple [A] time = 3.46, size = 0, normalized size = 0.00

$$\int \frac{x^{5} \arctan \left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] int(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^5\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^5*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{5} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*atan(a*x)**(3/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**5*atan(a*x)**(3/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.791 $\int \frac{x^4 \tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^3} dx$

Optimal. Leaf size=230

$$-\frac{3\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^5c^3}+\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^5c^3}+\frac{3\tan^{-1}(ax)^{5/2}}{20a^5c^3}+\frac{27\sqrt{\tan^{-1}(ax)}}{256a^5c^3}+\frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(a^2x^2+1\right)^2}-\frac{x^3}{4a^2c}$$

```
[Out] -1/4*x^3*arctan(a*x)^(3/2)/a^2/c^3/(a^2*x^2+1)^2-3/8*x*arctan(a*x)^(3/2)/a^
4/c^3/(a^2*x^2+1)+3/20*arctan(a*x)^(5/2)/a^5/c^3-3/1024*FresnelC(2*2^(1/2)/
Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^5/c^3+3/32*FresnelC(2*arctan
(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^5/c^3+27/256*arctan(a*x)^(1/2)/a^5/c^3+3/3
2*x^4*arctan(a*x)^(1/2)/a/c^3/(a^2*x^2+1)^2-9/32*arctan(a*x)^(1/2)/a^5/c^3/
(a^2*x^2+1)
```

Rubi [A] time = 0.41, antiderivative size = 230, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4940, 4936, 4930, 4904, 3312, 3304, 3352, 4970}

$$-\frac{3\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^5c^3}+\frac{3\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{32a^5c^3}+\frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(a^2x^2+1\right)^2}-\frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(a^2x^2+1\right)^2}-\frac{3}{8}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (27*Sqrt[ArcTan[a*x]])/(256*a^5*c^3) + (3*x^4*Sqrt[ArcTan[a*x]])/(32*a*c^3*
(1 + a^2*x^2)^2) - (9*Sqrt[ArcTan[a*x]])/(32*a^5*c^3*(1 + a^2*x^2)) - (x^3*
ArcTan[a*x]^(3/2))/(4*a^2*c^3*(1 + a^2*x^2)^2) - (3*x*ArcTan[a*x]^(3/2))/(8
*a^4*c^3*(1 + a^2*x^2)) + (3*ArcTan[a*x]^(5/2))/(20*a^5*c^3) - (3*Sqrt[Pi/2
]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(512*a^5*c^3) + (3*Sqrt[Pi]*Fre
snelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(32*a^5*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
```

```
+ 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3}{64}\int \frac{x^4}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx + \frac{3\int \frac{x^2 \mathrm{ta}}{(c}}{}$$

$$= \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan^{-1}(ax)^{3/2}}{8a^4c^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^{5/2}}{20a^5c^3} - \frac{3\,\mathrm{Subst}}{}$$

$$= \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{9\sqrt{\tan^{-1}(ax)}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan^{-1}(ax)^{3/2}}{8a^4c^3\left(1+a^2x^2\right)} + \frac{3\tan}{2}$$

$$= -\frac{9\sqrt{\tan^{-1}(ax)}}{256a^5c^3} + \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{9\sqrt{\tan^{-1}(ax)}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan}{8a^4c^3}$$

$$= -\frac{9\sqrt{\tan^{-1}(ax)}}{256a^5c^3} + \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{9\sqrt{\tan^{-1}(ax)}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan}{8a^4c^3}$$

$$= \frac{27\sqrt{\tan^{-1}(ax)}}{256a^5c^3} + \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{9\sqrt{\tan^{-1}(ax)}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan}{8a^4c^3}$$

$$= \frac{27\sqrt{\tan^{-1}(ax)}}{256a^5c^3} + \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{9\sqrt{\tan^{-1}(ax)}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan}{8a^4c^3}$$

$$= \frac{27\sqrt{\tan^{-1}(ax)}}{256a^5c^3} + \frac{3x^4\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{9\sqrt{\tan^{-1}(ax)}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan}{8a^4c^3}$$

Mathematica [C] time = 0.86, size = 355, normalized size = 1.54

$$\frac{\frac{64\sqrt{\tan^{-1}(ax)}\left(192\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2-160ax\left(5a^2x^2+3\right)\tan^{-1}(ax)+15\left(17a^4x^4-6a^2x^2-15\right)\right)}{\left(a^2x^2+1\right)^2} - 510\left(\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right) - 8\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] ((64*Sqrt[ArcTan[a*x]]*(15*(-15 - 6*a^2*x^2 + 17*a^4*x^4) - 160*a*x*(3 + 5*
a^2*x^2)*ArcTan[a*x] + 192*(1 + a^2*x^2)^2*ArcTan[a*x]^2))/(1 + a^2*x^2)^2
- 510*(12*Sqrt[ArcTan[a*x]] + Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[
a*x]]] - 8*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]]) + 90*Sqrt[Arc
Tan[a*x]]*(8 + Gamma[1/2, (-4*I)*ArcTan[a*x]]/Sqrt[(-I)*ArcTan[a*x]] + Gamm
a[1/2, (4*I)*ArcTan[a*x]]/Sqrt[I*ArcTan[a*x]]) + (225*(24*ArcTan[a*x] - (4*
I)*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] + (4*I)*Sq
rt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] - I*Sqrt[(-I)*ArcTa
n[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + I*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (
4*I)*ArcTan[a*x]]))/Sqrt[ArcTan[a*x]])/(81920*a^5*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.71, size = 132, normalized size = 0.57

$$-15\sqrt{2}\,\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+768\arctan(ax)^3-1280\arctan(ax)^2\sin(2\arctan(ax))$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/5120/a^5/c^3*(-15*2^(1/2)*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelC(2*2^(1/2)/P
i^(1/2)*arctan(a*x)^(1/2))+768*arctan(a*x)^3-1280*arctan(a*x)^2*sin(2*arcta
n(a*x))+160*arctan(a*x)^2*sin(4*arctan(a*x))+480*arctan(a*x)^(1/2)*Pi^(1/2)
*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))-960*cos(2*arctan(a*x))*arctan(a*x)+
60*cos(4*arctan(a*x))*arctan(a*x))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^4*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4\operatorname{atan}^{\frac{3}{2}}(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**(3/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**4*atan(a*x)**(3/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.792 $\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=168

$$\frac{3\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^4c^3}-\frac{3\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{64a^4c^3}-\frac{3\tan^{-1}(ax)^{3/2}}{32a^4c^3}+\frac{3\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}(ax)\right)}{32a^4c^3}-3\sqrt{\tan^{-1}(}$$

```
[Out] -3/32*arctan(a*x)^(3/2)/a^4/c^3+1/4*x^4*arctan(a*x)^(3/2)/c^3/(a^2*x^2+1)^2
+3/1024*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^4
/c^3-3/64*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^3+3/32*sin(
2*arctan(a*x))*arctan(a*x)^(1/2)/a^4/c^3-3/256*sin(4*arctan(a*x))*arctan(a*
x)^(1/2)/a^4/c^3
```

Rubi [A] time = 0.25, antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.250$, Rules used = {4944, 4970, 3312, 3296, 3305, 3351}

$$\frac{3\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^4c^3}-\frac{3\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{64a^4c^3}+\frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(a^2x^2+1\right)^2}-\frac{3\tan^{-1}(ax)^{3/2}}{32a^4c^3}+\frac{3\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-1}\right.}{32a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-3*ArcTan[a*x]^(3/2))/(32*a^4*c^3) + (x^4*ArcTan[a*x]^(3/2))/(4*c^3*(1 + a
^2*x^2)^2) + (3*Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(512*a
^4*c^3) - (3*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(64*a^4*c^3
) + (3*Sqrt[ArcTan[a*x]]*Sin[2*ArcTan[a*x]])/(32*a^4*c^3) - (3*Sqrt[ArcTan[
a*x]]*Sin[4*ArcTan[a*x]])/(256*a^4*c^3)
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} - \frac{1}{8}(3a)\int \frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx$$

$$= \frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} - \frac{3\,\text{Subst}\left(\int \sqrt{x}\,\sin^4(x)\,dx, x, \tan^{-1}(ax)\right)}{8a^4c^3}$$

$$= \frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} - \frac{3\,\text{Subst}\left(\int \left(\frac{3\sqrt{x}}{8} - \frac{1}{2}\sqrt{x}\,\cos(2x) + \frac{1}{8}\sqrt{x}\,\cos(4x)\right)dx, x, \tan^{-1}(ax)\right)}{8a^4c^3}$$

$$= -\frac{3\tan^{-1}(ax)^{3/2}}{32a^4c^3} + \frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} - \frac{3\,\text{Subst}\left(\int \sqrt{x}\,\cos(4x)\,dx, x, \tan^{-1}(ax)\right)}{64a^4c^3} + \frac{3\,\text{Subst}}{}$$

$$= -\frac{3\tan^{-1}(ax)^{3/2}}{32a^4c^3} + \frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3\sqrt{\tan^{-1}(ax)}\,\sin\left(2\tan^{-1}(ax)\right)}{32a^4c^3} - \frac{3\sqrt{\tan^{-1}(ax)}\,\sin}{256a^4}$$

$$= -\frac{3\tan^{-1}(ax)^{3/2}}{32a^4c^3} + \frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3\sqrt{\tan^{-1}(ax)}\,\sin\left(2\tan^{-1}(ax)\right)}{32a^4c^3} - \frac{3\sqrt{\tan^{-1}(ax)}\,\sin}{256a^4}$$

$$= -\frac{3\tan^{-1}(ax)^{3/2}}{32a^4c^3} + \frac{x^4\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^4c^3} - \frac{3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{64a^4c^3} -$$

Mathematica [C] time = 0.31, size = 350, normalized size = 2.08

$$-\frac{9\left(-2\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right) - 2\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right) - \sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\,\mathrm{ta}\right.}{4096a^4c^3\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] Sqrt[ArcTan[a*x]]*((3*x*(3 + 5*a^2*x^2))/(64*a^3*c^3*(1 + a^2*x^2)^2) + ((-
3 - 6*a^2*x^2 + 5*a^4*x^4)*ArcTan[a*x])/(32*a^4*c^3*(1 + a^2*x^2)^2)) - (9*
(-2*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] - 2*Sqrt[
2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] - Sqrt[(-I)*ArcTan[a*x
```

```
]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] - Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*Ar
cTan[a*x]]))/(4096*a^4*c^3*Sqrt[ArcTan[a*x]]) - (15*(-2*Sqrt[2]*Sqrt[(-I)*A
rcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] - 2*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*
Gamma[1/2, (2*I)*ArcTan[a*x]] + Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*Ar
cTan[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]]))/(4096*a^4*
c^3*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.56, size = 124, normalized size = 0.74

$$-\frac{-3\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan (ax)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+128\arctan (ax)^2\cos (2\arctan (ax))-32\arctan (ax)^2\cos (4\,\mathrm{a}}{1024}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/1024/a^4/c^3*(-3*2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*FresnelS(2*2^(1/2)/P
i^(1/2)*arctan(a*x)^(1/2))+128*arctan(a*x)^2*cos(2*arctan(a*x))-32*arctan(a
*x)^2*cos(4*arctan(a*x))+48*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelS(2*arctan(a*
x)^(1/2)/Pi^(1/2))-96*sin(2*arctan(a*x))*arctan(a*x)+12*sin(4*arctan(a*x))*
arctan(a*x))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \operatorname{atan}^{\frac{3}{2}}(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(3/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**3*atan(a*x)**(3/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.793 $\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=108

$$\frac{3\sqrt{\frac{\pi}{2}}\, C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^3c^3}+\frac{\tan^{-1}(ax)^{5/2}}{20a^3c^3}-\frac{\tan^{-1}(ax)^{3/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3}-\frac{3\sqrt{\tan^{-1}(ax)}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3}$$

```
[Out] 1/20*arctan(a*x)^(5/2)/a^3/c^3-1/32*arctan(a*x)^(3/2)*sin(4*arctan(a*x))/a^
3/c^3+3/1024*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2
)/a^3/c^3-3/256*cos(4*arctan(a*x))*arctan(a*x)^(1/2)/a^3/c^3
```

Rubi [A] time = 0.16, antiderivative size = 108, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4970, 4406, 3296, 3304, 3352}

$$\frac{3\sqrt{\frac{\pi}{2}}\, \text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^3c^3}+\frac{\tan^{-1}(ax)^{5/2}}{20a^3c^3}-\frac{\tan^{-1}(ax)^{3/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3}-\frac{3\sqrt{\tan^{-1}(ax)}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] ArcTan[a*x]^(5/2)/(20*a^3*c^3) - (3*Sqrt[ArcTan[a*x]]*Cos[4*ArcTan[a*x]])/(
256*a^3*c^3) + (3*Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(512
*a^3*c^3) - (ArcTan[a*x]^(3/2)*Sin[4*ArcTan[a*x]])/(32*a^3*c^3)
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{\text{Subst}\left(\int x^{3/2}\cos^2(x)\sin^2(x)\,dx, x, \tan^{-1}(ax)\right)}{a^3c^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{x^{3/2}}{8} - \frac{1}{8}x^{3/2}\cos(4x)\right)dx, x, \tan^{-1}(ax)\right)}{a^3c^3}$$
$$= \frac{\tan^{-1}(ax)^{5/2}}{20a^3c^3} - \frac{\text{Subst}\left(\int x^{3/2}\cos(4x)\,dx, x, \tan^{-1}(ax)\right)}{8a^3c^3}$$
$$= \frac{\tan^{-1}(ax)^{5/2}}{20a^3c^3} - \frac{\tan^{-1}(ax)^{3/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3} + \frac{3\,\text{Subst}\left(\int \sqrt{x}\sin(4x)\,dx, x, \tan^{-1}(ax)\right)}{64a^3c^3}$$
$$= \frac{\tan^{-1}(ax)^{5/2}}{20a^3c^3} - \frac{3\sqrt{\tan^{-1}(ax)}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3} - \frac{\tan^{-1}(ax)^{3/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3} + \frac{3\,\text{Sub}}{}$$
$$= \frac{\tan^{-1}(ax)^{5/2}}{20a^3c^3} - \frac{3\sqrt{\tan^{-1}(ax)}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3} - \frac{\tan^{-1}(ax)^{3/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3} + \frac{3\,\text{Sub}}{}$$
$$= \frac{\tan^{-1}(ax)^{5/2}}{20a^3c^3} - \frac{3\sqrt{\tan^{-1}(ax)}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3} + \frac{3\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^3c^3} - \tan^{-1}(a$$

Mathematica [C] time = 0.82, size = 353, normalized size = 3.27

$$\frac{\frac{64\sqrt{\tan^{-1}(ax)}\left(64\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2+160ax\left(a^2x^2-1\right)\tan^{-1}(ax)-15\left(a^4x^4-6a^2x^2+1\right)\right)}{\left(a^2x^2+1\right)^2} + 30\left(\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right) - 8\sqrt{\pi}\,C\left(\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] ((64*Sqrt[ArcTan[a*x]]*(-15*(1 - 6*a^2*x^2 + a^4*x^4) + 160*a*x*(-1 + a^2*x
^2)*ArcTan[a*x] + 64*(1 + a^2*x^2)^2*ArcTan[a*x]^2))/(1 + a^2*x^2)^2 + 30*(
12*Sqrt[ArcTan[a*x]] + Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]]
- 8*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]]) - 90*Sqrt[ArcTan[a*x
]]*(8 + Gamma[1/2, (-4*I)*ArcTan[a*x]]/Sqrt[(-I)*ArcTan[a*x]] + Gamma[1/2,
(4*I)*ArcTan[a*x]]/Sqrt[I*ArcTan[a*x]]) + (15*(24*ArcTan[a*x] - (4*I)*Sqrt[
2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] + (4*I)*Sqrt[2]*Sq
rt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] - I*Sqrt[(-I)*ArcTan[a*x]]*
Gamma[1/2, (-4*I)*ArcTan[a*x]] + I*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*Arc
Tan[a*x]]))/Sqrt[ArcTan[a*x]])/(81920*a^3*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$sage_0x$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.50, size = 81, normalized size = 0.75

$$\frac{15\sqrt{2}\,\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+256\arctan(ax)^3-160\arctan(ax)^2\sin(4\arctan(ax))}{5120a^3c^3\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/5120/a^3/c^3*(15*2^(1/2)*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelC(2*2^(1/2)/Pi
^(1/2)*arctan(a*x)^(1/2))+256*arctan(a*x)^3-160*arctan(a*x)^2*sin(4*arctan(
a*x))-60*cos(4*arctan(a*x))*arctan(a*x))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(3/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**2*atan(a*x)**(3/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.794 $\int \frac{x\tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=168

$$-\frac{3\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^2c^3}-\frac{3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{64a^2c^3}-\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)^{3/2}}{32a^2c^3}+\frac{3\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-}\right.}{32a^2c^3}$$

```
[Out] 3/32*arctan(a*x)^(3/2)/a^2/c^3-1/4*arctan(a*x)^(3/2)/a^2/c^3/(a^2*x^2+1)^2-
3/1024*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^2/
c^3-3/64*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^3+3/32*sin(2
*arctan(a*x))*arctan(a*x)^(1/2)/a^2/c^3+3/256*sin(4*arctan(a*x))*arctan(a*x
)^(1/2)/a^2/c^3
```

Rubi [A] time = 0.19, antiderivative size = 168, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4930, 4904, 3312, 3296, 3305, 3351}

$$-\frac{3\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^2c^3}-\frac{3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{64a^2c^3}-\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{3\tan^{-1}(ax)^{3/2}}{32a^2c^3}+\frac{3\sqrt{\tan^{-1}(ax)}\sin\left(2\tan^{-}\right.}{32a^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (3*ArcTan[a*x]^(3/2))/(32*a^2*c^3) - ArcTan[a*x]^(3/2)/(4*a^2*c^3*(1 + a^2*
x^2)^2) - (3*Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(512*a^2*
c^3) - (3*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(64*a^2*c^3) +
 (3*Sqrt[ArcTan[a*x]]*Sin[2*ArcTan[a*x]])/(32*a^2*c^3) + (3*Sqrt[ArcTan[a*x
]]*Sin[4*ArcTan[a*x]])/(256*a^2*c^3)
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{3\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx}{8a}$$

$$= -\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{3\,\text{Subst}\left(\int \sqrt{x}\,\cos^4(x)\,dx,x,\tan^{-1}(ax)\right)}{8a^2c^3}$$

$$= -\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{3\,\text{Subst}\left(\int \left(\frac{3\sqrt{x}}{8}+\frac{1}{2}\sqrt{x}\,\cos(2x)+\frac{1}{8}\sqrt{x}\,\cos(4x)\right)dx,x,\tan^{-1}(ax\right.}{8a^2c^3}$$

$$= \frac{3\tan^{-1}(ax)^{3/2}}{32a^2c^3}-\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{3\,\text{Subst}\left(\int \sqrt{x}\,\cos(4x)\,dx,x,\tan^{-1}(ax)\right)}{64a^2c^3}+\frac{3\,\text{Sub}}{}$$

$$= \frac{3\tan^{-1}(ax)^{3/2}}{32a^2c^3}-\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{3\sqrt{\tan^{-1}(ax)}\,\sin\left(2\tan^{-1}(ax)\right)}{32a^2c^3}+\frac{3\sqrt{\tan^{-1}(ax)}\,\text{s}}{256}$$

$$= \frac{3\tan^{-1}(ax)^{3/2}}{32a^2c^3}-\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{3\sqrt{\tan^{-1}(ax)}\,\sin\left(2\tan^{-1}(ax)\right)}{32a^2c^3}+\frac{3\sqrt{\tan^{-1}(ax)}\,\text{s}}{256}$$

$$= \frac{3\tan^{-1}(ax)^{3/2}}{32a^2c^3}-\frac{\tan^{-1}(ax)^{3/2}}{4a^2c^3\left(1+a^2x^2\right)^2}-\frac{3\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512a^2c^3}-\frac{3\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right.}{64a^2c^3}$$

Mathematica [C] time = 0.25, size = 347, normalized size = 2.07

$$192a^4x^4\tan^{-1}(ax)^2+3a^4x^4\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}(ax)\right)+3a^4x^4\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},4i\tan^{-1}(ax)\right)+288a$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (480*a*x*ArcTan[a*x] + 288*a^3*x^3*ArcTan[a*x] - 320*ArcTan[a*x]^2 + 384*a^
2*x^2*ArcTan[a*x]^2 + 192*a^4*x^4*ArcTan[a*x]^2 + 24*Sqrt[2]*(1 + a^2*x^2)^
2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] + 24*Sqrt[2]*(1 + a
^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] + 3*Sqrt[(-I)*A
rcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + 6*a^2*x^2*Sqrt[(-I)*ArcTan[a*x
```

```
]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + 3*a^4*x^4*Sqrt[(-I)*ArcTan[a*x]]*Gamma[
1/2, (-4*I)*ArcTan[a*x]] + 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*
x]] + 6*a^2*x^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]] + 3*a^4*x
^4*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/(2048*c^3*(a + a^3*x^
2)^2*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.46, size = 124, normalized size = 0.74

$$-\frac{3\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan(ax)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+128\arctan(ax)^2\cos(2\arctan(ax))+32\arctan(ax)^2\cos(4\arctan}{1024a^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/1024/a^2/c^3*(3*2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*FresnelS(2*2^(1/2)/Pi
^(1/2)*arctan(a*x)^(1/2))+128*arctan(a*x)^2*cos(2*arctan(a*x))+32*arctan(a*
x)^2*cos(4*arctan(a*x))+48*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelS(2*arctan(a*x
)^(1/2)/Pi^(1/2))-96*sin(2*arctan(a*x))*arctan(a*x)-12*sin(4*arctan(a*x))*a
rctan(a*x))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^{\frac{3}{2}}(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(3/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x*atan(a*x)**(3/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)
/c**3
```

3.795 $\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=219

$$\frac{3x\tan^{-1}(ax)^{3/2}}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(a^2x^2+1\right)^2}+\frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(a^2x^2+1\right)}+\frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(a^2x^2+1\right)^2}-\frac{3\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512ac^3}-\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{}}{}\right.}{32a}$$

```
[Out] 1/4*x*arctan(a*x)^(3/2)/c^3/(a^2*x^2+1)^2+3/8*x*arctan(a*x)^(3/2)/c^3/(a^2*
x^2+1)+3/20*arctan(a*x)^(5/2)/a/c^3-3/1024*FresnelC(2*2^(1/2)/Pi^(1/2)*arct
an(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a/c^3-3/32*FresnelC(2*arctan(a*x)^(1/2)/Pi^
(1/2))*Pi^(1/2)/a/c^3-45/256*arctan(a*x)^(1/2)/a/c^3+3/32*arctan(a*x)^(1/2)
/a/c^3/(a^2*x^2+1)^2+9/32*arctan(a*x)^(1/2)/a/c^3/(a^2*x^2+1)
```

Rubi [A] time = 0.29, antiderivative size = 219, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.333$, Rules used = {4900, 4892, 4930, 4904, 3312, 3304, 3352}

$$\frac{3x\tan^{-1}(ax)^{3/2}}{8c^3\left(a^2x^2+1\right)}+\frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(a^2x^2+1\right)^2}+\frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(a^2x^2+1\right)}+\frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(a^2x^2+1\right)^2}-\frac{3\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{512ac^3}-\frac{3\sqrt{}}{}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-45*Sqrt[ArcTan[a*x]])/(256*a*c^3) + (3*Sqrt[ArcTan[a*x]])/(32*a*c^3*(1 +
a^2*x^2)^2) + (9*Sqrt[ArcTan[a*x]])/(32*a*c^3*(1 + a^2*x^2)) + (x*ArcTan[a*
x]^(3/2))/(4*c^3*(1 + a^2*x^2)^2) + (3*x*ArcTan[a*x]^(3/2))/(8*c^3*(1 + a^2
*x^2)) + (3*ArcTan[a*x]^(5/2))/(20*a*c^3) - (3*Sqrt[Pi/2]*FresnelC[2*Sqrt[2
/Pi]*Sqrt[ArcTan[a*x]]])/(512*a*c^3) - (3*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[
a*x]])/Sqrt[Pi]])/(32*a*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
```

```
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} - \frac{3}{64}\int \frac{1}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx + \frac{3\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}\,d}{4c}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)^{3/2}}{8c^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^{5/2}}{20ac^3} - \frac{3\,\text{Subst}\left(\int \frac{\cos^4(x}{\sqrt{x}}\right.}{64}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)^{3/2}}{8c^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^{5/2}}{20ac^3}$$

$$= -\frac{9\sqrt{\tan^{-1}(ax)}}{256ac^3} + \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)^{3/}}{8c^3\left(1+a^2x^2\right)}$$

$$= -\frac{9\sqrt{\tan^{-1}(ax)}}{256ac^3} + \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)^{3/}}{8c^3\left(1+a^2x^2\right)}$$

$$= -\frac{45\sqrt{\tan^{-1}(ax)}}{256ac^3} + \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right.}$$

$$= -\frac{45\sqrt{\tan^{-1}(ax)}}{256ac^3} + \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right.}$$

$$= -\frac{45\sqrt{\tan^{-1}(ax)}}{256ac^3} + \frac{3\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{9\sqrt{\tan^{-1}(ax)}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{3/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)}{8c^3\left(1+a^2x^2\right.}$$

Mathematica [A] time = 0.39, size = 142, normalized size = 0.65

$$\frac{\frac{4\sqrt{\tan^{-1}(ax)}\left(192\left(a^2x^2+1\right)^2\tan^{-1}(ax)^2+160ax\left(3a^2x^2+5\right)\tan^{-1}(ax)-15\left(15a^4x^4+6a^2x^2-17\right)\right)}{\left(a^2x^2+1\right)^2} - 15\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right) - 480\sqrt{\pi}}{5120ac^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] ((4*Sqrt[ArcTan[a*x]]*(-15*(-17 + 6*a^2*x^2 + 15*a^4*x^4) + 160*a*x*(5 + 3*
a^2*x^2)*ArcTan[a*x] + 192*(1 + a^2*x^2)^2*ArcTan[a*x]^2))/(1 + a^2*x^2)^2
- 15*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] - 480*Sqrt[Pi]*Fre
snelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(5120*a*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.77, size = 132, normalized size = 0.60

$$-15\sqrt{2}\,\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\,\mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+768\arctan(ax)^3+1280\arctan(ax)^2\sin(2\arctan(a$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/5120/a/c^3/arctan(a*x)^(1/2)*(-15*2^(1/2)*arctan(a*x)^(1/2)*Pi^(1/2)*Fres
nelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))+768*arctan(a*x)^3+1280*arctan(a*
x)^2*sin(2*arctan(a*x))+160*arctan(a*x)^2*sin(4*arctan(a*x))-480*arctan(a*x
)^(1/2)*Pi^(1/2)*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))+960*cos(2*arctan(a*
x))*arctan(a*x)+60*cos(4*arctan(a*x))*arctan(a*x))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{a^{6}x^{6}+3a^{4}x^{4}+3a^{2}x^{2}+1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c
**3
```

3.796 $\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] Defer[Int][ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^3), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^3}\,dx=\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Mathematica [A] time = 2.58, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^3), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.68, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{\frac{3}{2}}}{x\left(a^{2}c\,x^{2}+c\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^3,x)
```

```
[Out] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{a^{6}x^{7}+3a^{4}x^{5}+3a^{2}x^{3}+x}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(a**6*x**7 + 3*a**4*x**5 + 3*a**2*x**3 + x), x)/c
**3
```

3.797 $\int x^m \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^{3/2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \sqrt{a^2 c x^2+c} \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^m \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^{3/2} \, dx = \int x^m \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^{3/2} \, dx$$

Mathematica [A] time = 0.73, size = 0, normalized size = 0.00

$$\int x^m \sqrt{c+a^2 c x^2} \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2 c x^2+c}\, x^m \arctan\left(ax\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^(3/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.08, size = 0, normalized size = 0.00

$$\int x^m \arctan\left(ax\right)^{\frac{3}{2}} \sqrt{a^2 c\, x^2+c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^m*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m \operatorname{atan}(a x)^{3/2} \sqrt{c a^2 x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(3/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.798 $\int x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=29

$$\operatorname{Int}\left(x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^2*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}\,dx=\int x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}\,dx$$

Mathematica [A] time = 3.16, size = 0, normalized size = 0.00

$$\int x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.96, size = 0, normalized size = 0.00

$$\int x^2\arctan(ax)^{\frac{3}{2}}\sqrt{a^2c\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2 \operatorname{atan}(a\,x)^{3/2}\,\sqrt{c\,a^2\,x^2+c}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^2 \sqrt{c\left(a^2x^2+1\right)}\,\operatorname{atan}^{\frac{3}{2}}(ax)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(3/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x**2*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2), x)
```

3.799 $\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=66

$$\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{3/2}}{3a^2c}-\frac{\text{Int}\left(\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)},x\right)}{2a}$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/a^2/c-1/2*Unintegrable((a^2*c*x^2
+c)^(1/2)*arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
```

```
[Out] ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/(3*a^2*c) - Defer[Int][Sqrt[c + a
^2*c*x^2]*Sqrt[ArcTan[a*x]], x]/(2*a)
```

Rubi steps

$$\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx=\frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{3a^2c}-\frac{\int\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}\,dx}{2a}$$

Mathematica [A] time = 6.63, size = 0, normalized size = 0.00

$$\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.96, size = 0, normalized size = 0.00

$$\int x \arctan (ax)^{\frac{3}{2}} \sqrt{a^2 c x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x \operatorname{atan}(a\, x)^{3/2} \sqrt{c\, a^2\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x \sqrt{c \left(a^2 x^2 + 1\right)} \operatorname{atan}^{\frac{3}{2}}(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(3/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2), x)
```

3.800 $\int \sqrt{c+a^2cx^2}\, \tan^{-1}(ax)^{3/2}\, dx$

Optimal. Leaf size=119

$$\frac{3}{8}c\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{1}{2}c\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)+\frac{1}{2}x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}-\frac{3\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(a}}{4a}$$

```
[Out] 1/2*x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)-3/4*(a^2*c*x^2+c)^(1/2)*arctan(
a*x)^(1/2)/a+1/2*c*Unintegrable(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)+3/
8*c*Unintegrable(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
```

```
[Out] (-3*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(4*a) + (x*Sqrt[c + a^2*c*x^2]*A
rcTan[a*x]^(3/2))/2 + (3*c*Defer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*
x]]), x])/8 + (c*Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2], x])/2
```

Rubi steps

$$\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx=-\frac{3\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}{4a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}+\frac{1}{8}(3c)\int\frac{}{\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.31, size = 0, normalized size = 0.00

$$\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.42, size = 0, normalized size = 0.00

$$\int \arctan(ax)^{\frac{3}{2}} \sqrt{a^2 c\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{atan}(a\,x)^{3/2}\,\sqrt{c\,a^2\,x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{c\left(a^2x^2 + 1\right)}\,\mathrm{atan}^{\frac{3}{2}}(ax)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2), x)
```

3.801 $\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{x}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}}{x},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/x,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/x,x]
[Out] Defer[Int][(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/x, x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{x}\,dx=\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Mathematica [A] time = 3.36, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/x,x]
[Out] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.72, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{3}{2}}\sqrt{a^2cx^2+c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/x,x)
```

```
[Out] int(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}\,\sqrt{c\,a^2\,x^2+c}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2))/x,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2))/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)*(a**2*c*x**2+c)**(1/2)/x,x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2)/x, x)
```

3.802 $\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^{3/2} \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\, dx = \int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\, dx$$

Mathematica [A] time = 1.11, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right)^{\frac{3}{2}} x^m \arctan\left(ax\right)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x)^(3/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.89, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arctan\left(a x\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.803 $\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2} \, dx$

Optimal. Leaf size=29

$$\operatorname{Int}\left(x^2 \left(a^2 c x^2+c\right)^{3/2} \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2} \, dx = \int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2} \, dx$$

Mathematica [A] time = 3.90, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.85, size = 0, normalized size = 0.00

$$\int x^2 \left(a^2 c\,x^2+c\right)^{\frac{3}{2}} \arctan\left(a x\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2 \operatorname{atan}(a x)^{3/2} \left(c a^2 x^2 + c\right)^{3/2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.804 $\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=66

$$\frac{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)^{3/2}}{5a^2c}-\frac{3\text{Int}\left(\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)},x\right)}{10a}$$

```
[Out] 1/5*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2)/a^2/c-3/10*Unintegrable((a^2*c*x^
2+c)^(3/2)*arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2))/(5*a^2*c) - (3*Defer[Int][(c + a^
2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x])/(10*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}\,dx=\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{5a^2c}-\frac{3\int\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}\,dx}{10a}$$

Mathematica [A] time = 2.56, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.70, size = 0, normalized size = 0.00

$$\int x \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{3}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.805 $\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=212

$$\frac{9}{32}c^2\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{3}{8}c^2\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)+\frac{1}{16}c\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{3}{8}cx\sqrt{a^2cx^2+c}\,\tan^{-1}$$

```
[Out] 1/4*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)+3/8*c*x*arctan(a*x)^(3/2)*(a^2*
c*x^2+c)^(1/2)-1/8*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2)/a-9/16*c*(a^2*c*x^
2+c)^(1/2)*arctan(a*x)^(1/2)/a+3/8*c^2*Unintegrable(arctan(a*x)^(3/2)/(a^2*
c*x^2+c)^(1/2),x)+9/32*c^2*Unintegrable(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(
1/2),x)+1/16*c*Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] (-9*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(16*a) - ((c + a^2*c*x^2)^(3/2
)*Sqrt[ArcTan[a*x]])/(8*a) + (3*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/
8 + (x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/4 + (9*c^2*Defer[Int][1/(Sq
rt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/32 + (c*Defer[Int][Sqrt[c + a^2*c
*x^2]/Sqrt[ArcTan[a*x]], x])/16 + (3*c^2*Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[
c + a^2*c*x^2], x])/8
```

Rubi steps

$$\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\,dx = -\frac{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{8a}+\frac{1}{4}x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}+\frac{1}{16}c\int \frac{\sqrt{c+a}}{\sqrt{\tan^{-}}}$$

$$= -\frac{9c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{16a}-\frac{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{8a}+\frac{3}{8}cx\sqrt{c+a^2cx^2}\,\text{ta}$$

Mathematica [A] time = 1.49, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 1.50, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.00

$$\int {\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.806 $\int \frac{(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$

Optimal. Leaf size=29

$$\operatorname{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{3/2}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/x,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/x, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{x}\,dx=\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Mathematica [A] time = 2.25, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/x,x]
[Out] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2))/x,x)
```

```
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**(3/2)/x,x)
```

```
[Out] Timed out
```

3.807 $\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \left(a^2cx^2+c\right)^{5/2} \tan^{-1}(ax)^{3/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{3/2}\,dx = \int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{3/2}\,dx$$

Mathematica [A] time = 1.40, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.79, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m \arctan(ax)^{\frac{3}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m*arctan
(a*x)^(3/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.94, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{3}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2),x)
[Out] int(x^m*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(3/2),x)
[Out] Timed out
```

3.808 $\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x)^{3/2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^{5/2} \tan^{-1}(a x)^{3/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x)^{3/2} \, dx=\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x)^{3/2} \, dx$$

Mathematica [A] time = 3.31, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(a x)^{3/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
[Out] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.24, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2 \operatorname{atan}(a\,x)^{3/2}\,\left(c\,a^2\,x^2+c\right)^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.809 $\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=66

$$\frac{\left(a^2cx^2+c\right)^{7/2}\tan^{-1}(ax)^{3/2}}{7a^2c}-\frac{3\text{Int}\left(\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)},x\right)}{14a}$$

```
[Out] 1/7*(a^2*c*x^2+c)^(7/2)*arctan(a*x)^(3/2)/a^2/c-3/14*Unintegrable((a^2*c*x^
2+c)^(5/2)*arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] ((c + a^2*c*x^2)^(7/2)*ArcTan[a*x]^(3/2))/(7*a^2*c) - (3*Defer[Int][(c + a^
2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]], x])/(14*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx=\frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)^{3/2}}{7a^2c}-\frac{3\int\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}\,dx}{14a}$$

Mathematica [A] time = 7.35, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.98, size = 0, normalized size = 0.00

$$\int x\left(a^2c\,x^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{\frac{3}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int x\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.810 $\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx$

Optimal. Leaf size=307

$$\frac{15}{64}c^3\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{5}{16}c^3\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)+\frac{5}{96}c^2\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{\tan^{-1}(ax)}},x\right)+\frac{1}{40}c\text{Int}\left(\frac{\left(a^2cx^2+c\right)}{\sqrt{\tan^{-1}(ax)}}\right.$$

```
[Out] 5/24*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)+1/6*x*(a^2*c*x^2+c)^(5/2)*ar
ctan(a*x)^(3/2)+5/16*c^2*x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)-5/48*c*(a^
2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2)/a-1/20*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(
1/2)/a-15/32*c^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a+5/16*c^3*Unintegra
ble(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)+1/40*c*Unintegrable((a^2*c*x^2
+c)^(3/2)/arctan(a*x)^(1/2),x)+15/64*c^3*Unintegrable(1/(a^2*c*x^2+c)^(1/2)
/arctan(a*x)^(1/2),x)+5/96*c^2*Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)
^(1/2),x)
```

Rubi [A] time = 0.27, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] (-15*c^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(32*a) - (5*c*(c + a^2*c*x^
2)^(3/2)*Sqrt[ArcTan[a*x]])/(48*a) - ((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x
]])/(20*a) + (5*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/16 + (5*c*x*(c
 + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/24 + (x*(c + a^2*c*x^2)^(5/2)*ArcTan
[a*x]^(3/2))/6 + (15*c^3*Defer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]
]), x])/64 + (5*c^2*Defer[Int][Sqrt[c + a^2*c*x^2]/Sqrt[ArcTan[a*x]], x])/9
6 + (c*Defer[Int][(c + a^2*c*x^2)^(3/2)/Sqrt[ArcTan[a*x]], x])/40 + (5*c^3*
Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2], x])/16
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx &= -\frac{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}{20a}+\frac{1}{6}x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}+\frac{1}{40}c\int\frac{\left(c+a^2\right.}{\sqrt{\tan}}\\ &= -\frac{5c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{48a}-\frac{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}{20a}+\frac{5}{24}cx\left(c+a^2cx\right.\\ &= -\frac{15c^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{32a}-\frac{5c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{48a}-\frac{\left(c+a^2cx^2\right)^{5/}}{2}\end{aligned}$$

Mathematica [A] time = 0.50, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2), x]
```

fricas [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 1.59, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.00

$$\int {\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.811 $\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)^{3/2}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2)/x,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2))/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2))/x, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{x}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Mathematica [A] time = 2.35, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2))/x,x]
[Out] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2)/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.86, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2)/x,x)
[Out] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(3/2)/x,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2))/x,x)
[Out] int((atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**(3/2)/x,x)
[Out] Timed out
```

3.812 $\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{x^m \tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx = \int \frac{x^m \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Mathematica [A] time = 0.88, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
[Out] Integrate[(x^m*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [A] time = 0.99, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{x^m \arctan\left(ax\right)^{\frac{3}{2}}}{\sqrt{a^2cx^2+c}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^(3/2)/sqrt(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.18, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)^{\frac{3}{2}}}{\sqrt{a^{2} c \,x^{2}+c}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.813 $\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=168

$$\frac{\mathrm{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{8a^2}+\frac{5\mathrm{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)}{4a^3}+\frac{x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{3a^2c}-\frac{2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{3a^4c}-\frac{x\sqrt{a^2cx^2}}{}$$

```
[Out] -2/3*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a^4/c+1/3*x^2*arctan(a*x)^(3/2)*
(a^2*c*x^2+c)^(1/2)/a^2/c-1/4*x*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a^3/c
+1/8*Unintegrable(x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a^2+5/4*Uninte
grable(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)/a^3
```

Rubi [A] time = 0.45, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] -(x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(4*a^3*c) - (2*Sqrt[c + a^2*c*x^
2]*ArcTan[a*x]^(3/2))/(3*a^4*c) + (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2
))/(3*a^2*c) + Defer[Int][x/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]/(8*
a^2) + (5*Defer[Int][Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2], x])/(4*a^3)
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx=\frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{3a^2c}-\frac{2\int \frac{x\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx}{3a^2}-\frac{\int \frac{x^2\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx}{2a}$$

$$=-\frac{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{4a^3c}-\frac{2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{3a^4c}+\frac{x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{3a^2c}+$$

Mathematica [A] time = 3.73, size = 0, normalized size = 0.00

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x^3*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 9.12, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(a x\right)^{\frac{3}{2}}}{\sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.814 $\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}} dx$

Optimal. Leaf size=132

$$\frac{3\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{8a^2}-\frac{\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)}{2a^2}+\frac{x\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}}{2a^2c}-\frac{3\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}{4a^3c}$$

```
[Out] 1/2*x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a^2/c-3/4*(a^2*c*x^2+c)^(1/2)*a
rctan(a*x)^(1/2)/a^3/c-1/2*Unintegrable(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/
2),x)/a^2+3/8*Unintegrable(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a^2
```

Rubi [A] time = 0.26, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (-3*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(4*a^3*c) + (x*Sqrt[c + a^2*c*x^
2]*ArcTan[a*x]^(3/2))/(2*a^2*c) + (3*Defer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt
[ArcTan[a*x]]), x])/(8*a^2) - Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x
^2], x]/(2*a^2)
```

Rubi steps

$$\int \frac{x^2\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx=\frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{2a^2c}-\frac{\int \frac{\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx}{2a^2}-\frac{3\int \frac{x\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx}{4a}$$
$$=-\frac{3\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{4a^3c}+\frac{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{2a^2c}+\frac{3\int \frac{1}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx}{8a^2}-\int$$

Mathematica [A] time = 2.47, size = 0, normalized size = 0.00

$$\int \frac{x^2\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x^2*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 8.60, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)^{\frac{3}{2}}}{\sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 \operatorname{atan}(a\,x)^{3/2}}{\sqrt{c\,a^2\,x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2),x)
[Out] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \operatorname{atan}^{\frac{3}{2}}(ax)}{\sqrt{c\left(a^2x^2+1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x**2*atan(a*x)**(3/2)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.815 $\int \frac{x \tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}} dx$

Optimal. Leaf size=63

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{a^2c}-\frac{3\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)}{2a}$$

```
[Out] arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a^2/c-3/2*Unintegrable(arctan(a*x)^(1
/2)/(a^2*c*x^2+c)^(1/2),x)/a
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(a^2*c) - (3*Defer[Int][Sqrt[ArcTan
[a*x]]/Sqrt[c + a^2*c*x^2], x])/(2*a)
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx=\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{a^2c}-\frac{3\int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx}{2a}$$

Mathematica [A] time = 0.69, size = 0, normalized size = 0.00

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x*ArcTan[a*x]^(3/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.37, size = 0, normalized size = 0.00

$$\int \frac{x \arctan \left(a x\right)^{\frac{3}{2}}}{\sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2),x)
[Out] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{\sqrt{c \left(a^{2} x^{2} + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(x*atan(a*x)**(3/2)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.816 $\int \frac{\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2],x]
[Out] Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx = \int \frac{\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Mathematica [A] time = 0.22, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2],x]
[Out] Integrate[ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(ax\right)^{\frac{3}{2}}}{\sqrt{a^{2}c\,x^{2}+c}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{\sqrt{c \left(a^{2} x^{2} + 1\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.817 $\int \frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x*Sqrt[c + a^2*c*x^2]),x]
[Out] Defer[Int][ArcTan[a*x]^(3/2)/(x*Sqrt[c + a^2*c*x^2]), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{c+a^2cx^2}}\,dx = \int \frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{c+a^2cx^2}}\,dx$$

Mathematica [A] time = 1.33, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x*Sqrt[c + a^2*c*x^2]),x]
[Out] Integrate[ArcTan[a*x]^(3/2)/(x*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{\frac{3}{2}}}{x\sqrt{a^{2}c\,x^{2}+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{x\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{x\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(x*sqrt(c*(a**2*x**2 + 1))), x)
```

3.818 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=65

$$\frac{3}{2}a\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{a^2cx^2+c}},x\right)-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{cx}$$

```
[Out] -arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/c/x+3/2*a*Unintegrable(arctan(a*x)^(
1/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(c*x)) + (3*a*Defer[Int][Sqrt[Arc
Tan[a*x]]/(x*Sqrt[c + a^2*c*x^2]), x])/2
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\sqrt{c+a^2cx^2}}\,dx=-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{cx}+\frac{1}{2}(3a)\int \frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{c+a^2cx^2}}\,dx$$

Mathematica [A] time = 1.35, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x^2*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.96, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(ax\right)^{\frac{3}{2}}}{x^{2}\sqrt{a^{2}c\,x^{2}+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(1/2),x)

[Out] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(1/2),x)

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima: expt: undefined: 0 to a negative exponent.

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}}{x^2\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)^(1/2)),x)

[Out] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)^(1/2)), x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{x^{2}\sqrt{c\left(a^{2}x^{2}+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(atan(a*x)**(3/2)/x**2/(a**2*c*x**2+c)**(1/2),x)

[Out] Integral(atan(a*x)**(3/2)/(x**2*sqrt(c*(a**2*x**2 + 1))), x)

3.819 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=138

$$\frac{3}{8}a^2\text{Int}\left(\frac{1}{x\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{1}{2}a^2\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{a^2cx^2+c}},x\right)-\frac{3a\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}{4cx}-\frac{\sqrt{a^2cx^2+c}\tan^{-1}(a}{2cx^2}$$

```
[Out] -1/2*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/c/x^2-3/4*a*(a^2*c*x^2+c)^(1/2)*
arctan(a*x)^(1/2)/c/x-1/2*a^2*Unintegrable(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c
)^(1/2),x)+3/8*a^2*Unintegrable(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x
)
```

Rubi [A] time = 0.42, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}} =$ 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-3*a*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(4*c*x) - (Sqrt[c + a^2*c*x^2]
*ArcTan[a*x]^(3/2))/(2*c*x^2) + (3*a^2*Defer[Int][1/(x*Sqrt[c + a^2*c*x^2]*
Sqrt[ArcTan[a*x]]), x])/8 - (a^2*Defer[Int][ArcTan[a*x]^(3/2)/(x*Sqrt[c + a
^2*c*x^2]), x])/2
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\sqrt{c+a^2cx^2}}\,dx &= -\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{2cx^2}+\frac{1}{4}(3a)\int \frac{\sqrt{\tan^{-1}(ax)}}{x^2\sqrt{c+a^2cx^2}}\,dx-\frac{1}{2}a^2\int \frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{c+a^2cx^2}}\,dx\\ &= -\frac{3a\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{4cx}-\frac{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{2cx^2}+\frac{1}{8}\left(3a^2\right)\int \frac{1}{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}}}\end{aligned}$$

Mathematica [A] time = 4.20, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x^3*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.77, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{3}{2}}}{x^3\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c)^(1/2),x)
[Out] int(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{x^3\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x^3*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(atan(a*x)^(3/2)/(x^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}(ax)}{x^3\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x**3/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**(3/2)/(x**3*sqrt(c*(a**2*x**2 + 1))), x)
```

3.820 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^4\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=173

$$\frac{1}{8}a^2\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)}},x\right)-\frac{5}{4}a^3\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{a^2cx^2+c}},x\right)+\frac{2a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{3cx}-\frac{a\sqrt{a^2cx^2+c}\,\sqrt{\text{ta}}}{4cx^2}$$

```
[Out] -1/3*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/c/x^3+2/3*a^2*arctan(a*x)^(3/2)*
(a^2*c*x^2+c)^(1/2)/c/x-1/4*a*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/c/x^2+1
/8*a^2*Unintegrable(1/x^2/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)-5/4*a^3*
Unintegrable(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.66, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^4\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -(a*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(4*c*x^2) - (Sqrt[c + a^2*c*x^2]
*ArcTan[a*x]^(3/2))/(3*c*x^3) + (2*a^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2
))/(3*c*x) + (a^2*Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),
 x])/8 - (5*a^3*Defer[Int][Sqrt[ArcTan[a*x]]/(x*Sqrt[c + a^2*c*x^2]), x])/4
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{3/2}}{x^4\sqrt{c+a^2cx^2}}\,dx &= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{3cx^3}+\frac{1}{2}a\int \frac{\sqrt{\tan^{-1}(ax)}}{x^3\sqrt{c+a^2cx^2}}\,dx-\frac{1}{3}\left(2a^2\right)\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\sqrt{c+a^2cx^2}}\,dx\\ &= -\frac{a\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}{4cx^2}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{3cx^3}+\frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{3cx}+\frac{1}{8}\end{aligned}$$

Mathematica [A] time = 19.24, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^4\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[ArcTan[a*x]^(3/2)/(x^4*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 8.20, size = 0, normalized size = 0.00

$$\int \frac{\arctan (ax)^{\frac{3}{2}}}{x^4\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c)^(1/2),x)
[Out] int(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{x^4\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x^4*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(atan(a*x)^(3/2)/(x^4*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{(ax)}}{x^4\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x**4/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**(3/2)/(x**4*sqrt(c*(a**2*x**2 + 1))), x)
```

3.821 $\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{x^m \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 1.00, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
[Out] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2), x]
```

fricas [A] time = 0.93, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m \arctan(ax)^{\frac{3}{2}}}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^(3/2)/(a^4*c^2*x^4 + 2*a^2*c^2
*x^2 + c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.74, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan\left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

3.822 $\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] Defer[Int][(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx = \int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 8.38, size = 0, normalized size = 0.00

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 8.82, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan(ax)^{\frac{3}{2}}}{\left(a^2 c\, x^2 + c\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^3 \operatorname{atan}(a\,x)^{3/2}}{\left(c\,a^2\,x^2 + c\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

3.823 $\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
[Out] Defer[Int][(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 3.70, size = 0, normalized size = 0.00

$$\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
[Out] Integrate[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 8.64, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \arctan \left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**(3/2)/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.824 $\int \frac{x\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=129

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{a^2cx^2+c}}+\frac{3x\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{a^2cx^2+c}}$$

```
[Out] -arctan(a*x)^(3/2)/a^2/c/(a^2*c*x^2+c)^(1/2)-3/4*FresnelS(2^(1/2)/Pi^(1/2)*
arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c/(a^2*c*x^2+c)^(
1/2)+3/2*x*arctan(a*x)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4930, 4905, 4904, 3296, 3305, 3351}

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{a^2cx^2+c}}+\frac{3x\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (3*x*Sqrt[ArcTan[a*x]])/(2*a*c*Sqrt[c + a^2*c*x^2]) - ArcTan[a*x]^(3/2)/(a^
2*c*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/
Pi]*Sqrt[ArcTan[a*x]]])/(2*a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\begin{aligned}
\int \frac{x\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx &= -\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{c+a^2cx^2}}+\frac{3\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{2a}\\
&= -\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{c+a^2cx^2}}+\frac{\left(3\sqrt{1+a^2x^2}\right)\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(1+a^2x^2\right)^{3/2}}\,dx}{2ac\sqrt{c+a^2cx^2}}\\
&= -\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{c+a^2cx^2}}+\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \sqrt{x}\,\cos(x)\,dx,x,\tan^{-1}(ax)\right)}{2a^2c\sqrt{c+a^2cx^2}}\\
&= \frac{3x\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^2c\sqrt{c+a^2cx^2}}\\
&= \frac{3x\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \sin\left(x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{2a^2c\sqrt{c+a^2cx^2}}\\
&= \frac{3x\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{3/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c\sqrt{c+a^2cx^2}}
\end{aligned}$$

Mathematica [C] time = 0.18, size = 128, normalized size = 0.99

$$\frac{3\sqrt{a^2x^2+1}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+3\sqrt{a^2x^2+1}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+4\left(3ax-2\tan^{-1}\right.}{8a^2c\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (4*(3*a*x - 2*ArcTan[a*x])*ArcTan[a*x] + 3*Sqrt[1 + a^2*x^2]*Sqrt[(-I)*ArcT
an[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] + 3*Sqrt[1 + a^2*x^2]*Sqrt[I*ArcTan[a
*x]]*Gamma[1/2, I*ArcTan[a*x]])/(8*a^2*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*
x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 3.10, size = 0, normalized size = 0.00

$$\int \frac{x \arctan (ax)^{\frac{3}{2}}}{\left(a^{2}c\,x^{2}+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
[Out] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2),x)
[Out] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{\left(c \left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(3/2),x)
[Out] Integral(x*atan(a*x)**(3/2)/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.825 $\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=125

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^{3/2}}{c\sqrt{a^2cx^2+c}}+\frac{3\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{a^2cx^2+c}}$$

```
[Out] x*arctan(a*x)^(3/2)/c/(a^2*c*x^2+c)^(1/2)-3/4*FresnelC(2^(1/2)/Pi^(1/2)*arc
tan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)+
3/2*arctan(a*x)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4898, 4905, 4904, 3304, 3352}

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^{3/2}}{c\sqrt{a^2cx^2+c}}+\frac{3\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (3*Sqrt[ArcTan[a*x]])/(2*a*c*Sqrt[c + a^2*c*x^2]) + (x*ArcTan[a*x]^(3/2))/(
c*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi
]*Sqrt[ArcTan[a*x]]])/(2*a*c*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
```

```
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] && !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx = \frac{3\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{c\sqrt{c+a^2cx^2}} - \frac{3}{4}\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{c\sqrt{c+a^2cx^2}} - \frac{\left(3\sqrt{1+a^2x^2}\right)\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{4c\sqrt{c+a^2cx^2}}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{c\sqrt{c+a^2cx^2}} - \frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\cos(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{4ac\sqrt{c+a^2cx^2}}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{c\sqrt{c+a^2cx^2}} - \frac{\left(3\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \cos\left(x^2\right)\,dx, x, \sqrt{\tan^{-1}(ax)}\right)}{2ac\sqrt{c+a^2cx^2}}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{c\sqrt{c+a^2cx^2}} - \frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.17, size = 104, normalized size = 0.83

$$\frac{\left(a^2x^2+1\right)^{3/2}\sqrt{\tan^{-1}(ax)}\left(\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{5}{2},-i\tan^{-1}(ax)\right)+\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{5}{2},i\tan^{-1}(ax)\right)\right)}{2a\left(c\left(a^2x^2+1\right)\right)^{3/2}\sqrt{\tan^{-1}(ax)^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] ((1 + a^2*x^2)^(3/2)*Sqrt[ArcTan[a*x]]*(Sqrt[I*ArcTan[a*x]]*Gamma[5/2, (-I)
*ArcTan[a*x]] + Sqrt[(-I)*ArcTan[a*x]]*Gamma[5/2, I*ArcTan[a*x]]))/(2*a*(c*
(1 + a^2*x^2))^(3/2)*Sqrt[ArcTan[a*x]^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.42, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{\frac{3}{2}}}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.826 $\int \frac{\tan^{-1}(ax)^{3/2}}{x(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(3/2)),x]
[Out] Defer[Int][ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(3/2)), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 2.30, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(3/2)),x]
[Out] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.64, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{\frac{3}{2}}}{x\left(a^{2}c\,x^{2}+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}}{x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(x*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.827 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^2(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x^2\left(a^2cx^2+c\right)^{3/2}},x\right)$$

[Out] Unintegrable(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(3/2),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(3/2)),x]

[Out] Defer[Int][ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(3/2)), x]

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 7.54, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(3/2)),x]

[Out] Integrate[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(3/2)), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ rate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.87, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{3}{2}}}{x^2 \left(a^2 c x^2 + c\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{3/2}}{x^2\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x**2/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(x**2*(c*(a**2*x**2 + 1))**(3/2)), x)
```

3.828 $\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^{5/2}},x\right)$$

[Out] Unintegrable(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]

[Out] Defer[Int][(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2), x]

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx=\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 1.49, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]

[Out] Integrate[(x^m*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2), x]

fricas [A] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m\arctan(ax)^{\frac{3}{2}}}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^(3/2)/(a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 3.15, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan\left(ax\right)^{\frac{3}{2}}}{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
[Out] int(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2),x)
[Out] int((x^m*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(5/2),x)
[Out] Timed out
```

3.829 $\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] Defer[Int][(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} \, dx = \int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} \, dx$$

Mathematica [A] time = 9.31, size = 0, normalized size = 0.00

$$\int \frac{x^5 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] Integrate[(x^5*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 18.47, size = 0, normalized size = 0.00

$$\int \frac{x^5 \arctan(ax)^{\frac{3}{2}}}{(a^2 c x^2 + c)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^5 \operatorname{atan}(a x)^{3/2}}{(c a^2 x^2 + c)^{5/2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^5*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.830 $\int \frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(a^2cx^2+c\right)^{5/2}}, x\right)$$

```
[Out] Unintegrable(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^4*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
[Out] Defer[Int][(x^4*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} dx = \int \frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Mathematica [A] time = 3.88, size = 0, normalized size = 0.00

$$\int \frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^4*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
[Out] Integrate[(x^4*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 10.70, size = 0, normalized size = 0.00

$$\int \frac{x^{4} \arctan \left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^4\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^4*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.831 $\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=263

$$-\frac{x^2 \tan^{-1}(ax)^{3/2}}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(a^2cx^2+c\right)^{3/2}}-\frac{9\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^4c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24a^4c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -1/3*x^2*arctan(a*x)^(3/2)/a^2/c/(a^2*c*x^2+c)^(3/2)-2/3*arctan(a*x)^(3/2)/
a^4/c^2/(a^2*c*x^2+c)^(1/2)+1/144*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/
2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-9/16*Fre
snelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2
)/a^4/c^2/(a^2*c*x^2+c)^(1/2)+1/6*x^3*arctan(a*x)^(1/2)/a/c/(a^2*c*x^2+c)^(
3/2)+x*arctan(a*x)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.64, antiderivative size = 263, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {4940, 4930, 4905, 4904, 3296, 3305, 3351, 4971, 4970, 3312}

$$-\frac{9\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^4c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24a^4c^2\sqrt{a^2cx^2+c}}+\frac{x\sqrt{\tan^{-1}(ax)}}{a^3c^2\sqrt{a^2cx^2+c}}-\frac{2\tan^{-1}(ax)^{3/2}}{3a^4c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (x^3*Sqrt[ArcTan[a*x]])/(6*a*c*(c + a^2*c*x^2)^(3/2)) + (x*Sqrt[ArcTan[a*x]
])/(a^3*c^2*Sqrt[c + a^2*c*x^2]) - (x^2*ArcTan[a*x]^(3/2))/(3*a^2*c*(c + a^
2*c*x^2)^(3/2)) - (2*ArcTan[a*x]^(3/2))/(3*a^4*c^2*Sqrt[c + a^2*c*x^2]) - (
9*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(8*a
^4*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6
/Pi]*Sqrt[ArcTan[a*x]]])/(24*a^4*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{1}{12}\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx + \frac{2\int \frac{x\tan}{(c+}}{3}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^{3/2}}{3a^4c^2\sqrt{c+a^2cx^2}} + \frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{(c+a^2cx^2)^{3/2}}\,dx}{a^3c} - \frac{\sqrt{1+a^2}}{}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^{3/2}}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin^3(x}{\sqrt{x}}\right.}{12a^4c^2\sqrt{c+a}}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^{3/2}}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int\left(\frac{3\sin}{4\sqrt{}}\right.\right.}{12a^4c^2}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x\sqrt{\tan^{-1}(ax)}}{a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^{3/2}}{3a^4c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a}}{}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x\sqrt{\tan^{-1}(ax)}}{a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^{3/2}}{3a^4c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a}}{}$$

$$= \frac{x^3\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x\sqrt{\tan^{-1}(ax)}}{a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^{3/2}}{3a^4c^2\sqrt{c+a^2cx^2}} - \frac{9\sqrt{\frac{\pi}{2}}\sqrt{}}{}$$

Mathematica [C] time = 1.10, size = 272, normalized size = 1.03

$$\frac{-7\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}\sqrt{\tan^{-1}(ax)}\left(3\sqrt{3}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)\right)+24\tan^{-1}(ax)\left(ax\left(7a^2x^2+\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (24*ArcTan[a*x]*(a*x*(6 + 7*a^2*x^2) - 2*(2 + 3*a^2*x^2)*ArcTan[a*x]) - 7*S
qrt[6*Pi]*(1 + a^2*x^2)^(3/2)*Sqrt[ArcTan[a*x]]*(3*Sqrt[3]*FresnelS[Sqrt[2/
Pi]*Sqrt[ArcTan[a*x]]] - FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]]) + 3*(1 + a
^2*x^2)^(3/2)*(3*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] + 3*Sq
rt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(Sqrt[(-I)*ArcTan[a*x
]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*Ar
cTan[a*x]])))/(144*a^4*c*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 8.96, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^3*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.832 $\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}} \, dx$

Optimal. Leaf size=247

$$\frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(a^2cx^2+c\right)^{3/2}}-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24a^3c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/3*x^3*arctan(a*x)^(3/2)/c/(a^2*c*x^2+c)^(3/2)+1/144*FresnelC(6^(1/2)/Pi^(
1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x
^2+c)^(1/2)-3/16*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1
/2)*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)+3/8*arctan(a*x)^(1/2)/a^3
/c^2/(a^2*c*x^2+c)^(1/2)-1/24*cos(3*arctan(a*x))*(a^2*x^2+1)^(1/2)*arctan(a
*x)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.48, antiderivative size = 247, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {4944, 4971, 4970, 3312, 3296, 3304, 3352}

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24a^3c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\sqrt{a^2cx^2+c}}-$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (3*Sqrt[ArcTan[a*x]])/(8*a^3*c^2*Sqrt[c + a^2*c*x^2]) + (x^3*ArcTan[a*x]^(3
/2))/(3*c*(c + a^2*c*x^2)^(3/2)) - (Sqrt[1 + a^2*x^2]*Sqrt[ArcTan[a*x]]*Cos
[3*ArcTan[a*x]])/(24*a^3*c^2*Sqrt[c + a^2*c*x^2]) - (3*Sqrt[Pi/2]*Sqrt[1 +
a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(8*a^3*c^2*Sqrt[c + a^2*c*
x^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]
])/(24*a^3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{1}{2}a\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

$$= \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\left(a\sqrt{1+a^2x^2}\right)\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(1+a^2x^2\right)^{5/2}}\,dx}{2c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{1+a^2x^2}\ \text{Subst}\left(\int \sqrt{x}\,\sin^3(x)\,dx, x, \tan^{-1}(ax)\right)}{2a^3c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{1+a^2x^2}\ \text{Subst}\left(\int \left(\frac{3}{4}\sqrt{x}\,\sin(x)-\frac{1}{4}\sqrt{x}\,\sin(3x)\right)dx, x, \tan^{-1}(ax\right.}{2a^3c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{1+a^2x^2}\ \text{Subst}\left(\int \sqrt{x}\,\sin(3x)\,dx, x, \tan^{-1}(ax)\right)}{8a^3c^2\sqrt{c+a^2cx^2}} - \frac{\left(3\sqrt{1+a^2x^2}\right.}{}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{1+a^2x^2}\,\sqrt{\tan^{-1}(ax)}\,\cos\left(3\tan^{-1}(ax)\right)}{24a^3c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{}}{}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{1+a^2x^2}\,\sqrt{\tan^{-1}(ax)}\,\cos\left(3\tan^{-1}(ax)\right)}{24a^3c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{}}{}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{8a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3 \tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{\sqrt{1+a^2x^2}\,\sqrt{\tan^{-1}(ax)}\,\cos\left(3\tan^{-1}(ax)\right)}{24a^3c^2\sqrt{c+a^2cx^2}} - \frac{3}{}$$

Mathematica [C] time = 0.57, size = 338, normalized size = 1.37

$$\frac{96a^3x^3\tan^{-1}(ax)^2+144a^2x^2\tan^{-1}(ax)-ia^2x^2\sqrt{3a^2x^2+3}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-3i\tan^{-1}(ax)\right)+ia^2x^2\sqrt{3a^2x^2+3}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (96*ArcTan[a*x] + 144*a^2*x^2*ArcTan[a*x] + 96*a^3*x^3*ArcTan[a*x]^2 + (27*
I)*(1 + a^2*x^2)^(3/2)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]]
- (27*I)*(1 + a^2*x^2)^(3/2)*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]]
- I*Sqrt[3 + 3*a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x
]] - I*a^2*x^2*Sqrt[3 + 3*a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)
*ArcTan[a*x]] + I*Sqrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*
ArcTan[a*x]] + I*a^2*x^2*Sqrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2,
 (3*I)*ArcTan[a*x]])/(288*a^3*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*Sqrt[Ar
cTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 8.99, size = 0, normalized size = 0.00

$$\int \frac{x^2\arctan(ax)^{\frac{3}{2}}}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2 \operatorname{atan}(a\,x)^{3/2}}{\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^2*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 \operatorname{atan}^{\frac{3}{2}}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(x**2*atan(a*x)**(3/2)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.833 $\int \frac{x\tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=248

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^2c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24a^2c^2\sqrt{a^2cx^2+c}}+\frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\sqrt{\tan^{-}}}{24a^2c^{}}$$

```
[Out] -1/3*arctan(a*x)^(3/2)/a^2/c/(a^2*c*x^2+c)^(3/2)-1/144*FresnelS(6^(1/2)/Pi^
(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*
x^2+c)^(1/2)-3/16*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(
1/2)*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)+3/8*x*arctan(a*x)^(1/2)/
a/c^2/(a^2*c*x^2+c)^(1/2)+1/24*sin(3*arctan(a*x))*(a^2*x^2+1)^(1/2)*arctan(
a*x)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.28, antiderivative size = 248, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}} = 0.292$, Rules used = {4930, 4905, 4904, 3312, 3296, 3305, 3351}

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^2c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24a^2c^2\sqrt{a^2cx^2+c}}+\frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{a^2x^2+1}\sqrt{\tan^{-}}}{24a^2c^{}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (3*x*Sqrt[ArcTan[a*x]])/(8*a*c^2*Sqrt[c + a^2*c*x^2]) - ArcTan[a*x]^(3/2)/(
3*a^2*c*(c + a^2*c*x^2)^(3/2)) - (3*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelS[S
qrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(8*a^2*c^2*Sqrt[c + a^2*c*x^2]) - (Sqrt[Pi/6]
*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(24*a^2*c^2*Sqrt
[c + a^2*c*x^2]) + (Sqrt[1 + a^2*x^2]*Sqrt[ArcTan[a*x]]*Sin[3*ArcTan[a*x]])
/(24*a^2*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = -\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx}{2a}$$

$$= -\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\sqrt{1+a^2x^2}\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(1+a^2x^2\right)^{5/2}}\,dx}{2ac^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sqrt{x}\cos^3(x)\,dx,x,\tan^{-1}(ax)\right)}{2a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{3}{4}\sqrt{x}\cos(x)+\frac{1}{4}\sqrt{x}\cos(3x)\right)dx,x,\tan^{-1}\right.}{2a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sqrt{x}\cos(3x)\,dx,x,\tan^{-1}(ax)\right)}{8a^2c^2\sqrt{c+a^2cx^2}}+\frac{\left(3\sqrt{1+a^2\right.}{}$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\sqrt{1+a^2x^2}\sqrt{\tan^{-1}(ax)}\sin\left(3\tan^{-1}(ax)\right)}{24a^2c^2\sqrt{c+a^2cx^2}}-$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}+\frac{\sqrt{1+a^2x^2}\sqrt{\tan^{-1}(ax)}\sin\left(3\tan^{-1}(ax)\right)}{24a^2c^2\sqrt{c+a^2cx^2}}-$$

$$= \frac{3x\sqrt{\tan^{-1}(ax)}}{8ac^2\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{3/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^2c^2\sqrt{c+a^2cx^2}}-\sqrt{\frac{\pi}{6}}$$

Mathematica [C] time = 1.05, size = 261, normalized size = 1.05

$$\frac{48\left(2a^3x^3+3ax-2\tan^{-1}(ax)\right)\tan^{-1}(ax)-4\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}\sqrt{\tan^{-1}(ax)}\left(3\sqrt{3}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-S\left(\sqrt{\frac{6}{\pi}}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^(3/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (48*(3*a*x + 2*a^3*x^3 - 2*ArcTan[a*x])*ArcTan[a*x] - 4*Sqrt[6*Pi]*(1 + a^2
*x^2)^(3/2)*Sqrt[ArcTan[a*x]]*(3*Sqrt[3]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*
x]]] - FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]]) + 3*(1 + a^2*x^2)^(3/2)*(3*S
qrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] + 3*Sqrt[I*ArcTan[a*x]]*
Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*
I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])))/(288
*a^2*c*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 3.16, size = 0, normalized size = 0.00

$$\int \frac{x\arctan\left(ax\right)^{\frac{3}{2}}}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^{3/2}}{\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2),x)
[Out] int((x*atan(a*x)^(3/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(3/2)/(a**2*c*x**2+c)**(5/2),x)
[Out] Integral(x*atan(a*x)**(3/2)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.834 $\int \frac{\tan^{-1}(ax)^{3/2}}{(c+a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=252

$$-\frac{9\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\tan^{-1}(ax)}}{ac^2\sqrt{a^2cx^2+c}}+$$

```
[Out] 1/3*x*arctan(a*x)^(3/2)/c/(a^2*c*x^2+c)^(3/2)+2/3*x*arctan(a*x)^(3/2)/c^2/(
a^2*c*x^2+c)^(1/2)-1/144*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/
2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)-9/16*FresnelC(2^(1/
2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c^2/(a^
2*c*x^2+c)^(1/2)+1/6*arctan(a*x)^(1/2)/a/c/(a^2*c*x^2+c)^(3/2)+arctan(a*x)^
(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.35, antiderivative size = 252, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4900, 4898, 4905, 4904, 3304, 3352, 3312}

$$-\frac{9\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{24ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{a^2cx^2+c}}+$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] Sqrt[ArcTan[a*x]]/(6*a*c*(c + a^2*c*x^2)^(3/2)) + Sqrt[ArcTan[a*x]]/(a*c^2*
Sqrt[c + a^2*c*x^2]) + (x*ArcTan[a*x]^(3/2))/(3*c*(c + a^2*c*x^2)^(3/2)) +
(2*x*ArcTan[a*x]^(3/2))/(3*c^2*Sqrt[c + a^2*c*x^2]) - (9*Sqrt[Pi/2]*Sqrt[1
+ a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(8*a*c^2*Sqrt[c + a^2*c*
x^2]) - (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]
])/(24*a*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] && !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x\tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{1}{12}\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx + \frac{2\int \frac{\tan^{-1}}{(c+a}\cdots}{3\cdots}$$

$$= \frac{\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{\tan^{-1}(ax)}}{ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{\int \frac{}{(c+a^2cx^2)}\cdots}{\cdots}$$

$$= \frac{\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{\tan^{-1}(ax)}}{ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\cdots}{\cdots}$$

$$= \frac{\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{\tan^{-1}(ax)}}{ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\cdots}{\cdots}$$

$$= \frac{\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{\tan^{-1}(ax)}}{ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\cdots}{\cdots}$$

$$= \frac{\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{\tan^{-1}(ax)}}{ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{\frac{\pi}{2}}\sqrt{1+\cdots}}{\cdots}$$

$$= \frac{\sqrt{\tan^{-1}(ax)}}{6ac\left(c+a^2cx^2\right)^{3/2}} + \frac{\sqrt{\tan^{-1}(ax)}}{ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{3/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{3/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{9\sqrt{\frac{\pi}{2}}\sqrt{1-\cdots}}{\cdots}$$

Mathematica [A] time = 0.21, size = 153, normalized size = 0.61

$$\frac{-81\sqrt{2\pi}\left(a^2x^2+1\right)^{3/2}C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right) - \sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right) + 24\sqrt{\tan^{-1}(ax)}\left(\left(4a^3x\cdots\right.\right.}{144c^2\left(a^3x^2+a\right)\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (24*Sqrt[ArcTan[a*x]]*(7 + 6*a^2*x^2 + (6*a*x + 4*a^3*x^3)*ArcTan[a*x]) - 8
1*Sqrt[2*Pi]*(1 + a^2*x^2)^(3/2)*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] - S
qrt[6*Pi]*(1 + a^2*x^2)^(3/2)*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(144*
c^2*(a + a^3*x^2)*Sqrt[c + a^2*c*x^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.56, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(a x\right)^{\frac{3}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^(3/2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}(ax)}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.835 $\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\left(a^2cx^2+c\right)^{5/2}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(5/2)),x]
[Out] Defer[Int][ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(5/2)), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx=\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 2.51, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(5/2)),x]
[Out] Integrate[ArcTan[a*x]^(3/2)/(x*(c + a^2*c*x^2)^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(ax\right)^{\frac{3}{2}}}{x \left(a^{2} c \,x^{2}+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(atan(a*x)^(3/2)/(x*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)**(3/2)/(x*(c*(a**2*x**2 + 1))**(5/2)), x)
```

3.836 $\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x^2\left(a^2cx^2+c\right)^{5/2}},x\right)$$

[Out] Unintegrable(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(5/2),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(5/2)),x]

[Out] Defer[Int][ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(5/2)), x]

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx = \int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 8.66, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(5/2)),x]

[Out] Integrate[ArcTan[a*x]^(3/2)/(x^2*(c + a^2*c*x^2)^(5/2)), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.90, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(a x\right)^{\frac{3}{2}}}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(5/2),x)
[Out] int(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(3/2)/x^2/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{3/2}}{x^2\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(atan(a*x)^(3/2)/(x^2*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(3/2)/x**2/(a**2*c*x**2+c)**(5/2),x)
[Out] Timed out
```

3.837 $\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right) \tan^{-1}(a x)^{5/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx=\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$$

Mathematica [A] time = 2.04, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x^m*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right) x^m \arctan\left(a x\right)^{\frac{5}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*x^m*arctan(a*x)^(5/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.88, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\,x^2+c\right) \arctan\left(a x\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}(a\,x)^{5/2}\,\left(c\,a^2\,x^2+c\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.838 $\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right) \tan^{-1}(a x)^{5/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx=\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$$

Mathematica [A] time = 3.69, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right) \tan^{-1}(a x)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x^2*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.27, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^2 \operatorname{atan}(a x)^{5/2} \left(c a^2 x^2 + c\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int x^2 \operatorname{atan}^{\frac{5}{2}}(ax)\, dx + \int a^2x^4 \operatorname{atan}^{\frac{5}{2}}(ax)\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)*atan(a*x)**(5/2),x)
```

```
[Out] c*(Integral(x**2*atan(a*x)**(5/2), x) + Integral(a**2*x**4*atan(a*x)**(5/2)
, x))
```

3.839 $\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=117

$$-\frac{5c\text{Int}\left(\frac{1}{\sqrt{\tan^{-1}(ax)}},x\right)}{64a}-\frac{5c\text{Int}\left(\tan^{-1}(ax)^{3/2},x\right)}{12a}+\frac{c\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{5/2}}{4a^2}-\frac{5cx\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}{24a}+\frac{5c\left(a^2x^2\right.}{}$$

```
[Out] -5/24*c*x*(a^2*x^2+1)*arctan(a*x)^(3/2)/a+1/4*c*(a^2*x^2+1)^2*arctan(a*x)^(
5/2)/a^2+5/32*c*(a^2*x^2+1)*arctan(a*x)^(1/2)/a^2-5/12*c*Unintegrable(arcta
n(a*x)^(3/2),x)/a-5/64*c*Unintegrable(1/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] (5*c*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]])/(32*a^2) - (5*c*x*(1 + a^2*x^2)*ArcTa
n[a*x]^(3/2))/(24*a) + (c*(1 + a^2*x^2)^2*ArcTan[a*x]^(5/2))/(4*a^2) - (5*c
*Defer[Int][1/Sqrt[ArcTan[a*x]], x])/(64*a) - (5*c*Defer[Int][ArcTan[a*x]^(
3/2), x])/(12*a)
```

Rubi steps

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx=\frac{c\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{5/2}}{4a^2}-\frac{5\int\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}\,dx}{8a}$$

$$=\frac{5c\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{32a^2}-\frac{5cx\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}{24a}+\frac{c\left(1+a^2x^2\right)^2\tan^{-1}(}{4a^2}$$

Mathematica [A] time = 2.10, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.77, size = 0, normalized size = 0.00

$$\int x\left(a^{2} c\,x^{2}+c\right) \arctan\left(a x\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\mathrm{atan}\left(a\,x\right)^{5/2}\,\left(c\,a^2\,x^2+c\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int a^{2} x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)*atan(a*x)**(5/2),x)
```

```
[Out] c*(Integral(x*atan(a*x)**(5/2), x) + Integral(a**2*x**3*atan(a*x)**(5/2), x
))
```

3.840 $\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=81

$$\frac{5}{8}c\mathrm{Int}\left(\sqrt{\tan^{-1}(ax)},x\right)+\frac{2}{3}c\mathrm{Int}\left(\tan^{-1}(ax)^{5/2},x\right)+\frac{1}{3}cx\left(a^2x^2+1\right)\tan^{-1}(ax)^{5/2}-\frac{5c\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}{12a}$$

```
[Out] -5/12*c*(a^2*x^2+1)*arctan(a*x)^(3/2)/a+1/3*c*x*(a^2*x^2+1)*arctan(a*x)^(5/
2)+2/3*c*Unintegrable(arctan(a*x)^(5/2),x)+5/8*c*Unintegrable(arctan(a*x)^(
1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] (-5*c*(1 + a^2*x^2)*ArcTan[a*x]^(3/2))/(12*a) + (c*x*(1 + a^2*x^2)*ArcTan[a
*x]^(5/2))/3 + (5*c*Defer[Int][Sqrt[ArcTan[a*x]], x])/8 + (2*c*Defer[Int][A
rcTan[a*x]^(5/2), x])/3
```

Rubi steps

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx=-\frac{5c\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}{12a}+\frac{1}{3}cx\left(1+a^2x^2\right)\tan^{-1}(ax)^{5/2}+\frac{1}{8}(5c)\int \sqrt{\tan^{-1}(ax}$$

Mathematica [A] time = 3.99, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.60, size = 0, normalized size = 0.00

$$\int \left(a^{2} c\,x^{2}+c\right) \arctan \left(a x\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int {\mathrm{atan}\left(a\,x\right)}^{5/2}\,\left(c\,a^2\,x^2+c\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)*(c + a^2*c*x^2),x)
```

```
[Out] int(atan(a*x)^(5/2)*(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int a^{2} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(5/2),x)
```

```
[Out] c*(Integral(a**2*x**2*atan(a*x)**(5/2), x) + Integral(atan(a*x)**(5/2), x))
```

3.841 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}{x}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)\tan^{-1}(ax)^{5/2}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x}\,dx=\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Mathematica [A] time = 3.17, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x,x]
[Out] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.84, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{\frac{5}{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,\left(c\,a^2\,x^2+c\right)}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2))/x,x)
```

```
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2))/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{x}\, dx + \int a^{2} x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(5/2)/x,x)
```

```
[Out] c*(Integral(atan(a*x)**(5/2)/x, x) + Integral(a**2*x*atan(a*x)**(5/2), x))
```

3.842 $\int \frac{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}{x^2}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)\tan^{-1}(ax)^{5/2}}{x^2},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x^2,x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x^2,x]
[Out] Defer[Int][((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x^2, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x^2}\,dx=\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x^2}\,dx$$

Mathematica [A] time = 1.81, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x^2,x]
[Out] Integrate[((c + a^2*c*x^2)*ArcTan[a*x]^(5/2))/x^2, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.95, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right) \arctan \left(a x \right)^{\frac{5}{2}}}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x^2,x)
[Out] int((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)*arctan(a*x)^(5/2)/x^2,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,\left(c\,a^2\,x^2+c\right)}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2))/x^2,x)
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2))/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int a^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{x^{2}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)*atan(a*x)**(5/2)/x**2,x)
[Out] c*(Integral(a**2*atan(a*x)**(5/2), x) + Integral(atan(a*x)**(5/2)/x**2, x))
```

3.843 $\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^2 \tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx = \int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$$

Mathematica [A] time = 1.42, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4 c^2 x^4 + 2\,a^2 c^2 x^2 + c^2\right) x^m \arctan\left(ax\right)^{\frac{5}{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m*arctan(a*x)^(5/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.29, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\, x^2+c\right)^2 \arctan\left(ax\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}(a\,x)^{5/2} \left(c\,a^2\,x^2+c\right)^2 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.844 $\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^2 \tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx = \int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$$

Mathematica [A] time = 2.74, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.00, size = 0, normalized size = 0.00

$$\int x^2 \left(a^2 c\, x^2+c\right)^2 \arctan\left(a x\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^2 \operatorname{atan}(a\,x)^{5/2}\left(c\,a^2\,x^2+c\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2\left(\int x^2\operatorname{atan}^{\frac{5}{2}}(ax)\,dx+\int 2a^2x^4\operatorname{atan}^{\frac{5}{2}}(ax)\,dx+\int a^4x^6\operatorname{atan}^{\frac{5}{2}}(ax)\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**2*atan(a*x)**(5/2),x)
```

```
[Out] c**2*(Integral(x**2*atan(a*x)**(5/2), x) + Integral(2*a**2*x**4*atan(a*x)**
(5/2), x) + Integral(a**4*x**6*atan(a*x)**(5/2), x))
```

3.845 $\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=216

$$-\frac{c\mathrm{Int}\left(\frac{a^2cx^2+c}{\sqrt{\tan^{-1}(ax)}},x\right)}{64a}-\frac{c^2\mathrm{Int}\left(\frac{1}{\sqrt{\tan^{-1}(ax)}},x\right)}{24a}-\frac{2c^2\mathrm{Int}\left(\tan^{-1}(ax)^{3/2},x\right)}{9a}+\frac{c^2\left(a^2x^2+1\right)^3\tan^{-1}(ax)^{5/2}}{6a^2}-\frac{c^2x\left(a^2x^2+1\right)^2}{12a}$$

```
[Out] -1/9*c^2*x*(a^2*x^2+1)*arctan(a*x)^(3/2)/a-1/12*c^2*x*(a^2*x^2+1)^2*arctan(
a*x)^(3/2)/a+1/6*c^2*(a^2*x^2+1)^3*arctan(a*x)^(5/2)/a^2+1/12*c^2*(a^2*x^2+
1)*arctan(a*x)^(1/2)/a^2+1/32*c^2*(a^2*x^2+1)^2*arctan(a*x)^(1/2)/a^2-2/9*c
^2*Unintegrable(arctan(a*x)^(3/2),x)/a-1/24*c^2*Unintegrable(1/arctan(a*x)^
(1/2),x)/a-1/64*c*Unintegrable((a^2*c*x^2+c)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
```

```
[Out] (c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]])/(12*a^2) + (c^2*(1 + a^2*x^2)^2*Sqrt[
ArcTan[a*x]])/(32*a^2) - (c^2*x*(1 + a^2*x^2)*ArcTan[a*x]^(3/2))/(9*a) - (c
^2*x*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2))/(12*a) + (c^2*(1 + a^2*x^2)^3*ArcTa
n[a*x]^(5/2))/(6*a^2) - (c^2*Defer[Int][1/Sqrt[ArcTan[a*x]], x])/(24*a) - (
c*Defer[Int][(c + a^2*c*x^2)/Sqrt[ArcTan[a*x]], x])/(64*a) - (2*c^2*Defer[I
nt][ArcTan[a*x]^(3/2), x])/(9*a)
```

Rubi steps

$$\begin{aligned}\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}\,dx&=\frac{c^2\left(1+a^2x^2\right)^3\tan^{-1}(ax)^{5/2}}{6a^2}-\frac{5\int\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}\,dx}{12a}\\&=\frac{c^2\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{32a^2}-\frac{c^2x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}{12a}+\frac{c^2\left(1+a^2x^2\right)^3\tan}{6a^2}\\&=\frac{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{12a^2}+\frac{c^2\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{32a^2}-\frac{c^2x\left(1+a^2x^2\right)\tan^{-}}{9a}\end{aligned}$$

Mathematica [A] time = 1.57, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.35, size = 0, normalized size = 0.00

$$\int x \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2,x)
```

```
[Out] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int 2 a^{2} x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int a^{4} x^{5} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2*atan(a*x)**(5/2),x)
```

```
[Out] c**2*(Integral(x*atan(a*x)**(5/2), x) + Integral(2*a**2*x**3*atan(a*x)**(5/
2), x) + Integral(a**4*x**5*atan(a*x)**(5/2), x))
```

3.846 $\int \left(c+a^2 c x^2\right)^2 \tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=172

$$\frac{3}{16}c\text{Int}\left(\left(a^2cx^2+c\right)\sqrt{\tan^{-1}(ax)},x\right)+\frac{1}{2}c^2\text{Int}\left(\sqrt{\tan^{-1}(ax)},x\right)+\frac{8}{15}c^2\text{Int}\left(\tan^{-1}(ax)^{5/2},x\right)+\frac{1}{5}c^2x\left(a^2x^2+1\right)^2\tan^{-1}$$

```
[Out] -1/3*c^2*(a^2*x^2+1)*arctan(a*x)^(3/2)/a-1/8*c^2*(a^2*x^2+1)^2*arctan(a*x)^
(3/2)/a+4/15*c^2*x*(a^2*x^2+1)*arctan(a*x)^(5/2)+1/5*c^2*x*(a^2*x^2+1)^2*ar
ctan(a*x)^(5/2)+8/15*c^2*Unintegrable(arctan(a*x)^(5/2),x)+1/2*c^2*Unintegr
able(arctan(a*x)^(1/2),x)+3/16*c*Unintegrable((a^2*c*x^2+c)*arctan(a*x)^(1/
2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
```

```
[Out] -(c^2*(1 + a^2*x^2)*ArcTan[a*x]^(3/2))/(3*a) - (c^2*(1 + a^2*x^2)^2*ArcTan[
a*x]^(3/2))/(8*a) + (4*c^2*x*(1 + a^2*x^2)*ArcTan[a*x]^(5/2))/15 + (c^2*x*(
1 + a^2*x^2)^2*ArcTan[a*x]^(5/2))/5 + (c^2*Defer[Int][Sqrt[ArcTan[a*x]], x]
)/2 + (3*c*Defer[Int][(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]], x])/16 + (8*c^2*De
fer[Int][ArcTan[a*x]^(5/2), x])/15
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}\,dx &= -\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}{8a}+\frac{1}{5}c^2x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{5/2}+\frac{1}{16}(3c)\int \left(c+a\right.\\ &= -\frac{c^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}{3a}-\frac{c^2\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}{8a}+\frac{4}{15}c^2x\left(1+a^2x^2\right)\text{ta}\end{aligned}$$

Mathematica [A] time = 2.42, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.99, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int {\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2,x)
[Out] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int 2 a^{2} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int a^{4} x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(5/2),x)
[Out] c**2*(Integral(2*a**2*x**2*atan(a*x)**(5/2), x) + Integral(a**4*x**4*atan(a
*x)**(5/2), x) + Integral(atan(a*x)**(5/2), x))
```

3.847 $\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}}{x} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2 \tan^{-1}(ax)^{5/2}}{x},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x,x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}}{x} \, dx$$

Verification is Not applicable to the result.

[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x,x]

[Out] Defer[Int][((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x, x]

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}}{x} \, dx = \int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}}{x} \, dx$$

Mathematica [A] time = 1.98, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}}{x} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x,x]

[Out] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x, x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x,x, algorithm="giac")

[Out] Timed out

maple [A] time = 2.84, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{2} \arctan \left(a x\right)^{\frac{5}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x,x)
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^2)/x,x)
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^2)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}{x}\, dx + \int 2 a^{2} x \operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}\, dx + \int a^{4} x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(5/2)/x,x)
[Out] c**2*(Integral(atan(a*x)**(5/2)/x, x) + Integral(2*a**2*x*atan(a*x)**(5/2),
 x) + Integral(a**4*x**3*atan(a*x)**(5/2), x))
```

3.848 $\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}}{x^2} dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{(a^2cx^2+c)^2 \tan^{-1}(ax)^{5/2}}{x^2}, x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x^2,x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}}{x^2} dx$$

Verification is Not applicable to the result.

[In] Int[((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x^2,x]

[Out] Defer[Int][((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x^2, x]

Rubi steps

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}}{x^2} dx = \int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}}{x^2} dx$$

Mathematica [A] time = 2.78, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}}{x^2} dx$$

Verification is Not applicable to the result.

[In] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x^2,x]

[Out] Integrate[((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2))/x^2, x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x^2,x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x^2,x, algorithm="giac")

[Out] Timed out

maple [A] time = 2.50, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{5}{2}}}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x^2,x)
```

```
[Out] int((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2*arctan(a*x)^(5/2)/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^2)/x^2,x)
```

```
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^2)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int 2 a^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{x^{2}}\, dx + \int a^{4} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2*atan(a*x)**(5/2)/x**2,x)
```

```
[Out] c**2*(Integral(2*a**2*atan(a*x)**(5/2), x) + Integral(atan(a*x)**(5/2)/x**2
, x) + Integral(a**4*x**2*atan(a*x)**(5/2), x))
```

3.849 $\int x^m \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^3 \tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{5/2} \, dx=\int x^m \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{5/2} \, dx$$

Mathematica [A] time = 0.94, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x^m*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^6 c^3 x^6+3\,a^4 c^3 x^4+3\,a^2 c^3 x^2+c^3\right) x^m \arctan\left(ax\right)^{\frac{5}{2}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m*arctan(a*x
)^(5/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.76, size = 0, normalized size = 0.00

$$\int x^m \left(a^2 c\,x^2+c\right)^3 \arctan\left(ax\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.04

$$\int x^m \operatorname{atan}(a x)^{5/2} \left(c a^2 x^2 + c\right)^3 dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.850 $\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(a x)^{5/2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^3 \tan^{-1}(a x)^{5/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(a x)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(a x)^{5/2} \, dx=\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(a x)^{5/2} \, dx$$

Mathematica [A] time = 2.64, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^3 \tan^{-1}(a x)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 4.80, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**3*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.851 $\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=309

$$-\frac{9c^2\mathrm{Int}\left(\frac{a^2cx^2+c}{\sqrt{\tan^{-1}(ax)}},x\right)}{896a}-\frac{5c\mathrm{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{\sqrt{\tan^{-1}(ax)}},x\right)}{896a}-\frac{3c^3\mathrm{Int}\left(\frac{1}{\sqrt{\tan^{-1}(ax)}},x\right)}{112a}-\frac{c^3\mathrm{Int}\left(\tan^{-1}(ax)^{3/2},x\right)}{7a}+\frac{c^3\left(a^2x^2+1\right)^4\tan^{-}}{8a^2}$$

```
[Out] -1/14*c^3*x*(a^2*x^2+1)*arctan(a*x)^(3/2)/a-3/56*c^3*x*(a^2*x^2+1)^2*arctan
(a*x)^(3/2)/a-5/112*c^3*x*(a^2*x^2+1)^3*arctan(a*x)^(3/2)/a+1/8*c^3*(a^2*x^
2+1)^4*arctan(a*x)^(5/2)/a^2+3/56*c^3*(a^2*x^2+1)*arctan(a*x)^(1/2)/a^2+9/4
48*c^3*(a^2*x^2+1)^2*arctan(a*x)^(1/2)/a^2+5/448*c^3*(a^2*x^2+1)^3*arctan(a
*x)^(1/2)/a^2-1/7*c^3*Unintegrable(arctan(a*x)^(3/2),x)/a-3/112*c^3*Uninteg
rable(1/arctan(a*x)^(1/2),x)/a-9/896*c^2*Unintegrable((a^2*c*x^2+c)/arctan(
a*x)^(1/2),x)/a-5/896*c*Unintegrable((a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] (3*c^3*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]])/(56*a^2) + (9*c^3*(1 + a^2*x^2)^2*S
qrt[ArcTan[a*x]])/(448*a^2) + (5*c^3*(1 + a^2*x^2)^3*Sqrt[ArcTan[a*x]])/(44
8*a^2) - (c^3*x*(1 + a^2*x^2)*ArcTan[a*x]^(3/2))/(14*a) - (3*c^3*x*(1 + a^2
*x^2)^2*ArcTan[a*x]^(3/2))/(56*a) - (5*c^3*x*(1 + a^2*x^2)^3*ArcTan[a*x]^(3
/2))/(112*a) + (c^3*(1 + a^2*x^2)^4*ArcTan[a*x]^(5/2))/(8*a^2) - (3*c^3*Def
er[Int][1/Sqrt[ArcTan[a*x]], x])/(112*a) - (9*c^2*Defer[Int][(c + a^2*c*x^2
)/Sqrt[ArcTan[a*x]], x])/(896*a) - (5*c*Defer[Int][(c + a^2*c*x^2)^2/Sqrt[A
rcTan[a*x]], x])/(896*a) - (c^3*Defer[Int][ArcTan[a*x]^(3/2), x])/(7*a)
```

Rubi steps

$$\begin{aligned}\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}\,dx&=\frac{c^3\left(1+a^2x^2\right)^4\tan^{-1}(ax)^{5/2}}{8a^2}-\frac{5\int\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}\,dx}{16a}\\&=\frac{5c^3\left(1+a^2x^2\right)^3\sqrt{\tan^{-1}(ax)}}{448a^2}-\frac{5c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)^{3/2}}{112a}+\frac{c^3\left(1+a^2x^2\right)^4}{8a^2}\\&=\frac{9c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{448a^2}+\frac{5c^3\left(1+a^2x^2\right)^3\sqrt{\tan^{-1}(ax)}}{448a^2}-\frac{3c^3x\left(1+a^2x^2\right)^2}{56a}\\&=\frac{3c^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{56a^2}+\frac{9c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}{448a^2}+\frac{5c^3\left(1+a^2x^2\right)^3\sqrt{}}{448a^2}\end{aligned}$$

Mathematica [A] time = 1.65, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.95, size = 0, normalized size = 0.00

$$\int x \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.852 $\int \left(c+a^2 c x^2\right)^3 \tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=259

$$\frac{9}{56}c^2\text{Int}\left(\left(a^2cx^2+c\right)\sqrt{\tan^{-1}(ax)},x\right)+\frac{5}{56}c\text{Int}\left(\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)},x\right)+\frac{3}{7}c^3\text{Int}\left(\sqrt{\tan^{-1}(ax)},x\right)+\frac{16}{35}c^3\text{Int}\left(\right.$$

```
[Out] -2/7*c^3*(a^2*x^2+1)*arctan(a*x)^(3/2)/a-3/28*c^3*(a^2*x^2+1)^2*arctan(a*x)
^(3/2)/a-5/84*c^3*(a^2*x^2+1)^3*arctan(a*x)^(3/2)/a+8/35*c^3*x*(a^2*x^2+1)*
arctan(a*x)^(5/2)+6/35*c^3*x*(a^2*x^2+1)^2*arctan(a*x)^(5/2)+1/7*c^3*x*(a^2
*x^2+1)^3*arctan(a*x)^(5/2)+16/35*c^3*Unintegrable(arctan(a*x)^(5/2),x)+3/7
*c^3*Unintegrable(arctan(a*x)^(1/2),x)+9/56*c^2*Unintegrable((a^2*c*x^2+c)*
arctan(a*x)^(1/2),x)+5/56*c*Unintegrable((a^2*c*x^2+c)^2*arctan(a*x)^(1/2),
x)
```

Rubi [A] time = 0.13, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] (-2*c^3*(1 + a^2*x^2)*ArcTan[a*x]^(3/2))/(7*a) - (3*c^3*(1 + a^2*x^2)^2*Arc
Tan[a*x]^(3/2))/(28*a) - (5*c^3*(1 + a^2*x^2)^3*ArcTan[a*x]^(3/2))/(84*a) +
 (8*c^3*x*(1 + a^2*x^2)*ArcTan[a*x]^(5/2))/35 + (6*c^3*x*(1 + a^2*x^2)^2*Ar
cTan[a*x]^(5/2))/35 + (c^3*x*(1 + a^2*x^2)^3*ArcTan[a*x]^(5/2))/7 + (3*c^3*
Defer[Int][Sqrt[ArcTan[a*x]], x])/7 + (9*c^2*Defer[Int][(c + a^2*c*x^2)*Sqr
t[ArcTan[a*x]], x])/56 + (5*c*Defer[Int][(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]
], x])/56 + (16*c^3*Defer[Int][ArcTan[a*x]^(5/2), x])/35
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}\,dx &= -\frac{5c^3\left(1+a^2x^2\right)^3\tan^{-1}(ax)^{3/2}}{84a}+\frac{1}{7}c^3x\left(1+a^2x^2\right)^3\tan^{-1}(ax)^{5/2}+\frac{1}{56}(5c)\int \left(c+\right.\\ &= -\frac{3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}{28a}-\frac{5c^3\left(1+a^2x^2\right)^3\tan^{-1}(ax)^{3/2}}{84a}+\frac{6}{35}c^3x\left(1+a^2x^2\right.\\ &= -\frac{2c^3\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}{7a}-\frac{3c^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}{28a}-\frac{5c^3\left(1+a^2x^2\right)^3\tan^{-1}}{84a}\end{aligned}$$

Mathematica [A] time = 2.41, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.55, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int 3 a^{2} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int 3 a^{4} x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int a^{6} x^{6} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(5/2),x)
```

```
[Out] c**3*(Integral(3*a**2*x**2*atan(a*x)**(5/2), x) + Integral(3*a**4*x**4*atan
(a*x)**(5/2), x) + Integral(a**6*x**6*atan(a*x)**(5/2), x) + Integral(atan(
a*x)**(5/2), x))
```

3.853 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{(a^2cx^2+c)^3 \tan^{-1}(ax)^{5/2}}{x}, x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x} dx = \int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x} dx$$

Mathematica [A] time = 1.66, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x,x]
[Out] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.46, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{5}{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^3)/x,x)
```

```
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^3)/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{x}\, dx + \int 3 a^{2} x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int 3 a^{4} x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int a^{6} x^{5} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(5/2)/x,x)
```

```
[Out] c**3*(Integral(atan(a*x)**(5/2)/x, x) + Integral(3*a**2*x*atan(a*x)**(5/2),
 x) + Integral(3*a**4*x**3*atan(a*x)**(5/2), x) + Integral(a**6*x**5*atan(a
*x)**(5/2), x))
```

3.854 $\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{(a^2cx^2+c)^3 \tan^{-1}(ax)^{5/2}}{x^2}, x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x^2,x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x^2,x]
[Out] Defer[Int][((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x^2, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x^2} dx = \int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x^2} dx$$

Mathematica [A] time = 2.82, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}}{x^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x^2,x]
[Out] Integrate[((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2))/x^2, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.99, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{5}{2}}}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x^2,x)
[Out] int((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3*arctan(a*x)^(5/2)/x^2,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^3)/x^2,x)
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^3)/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int 3 a^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{x^{2}}\, dx + \int 3 a^{4} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx + \int a^{6} x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3*atan(a*x)**(5/2)/x**2,x)
[Out] c**3*(Integral(3*a**2*atan(a*x)**(5/2), x) + Integral(atan(a*x)**(5/2)/x**2
, x) + Integral(3*a**4*x**2*atan(a*x)**(5/2), x) + Integral(a**6*x**4*atan(
a*x)**(5/2), x))
```

3.855 $\int \frac{x^m \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{5/2}}{a^2cx^2+c}, x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx = \int \frac{x^m \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$$

Mathematica [A] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
[Out] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2), x]
```

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^{\frac{5}{2}}}{a^2cx^2+c}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.29, size = 0, normalized size = 0.00

$$\int \frac{x^m \arctan(ax)^{\frac{5}{2}}}{a^2c\,x^2+c} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \operatorname{atan}(a x)^{5/2}}{c a^2 x^2 + c} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(5/2)/(a**2*c*x**2+c),x)
```

```
[Out] Timed out
```

3.856 $\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$

Optimal. Leaf size=61

$$\frac{2\text{Int}\left(\tan^{-1}(ax)^{7/2},x\right)}{7a^3c}+\frac{\text{Int}\left(x\tan^{-1}(ax)^{5/2},x\right)}{a^2c}-\frac{2x\tan^{-1}(ax)^{7/2}}{7a^3c}$$

```
[Out] -2/7*x*arctan(a*x)^(7/2)/a^3/c+Unintegrable(x*arctan(a*x)^(5/2),x)/a^2/c+2/
7*Unintegrable(arctan(a*x)^(7/2),x)/a^3/c
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
```

```
[Out] (-2*x*ArcTan[a*x]^(7/2))/(7*a^3*c) + Defer[Int][x*ArcTan[a*x]^(5/2), x]/(a^
2*c) + (2*Defer[Int][ArcTan[a*x]^(7/2), x])/(7*a^3*c)
```

Rubi steps

$$\begin{aligned}\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx &= -\frac{\int \frac{x\tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx}{a^2}+\frac{\int x\tan^{-1}(ax)^{5/2} dx}{a^2c}\\ &= -\frac{2x\tan^{-1}(ax)^{7/2}}{7a^3c}+\frac{2\int \tan^{-1}(ax)^{7/2} dx}{7a^3c}+\frac{\int x\tan^{-1}(ax)^{5/2} dx}{a^2c}\end{aligned}$$

Mathematica [A] time = 4.56, size = 0, normalized size = 0.00

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A]   time = 3.21, size = 0, normalized size = 0.00

$$\int \frac{x^3 \arctan (ax)^{\frac{5}{2}}}{a^2 c x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^3 \operatorname{atan}(a\, x)^{5/2}}{c\, a^2\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \operatorname{atan}^{\frac{5}{2}}(ax)}{a^2x^2+1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(5/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x**3*atan(a*x)**(5/2)/(a**2*x**2 + 1), x)/c
```

3.857 $\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$

Optimal. Leaf size=37

$$\frac{\text{Int}\left(\tan^{-1}(ax)^{5/2},x\right)}{a^2c}-\frac{2\tan^{-1}(ax)^{7/2}}{7a^3c}$$

```
[Out] -2/7*arctan(a*x)^(7/2)/a^3/c+Unintegrable(arctan(a*x)^(5/2),x)/a^2/c
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
[Out] (-2*ArcTan[a*x]^(7/2))/(7*a^3*c) + Defer[Int][ArcTan[a*x]^(5/2), x]/(a^2*c)
```

Rubi steps

$$\begin{aligned}\int \frac{x^2\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx &= -\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx}{a^2}+\frac{\int \tan^{-1}(ax)^{5/2}\,dx}{a^2c}\\ &= -\frac{2\tan^{-1}(ax)^{7/2}}{7a^3c}+\frac{\int \tan^{-1}(ax)^{5/2}\,dx}{a^2c}\end{aligned}$$

Mathematica [A] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{x^2\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
[Out] Integrate[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \arctan\left(a x\right)^{\frac{5}{2}}}{a^{2} c \,x^{2}+c}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
[Out] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{c\,a^2\,x^2+c} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2),x)
[Out] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{a^{2} x^{2} + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(5/2)/(a**2*c*x**2+c),x)
[Out] Integral(x**2*atan(a*x)**(5/2)/(a**2*x**2 + 1), x)/c
```

3.858 $\int \frac{x\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx$

Optimal. Leaf size=41

$$\frac{2x\tan^{-1}(ax)^{7/2}}{7ac}-\frac{2\text{Int}\left(\tan^{-1}(ax)^{7/2},x\right)}{7ac}$$

```
[Out] 2/7*x*arctan(a*x)^(7/2)/a/c-2/7*Unintegrable(arctan(a*x)^(7/2),x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
```

```
[Out] (2*x*ArcTan[a*x]^(7/2))/(7*a*c) - (2*Defer[Int][ArcTan[a*x]^(7/2), x])/(7*a
*c)
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx=\frac{2x\tan^{-1}(ax)^{7/2}}{7ac}-\frac{2\int \tan^{-1}(ax)^{7/2}\,dx}{7ac}$$

Mathematica [A] time = 1.22, size = 0, normalized size = 0.00

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.40, size = 0, normalized size = 0.00

$$\int \frac{x \arctan (ax)^{\frac{5}{2}}}{a^2 c x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

```
[Out] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x \operatorname{atan}(a\,x)^{5/2}}{c\,a^2\,x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2),x)
```

```
[Out] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^{\frac{5}{2}}(ax)}{a^2x^2+1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(5/2)/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x*atan(a*x)**(5/2)/(a**2*x**2 + 1), x)/c
```

3.859 $\int \frac{\tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx$

Optimal. Leaf size=18

$$\frac{2\tan^{-1}(ax)^{7/2}}{7ac}$$

```
[Out] 2/7*arctan(a*x)^(7/2)/a/c
```

Rubi [A] time = 0.03, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4884}

$$\frac{2\tan^{-1}(ax)^{7/2}}{7ac}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2),x]
```

```
[Out] (2*ArcTan[a*x]^(7/2))/(7*a*c)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{c+a^2cx^2} dx = \frac{2\tan^{-1}(ax)^{7/2}}{7ac}$$

Mathematica [A] time = 0.00, size = 18, normalized size = 1.00

$$\frac{2\tan^{-1}(ax)^{7/2}}{7ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2),x]
```

```
[Out] (2*ArcTan[a*x]^(7/2))/(7*a*c)
```

fricas [A] time = 0.47, size = 14, normalized size = 0.78

$$\frac{2\arctan\left(ax\right)^{\frac{7}{2}}}{7\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] 2/7*arctan(a*x)^(7/2)/(a*c)
```

giac [A] time = 0.13, size = 14, normalized size = 0.78

$$\frac{2\arctan\left(ax\right)^{\frac{7}{2}}}{7\,ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] 2/7*arctan(a*x)^(7/2)/(a*c)
```

maple [A] time = 0.13, size = 15, normalized size = 0.83

$$\frac{2 \arctan \left(a x\right)^{\frac{7}{2}}}{7 a c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c),x)
```

```
[Out] 2/7*arctan(a*x)^(7/2)/a/c
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 0.40, size = 14, normalized size = 0.78

$$\frac{2 \operatorname{atan}\left(a\,x\right)^{7/2}}{7\,a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(c + a^2*c*x^2),x)
```

```
[Out] (2*atan(a*x)^(7/2))/(7*a*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{2 \operatorname{atan}^{\frac{7}{2}}{\left(a x \right)}}{7 a c} & \text{for}\: c \neq 0 \\ \tilde{\infty} \int \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/(a**2*c*x**2+c),x)
```

```
[Out] Piecewise((2*atan(a*x)**(7/2)/(7*a*c), Ne(c, 0)), (zoo*Integral(atan(a*x)**
(5/2), x), True))
```

3.860 $\int \frac{\tan^{-1}(ax)^{5/2}}{x(c+a^2cx^2)}\,dx$

Optimal. Leaf size=49

$$\frac{i\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x(ax+i)},x\right)}{c}-\frac{2i\tan^{-1}(ax)^{7/2}}{7c}$$

```
[Out] -2/7*I*arctan(a*x)^(7/2)/c+I*Unintegrable(arctan(a*x)^(5/2)/x/(I+a*x),x)/c
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)),x]
```

```
[Out] (((-2*I)/7)*ArcTan[a*x]^(7/2))/c + (I*Defer[Int][ArcTan[a*x]^(5/2)/(x*(I + a*x)), x])/c
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)}\,dx=-\frac{2i\tan^{-1}(ax)^{7/2}}{7c}+\frac{i\int \frac{\tan^{-1}(ax)^{5/2}}{x(i+ax)}\,dx}{c}$$

Mathematica [A] time = 0.66, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.47, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{5}{2}}}{x\left(a^{2}c\,x^{2}+c\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{x\,\left(c\,a^2\,x^2+c\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}{a^{2}x^{3}+x}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(a**2*x**3 + x), x)/c
```

3.861 $\int \frac{\tan^{-1}(ax)^{5/2}}{x^2(c+a^2cx^2)}\,dx$

Optimal. Leaf size=36

$$\frac{\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x^2},x\right)}{c}-\frac{2a\tan^{-1}(ax)^{7/2}}{7c}$$

```
[Out] -2/7*a*arctan(a*x)^(7/2)/c+Unintegrable(arctan(a*x)^(5/2)/x^2,x)/c
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x^2*(c + a^2*c*x^2)),x]
[Out] (-2*a*ArcTan[a*x]^(7/2))/(7*c) + Defer[Int][ArcTan[a*x]^(5/2)/x^2, x]/c
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{x^2}\,dx}{c}\\ &= -\frac{2a\tan^{-1}(ax)^{7/2}}{7c}+\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{x^2}\,dx}{c}\end{aligned}$$

Mathematica [A] time = 1.39, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x^2*(c + a^2*c*x^2)),x]
[Out] Integrate[ArcTan[a*x]^(5/2)/(x^2*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.18, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{5}{2}}}{x^2 (a^2 c x^2 + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}(a\,x)^{5/2}}{x^2 \left(c\,a^2\,x^2 + c\right)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x^2*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x^2*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\mathrm{atan}^{\frac{5}{2}}(ax)}{a^2x^4+x^2} dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x**2/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(a**2*x**4 + x**2), x)/c
```

3.862 $\int \frac{\tan^{-1}(ax)^{5/2}}{x^3(c+a^2cx^2)}\,dx$

Optimal. Leaf size=74

$$-\frac{ia^2\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x(ax+i)},x\right)}{c}+\frac{\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x^3},x\right)}{c}+\frac{2ia^2\tan^{-1}(ax)^{7/2}}{7c}$$

```
[Out] 2/7*I*a^2*arctan(a*x)^(7/2)/c+Unintegrable(arctan(a*x)^(5/2)/x^3,x)/c-I*a^2
*Unintegrable(arctan(a*x)^(5/2)/x/(I+a*x),x)/c
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^3\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] (((2*I)/7)*a^2*ArcTan[a*x]^(7/2))/c + Defer[Int][ArcTan[a*x]^(5/2)/x^3, x]/
c - (I*a^2*Defer[Int][ArcTan[a*x]^(5/2)/(x*(I + a*x)), x])/c
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{5/2}}{x^3\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{x^3}\,dx}{c}\\ &= \frac{2ia^2\tan^{-1}(ax)^{7/2}}{7c}+\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{x^3}\,dx}{c}-\frac{\left(ia^2\right)\int \frac{\tan^{-1}(ax)^{5/2}}{x(i+ax)}\,dx}{c}\end{aligned}$$

Mathematica [A] time = 2.17, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^3\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x^3*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/(x^3*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 5.17, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{\frac{5}{2}}}{x^{3}\left(a^{2} c\, x^{2}+c\right)}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}}{x^3\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x^3*(c + a^2*c*x^2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x^3*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{a^{2} x^{5} + x^{3}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x**3/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(a**2*x**5 + x**3), x)/c
```

3.863 $\int \frac{\tan^{-1}(ax)^{5/2}}{x^4(c+a^2cx^2)}\,dx$

Optimal. Leaf size=61

$$-\frac{a^2\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x^2},x\right)}{c}+\frac{\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x^4},x\right)}{c}+\frac{2a^3\tan^{-1}(ax)^{7/2}}{7c}$$

```
[Out] 2/7*a^3*arctan(a*x)^(7/2)/c+Unintegrable(arctan(a*x)^(5/2)/x^4,x)/c-a^2*Uni
ntegrable(arctan(a*x)^(5/2)/x^2,x)/c
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^4\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] (2*a^3*ArcTan[a*x]^(7/2))/(7*c) + Defer[Int][ArcTan[a*x]^(5/2)/x^4, x]/c -
(a^2*Defer[Int][ArcTan[a*x]^(5/2)/x^2, x])/c
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{5/2}}{x^4\left(c+a^2cx^2\right)}\,dx &= -\left(a^2\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\left(c+a^2cx^2\right)}\,dx\right)+\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{x^4}\,dx}{c}\\ &= a^4\int \frac{\tan^{-1}(ax)^{5/2}}{c+a^2cx^2}\,dx+\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{x^4}\,dx}{c}-\frac{a^2\int \frac{\tan^{-1}(ax)^{5/2}}{x^2}\,dx}{c}\\ &= \frac{2a^3\tan^{-1}(ax)^{7/2}}{7c}+\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{x^4}\,dx}{c}-\frac{a^2\int \frac{\tan^{-1}(ax)^{5/2}}{x^2}\,dx}{c}\end{aligned}$$

Mathematica [A] time = 3.80, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^4\left(c+a^2cx^2\right)}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x^4*(c + a^2*c*x^2)),x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/(x^4*(c + a^2*c*x^2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.17, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{5}{2}}}{x^4 \left(a^2 c \, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c),x)
[Out] int(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{x^4\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x^4*(c + a^2*c*x^2)),x)
[Out] int(atan(a*x)^(5/2)/(x^4*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{a^{2} x^{6} + x^{4}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x**4/(a**2*c*x**2+c),x)
[Out] Integral(atan(a*x)**(5/2)/(a**2*x**6 + x**4), x)/c
```

3.864 $\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{5/2}}{\left(a^2cx^2+c\right)^2},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2, x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} \, dx = \int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} \, dx$$

Mathematica [A] time = 1.43, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
[Out] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan\left(ax\right)^{\frac{5}{2}}}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^(5/2)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.62, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c\right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(5/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Timed out
```

3.865 $\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(a^2cx^2+c\right)^2},x\right)$$

```
[Out] Unintegrable(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] Defer[Int][(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2, x]
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} dx = \int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} dx$$

Mathematica [A] time = 4.50, size = 0, normalized size = 0.00

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] Integrate[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.13, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{a^{4} x^{4} + 2 a^{2} x^{2} + 1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(5/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**3*atan(a*x)**(5/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.866 $\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=157

$$-\frac{15\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a^3c^2}+\frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}+\frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2}-\frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(a^2x^2+1\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(a^2x^2+1\right)}$$

```
[Out] 5/16*arctan(a*x)^(3/2)/a^3/c^2-5/8*arctan(a*x)^(3/2)/a^3/c^2/(a^2*x^2+1)-1/
2*x*arctan(a*x)^(5/2)/a^2/c^2/(a^2*x^2+1)+1/7*arctan(a*x)^(7/2)/a^3/c^2-15/
128*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^3/c^2+15/32*x*arctan(
a*x)^(1/2)/a^2/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.22, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4936, 4930, 4892, 4970, 4406, 12, 3305, 3351}

$$-\frac{15\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a^3c^2}-\frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(a^2x^2+1\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(a^2x^2+1\right)}+\frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}+\frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] (15*x*Sqrt[ArcTan[a*x]])/(32*a^2*c^2*(1 + a^2*x^2)) + (5*ArcTan[a*x]^(3/2))
/(16*a^3*c^2) - (5*ArcTan[a*x]^(3/2))/(8*a^3*c^2*(1 + a^2*x^2)) - (x*ArcTan
[a*x]^(5/2))/(2*a^2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^(7/2)/(7*a^3*c^2) - (1
5*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(128*a^3*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
```

```
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2} + \frac{5\int \frac{x\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}dx}{4a}$$

$$= -\frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2} + \frac{15\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}dx}{16a^2}$$

$$= \frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)} + \frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2} - \frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}$$

$$= \frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)} + \frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2} - \frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}$$

$$= \frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)} + \frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2} - \frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}$$

$$= \frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)} + \frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2} - \frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}$$

$$= \frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)} + \frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2} - \frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}$$

$$= \frac{15x\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)} + \frac{5\tan^{-1}(ax)^{3/2}}{16a^3c^2} - \frac{5\tan^{-1}(ax)^{3/2}}{8a^3c^2\left(1+a^2x^2\right)} - \frac{x\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)} + \frac{\tan^{-1}(ax)^{7/2}}{7a^3c^2}$$

Mathematica [A] time = 0.21, size = 111, normalized size = 0.71

$$\frac{4\sqrt{\tan^{-1}(ax)}\left(32\left(a^2x^2+1\right)\tan^{-1}(ax)^3+70\left(a^2x^2-1\right)\tan^{-1}(ax)+105ax-112ax\tan^{-1}(ax)^2\right)-105\sqrt{\pi}\left(a^2x^2+\right.}{896a^3c^2\left(a^2x^2+1\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] (4*Sqrt[ArcTan[a*x]]*(105*a*x + 70*(-1 + a^2*x^2)*ArcTan[a*x] - 112*a*x*Arc
Tan[a*x]^2 + 32*(1 + a^2*x^2)*ArcTan[a*x]^3) - 105*Sqrt[Pi]*(1 + a^2*x^2)*F
resnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(896*a^3*c^2*(1 + a^2*x^2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.49, size = 102, normalized size = 0.65

$$\frac{\arctan(ax)^{\frac{7}{2}}}{7a^3c^2} - \frac{\arctan(ax)^{\frac{5}{2}}\sin(2\arctan(ax))}{4a^3c^2} - \frac{5\arctan(ax)^{\frac{3}{2}}\cos(2\arctan(ax))}{16a^3c^2} + \frac{15\sqrt{\arctan(ax)}\ \sin(2\arc}{64a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/7*arctan(a*x)^(7/2)/a^3/c^2-1/4/a^3/c^2*arctan(a*x)^(5/2)*sin(2*arctan(a*
x))-5/16/a^3/c^2*arctan(a*x)^(3/2)*cos(2*arctan(a*x))+15/64/a^3/c^2*arctan(
a*x)^(1/2)*sin(2*arctan(a*x))-15/128*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))
*Pi^(1/2)/a^3/c^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2}\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}{a^{4}x^{4}+2a^{2}x^{2}+1}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(5/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x**2*atan(a*x)**(5/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.867 $\int \frac{x \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2} dx$

Optimal. Leaf size=156

$$-\frac{15\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a^2c^2}-\frac{\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(a^2x^2+1\right)}+\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{15\sqrt{\tan^{-1}(ax)}}{64a^2c^2}$$

```
[Out] 5/8*x*arctan(a*x)^(3/2)/a/c^2/(a^2*x^2+1)+1/4*arctan(a*x)^(5/2)/a^2/c^2-1/2
*arctan(a*x)^(5/2)/a^2/c^2/(a^2*x^2+1)-15/128*FresnelC(2*arctan(a*x)^(1/2)/
Pi^(1/2))*Pi^(1/2)/a^2/c^2-15/64*arctan(a*x)^(1/2)/a^2/c^2+15/32*arctan(a*x
)^(1/2)/a^2/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.20, antiderivative size = 156, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}} = 0.273$, Rules used = {4930, 4892, 4904, 3312, 3304, 3352}

$$-\frac{15\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a^2c^2}-\frac{\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(a^2x^2+1\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(a^2x^2+1\right)}+\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(a^2x^2+1\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{15\sqrt{\tan^{-1}(ax)}}{64a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-15*Sqrt[ArcTan[a*x]])/(64*a^2*c^2) + (15*Sqrt[ArcTan[a*x]])/(32*a^2*c^2*(
1 + a^2*x^2)) + (5*x*ArcTan[a*x]^(3/2))/(8*a*c^2*(1 + a^2*x^2)) + ArcTan[a*
x]^(5/2)/(4*a^2*c^2) - ArcTan[a*x]^(5/2)/(2*a^2*c^2*(1 + a^2*x^2)) - (15*Sq
rt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(128*a^2*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2}\,dx = -\frac{\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)}+\frac{5\int\frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}\,dx}{4a}$$

$$=\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)}-\frac{15}{16}\int\frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$$

$$=\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)}-\frac{15\int\frac{}{\left(c+a^2cx^2\right)}}{6}$$

$$=\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)}-\frac{15\,\text{Subst}\left(\int\right.}{}$$

$$=\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{\tan^{-1}(ax)^{5/2}}{2a^2c^2\left(1+a^2x^2\right)}-\frac{15\,\text{Subst}\left(\int\right.}{}$$

$$=-\frac{15\sqrt{\tan^{-1}(ax)}}{64a^2c^2}+\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{\tan^{-1}(ax)^{5}}{2a^2c^2\left(1+a^2\right.}$$

$$=-\frac{15\sqrt{\tan^{-1}(ax)}}{64a^2c^2}+\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{\tan^{-1}(ax)^{5}}{2a^2c^2\left(1+a^2\right.}$$

$$=-\frac{15\sqrt{\tan^{-1}(ax)}}{64a^2c^2}+\frac{15\sqrt{\tan^{-1}(ax)}}{32a^2c^2\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^2}-\frac{\tan^{-1}(ax)^{5}}{2a^2c^2\left(1+a^2\right.}$$

Mathematica [C] time = 0.18, size = 234, normalized size = 1.50

$$-60\sqrt{\pi}\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+256a^2x^2\tan^{-1}(ax)^3-240a^2x^2\tan^{-1}(ax)+15i\sqrt{2}\left(a^2x^2+1\right)$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^2,x]
```

```
[Out] (240*ArcTan[a*x] - 240*a^2*x^2*ArcTan[a*x] + 640*a*x*ArcTan[a*x]^2 - 256*Ar
cTan[a*x]^3 + 256*a^2*x^2*ArcTan[a*x]^3 - 60*Sqrt[Pi]*(1 + a^2*x^2)*Sqrt[Ar
```

```
cTan[a*x]]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + (15*I)*Sqrt[2]*(1 + a
^2*x^2)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] - (15*I)*Sqrt
[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] - (15*I)*Sqrt[2]*a^2*
x^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]])/(1024*a^2*c^2*(1 + a
^2*x^2)*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.34, size = 88, normalized size = 0.56

$$-\frac{\arctan(ax)^{\frac{5}{2}}\cos(2\arctan(ax))}{4a^2c^2}+\frac{5\arctan(ax)^{\frac{3}{2}}\sin(2\arctan(ax))}{16a^2c^2}+\frac{15\sqrt{\arctan(ax)}\,\cos(2\arctan(ax))}{64a^2c^2}-\frac{15\,\mathrm{F}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] -1/4/a^2/c^2*arctan(a*x)^(5/2)*cos(2*arctan(a*x))+5/16/a^2/c^2*arctan(a*x)^
(3/2)*sin(2*arctan(a*x))+15/64/a^2/c^2*arctan(a*x)^(1/2)*cos(2*arctan(a*x))
-15/128*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2,x)
```

```
[Out] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^{\frac{5}{2}}(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(5/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(x*atan(a*x)**(5/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.868 $\int \frac{\tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^2}\,dx$

Optimal. Leaf size=151

$$\frac{x\tan^{-1}(ax)^{5/2}}{2c^2(a^2x^2+1)}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2(a^2x^2+1)}-\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2(a^2x^2+1)}+\frac{15\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128ac^2}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}$$

```
[Out] -5/16*arctan(a*x)^(3/2)/a/c^2+5/8*arctan(a*x)^(3/2)/a/c^2/(a^2*x^2+1)+1/2*x
*arctan(a*x)^(5/2)/c^2/(a^2*x^2+1)+1/7*arctan(a*x)^(7/2)/a/c^2+15/128*Fresn
elS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^2-15/32*x*arctan(a*x)^(1/2)/
c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.18, antiderivative size = 151, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4892, 4930, 4970, 4406, 12, 3305, 3351}

$$\frac{x\tan^{-1}(ax)^{5/2}}{2c^2(a^2x^2+1)}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2(a^2x^2+1)}-\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2(a^2x^2+1)}+\frac{15\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128ac^2}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (-15*x*Sqrt[ArcTan[a*x]])/(32*c^2*(1 + a^2*x^2)) - (5*ArcTan[a*x]^(3/2))/(1
6*a*c^2) + (5*ArcTan[a*x]^(3/2))/(8*a*c^2*(1 + a^2*x^2)) + (x*ArcTan[a*x]^(
5/2))/(2*c^2*(1 + a^2*x^2)) + ArcTan[a*x]^(7/2)/(7*a*c^2) + (15*Sqrt[Pi]*Fr
esnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(128*a*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
```

```
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2}\,dx = \frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}-\frac{1}{4}(5a)\int \frac{x\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^2}\,dx$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}-\frac{15}{16}\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}\,dx$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2\left(1+a^2x^2\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}+$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2\left(1+a^2x^2\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}+$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2\left(1+a^2x^2\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}+$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2\left(1+a^2x^2\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}+$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2\left(1+a^2x^2\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}+$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{32c^2\left(1+a^2x^2\right)}-\frac{5\tan^{-1}(ax)^{3/2}}{16ac^2}+\frac{5\tan^{-1}(ax)^{3/2}}{8ac^2\left(1+a^2x^2\right)}+\frac{x\tan^{-1}(ax)^{5/2}}{2c^2\left(1+a^2x^2\right)}+\frac{\tan^{-1}(ax)^{7/2}}{7ac^2}+$$

Mathematica [A] time = 0.28, size = 85, normalized size = 0.56

$$\frac{105\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+2\sqrt{\tan^{-1}(ax)}\left(64\tan^{-1}(ax)^3+7\left(16\tan^{-1}(ax)^2-15\right)\sin\left(2\tan^{-1}(ax)\right)+140\tan^{-1}(a\right.}{896ac^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^2,x]
```

```
[Out] (105*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + 2*Sqrt[ArcTan[a*x]
]*(64*ArcTan[a*x]^3 + 140*ArcTan[a*x]*Cos[2*ArcTan[a*x]] + 7*(-15 + 16*ArcT
an[a*x]^2)*Sin[2*ArcTan[a*x]]))/(896*a*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.50, size = 102, normalized size = 0.68

$$\frac{\arctan(ax)^{\frac{7}{2}}}{7a\,c^{2}}+\frac{\arctan(ax)^{\frac{5}{2}}\sin(2\arctan(ax))}{4a\,c^{2}}+\frac{5\arctan(ax)^{\frac{3}{2}}\cos(2\arctan(ax))}{16a\,c^{2}}-\frac{15\sqrt{\arctan(ax)}\,\sin(2\arcta}{64a\,c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x)
```

```
[Out] 1/7*arctan(a*x)^(7/2)/a/c^2+1/4/a/c^2*arctan(a*x)^(5/2)*sin(2*arctan(a*x))+
5/16/a/c^2*arctan(a*x)^(3/2)*cos(2*arctan(a*x))-15/64/a/c^2*arctan(a*x)^(1/
2)*sin(2*arctan(a*x))+15/128*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2
)/a/c^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\operatorname{atan}(a\,x)^{5/2}}{\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^2,x)
```

```
[Out] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{5}{2}}(ax)}{a^4x^4+2a^2x^2+1}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(a**4*x**4 + 2*a**2*x**2 + 1), x)/c**2
```

3.869 $\int \frac{\tan^{-1}(ax)^{5/2}}{x(c+a^2cx^2)^2} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x\left(a^2cx^2+c\right)^2},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^2,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^2),x]
[Out] Defer[Int][ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^2), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^2} dx = \int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^2} dx$$

Mathematica [A] time = 2.13, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^2} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^2),x]
[Out] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^2,x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.65, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(a x\right)^{\frac{5}{2}}}{x \left(a^{2} c \,x^{2}+c \right)^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^2,x)
```

```
[Out] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{a^{4} x^{5} + 2 a^{2} x^{3} + x}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x/(a**2*c*x**2+c)**2,x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(a**4*x**5 + 2*a**2*x**3 + x), x)/c**2
```

3.870 $\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{5/2}}{\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] Defer[Int][(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3, x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx = \int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$$

Mathematica [A] time = 1.97, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^{\frac{5}{2}}}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] integral(x^m*arctan(a*x)^(5/2)/(a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2
 + c^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 3.51, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan\left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(5/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Timed out
```

3.871 $\int \frac{x^5 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^5 \tan^{-1}(ax)^{5/2}}{\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(x^5*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^5*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
[Out] Defer[Int][(x^5*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3, x]
```

Rubi steps

$$\int \frac{x^5 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx = \int \frac{x^5 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$$

Mathematica [A] time = 8.42, size = 0, normalized size = 0.00

$$\int \frac{x^5 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^5*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
[Out] Integrate[(x^5*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.46, size = 0, normalized size = 0.00

$$\int \frac{x^{5} \arctan \left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] int(x^5*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^5\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^5*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{5} \operatorname{atan}^{\frac{5}{2}}{\left (a x \right)}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*atan(a*x)**(5/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**5*atan(a*x)**(5/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.872 $\int \frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=310

$$\frac{15\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^5c^3}-\frac{15\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a^5c^3}+\frac{3\tan^{-1}(ax)^{7/2}}{28a^5c^3}+\frac{45\tan^{-1}(ax)^{3/2}}{256a^5c^3}+\frac{15\sqrt{\tan^{-1}(ax)}\,\sin\left(2\tan^{-1}\right.}{256a^5c^3}$$

```
[Out] 45/256*arctan(a*x)^(3/2)/a^5/c^3+5/32*x^4*arctan(a*x)^(3/2)/a/c^3/(a^2*x^2+
1)^2-15/32*arctan(a*x)^(3/2)/a^5/c^3/(a^2*x^2+1)-1/4*x^3*arctan(a*x)^(5/2)/
a^2/c^3/(a^2*x^2+1)^2-3/8*x*arctan(a*x)^(5/2)/a^4/c^3/(a^2*x^2+1)+3/28*arct
an(a*x)^(7/2)/a^5/c^3+15/8192*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2)
)*2^(1/2)*Pi^(1/2)/a^5/c^3-15/128*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi
^(1/2)/a^5/c^3+45/128*x*arctan(a*x)^(1/2)/a^4/c^3/(a^2*x^2+1)+15/256*sin(2*
arctan(a*x))*arctan(a*x)^(1/2)/a^5/c^3-15/2048*sin(4*arctan(a*x))*arctan(a*
x)^(1/2)/a^5/c^3
```

Rubi [A] time = 0.49, antiderivative size = 310, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 11, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.458, Rules used = {4940, 4936, 4930, 4892, 4970, 4406, 12, 3305, 3351, 3312, 3296}

$$\frac{15\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^5c^3}-\frac{15\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{128a^5c^3}+\frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(a^2x^2+1\right)^2}-\frac{x^3\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(a^2x^2+1\right)^2}-\frac{3x\tan^{-1}(ax)^{5/2}}{8a^4c^3\left(a^2x^2+1\right)}+\frac{4}{12}$$

Antiderivative was successfully verified.

```
[In] Int[(x^4*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (45*x*Sqrt[ArcTan[a*x]])/(128*a^4*c^3*(1 + a^2*x^2)) + (45*ArcTan[a*x]^(3/2
))/(256*a^5*c^3) + (5*x^4*ArcTan[a*x]^(3/2))/(32*a*c^3*(1 + a^2*x^2)^2) - (
15*ArcTan[a*x]^(3/2))/(32*a^5*c^3*(1 + a^2*x^2)) - (x^3*ArcTan[a*x]^(5/2))/
(4*a^2*c^3*(1 + a^2*x^2)^2) - (3*x*ArcTan[a*x]^(5/2))/(8*a^4*c^3*(1 + a^2*x
^2)) + (3*ArcTan[a*x]^(7/2))/(28*a^5*c^3) + (15*Sqrt[Pi/2]*FresnelS[2*Sqrt[
2/Pi]*Sqrt[ArcTan[a*x]]])/(4096*a^5*c^3) - (15*Sqrt[Pi]*FresnelS[(2*Sqrt[Ar
cTan[a*x]])/Sqrt[Pi]])/(128*a^5*c^3) + (15*Sqrt[ArcTan[a*x]]*Sin[2*ArcTan[a
*x]])/(256*a^5*c^3) - (15*Sqrt[ArcTan[a*x]]*Sin[4*ArcTan[a*x]])/(2048*a^5*c
^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
```

```
|| GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{x^3\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{15}{64}\int \frac{x^4\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx + \frac{3\int \frac{x^2\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2}\,dx}{4a^2c}$$

$$= \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{x^3\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan^{-1}(ax)^{5/2}}{8a^4c^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^{7/2}}{28a^5c^3} - \frac{15\,\mathrm{Subst}\big(\ldots}{}$$

$$= \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{15\tan^{-1}(ax)^{3/2}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(1+a^2x^2\right)^2} - \frac{3x\tan^{-1}(ax)^{5/2}}{8a^4c^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}\ldots}{28a\ldots}$$

$$= \frac{45x\sqrt{\tan^{-1}(ax)}}{128a^4c^3\left(1+a^2x^2\right)} + \frac{45\tan^{-1}(ax)^{3/2}}{256a^5c^3} + \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{15\tan^{-1}(ax)^{3/2}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan\ldots}{4a^2c^3\big(\ldots}$$

$$= \frac{45x\sqrt{\tan^{-1}(ax)}}{128a^4c^3\left(1+a^2x^2\right)} + \frac{45\tan^{-1}(ax)^{3/2}}{256a^5c^3} + \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{15\tan^{-1}(ax)^{3/2}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan\ldots}{4a^2c^3\big(\ldots}$$

$$= \frac{45x\sqrt{\tan^{-1}(ax)}}{128a^4c^3\left(1+a^2x^2\right)} + \frac{45\tan^{-1}(ax)^{3/2}}{256a^5c^3} + \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{15\tan^{-1}(ax)^{3/2}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan\ldots}{4a^2c^3\big(\ldots}$$

$$= \frac{45x\sqrt{\tan^{-1}(ax)}}{128a^4c^3\left(1+a^2x^2\right)} + \frac{45\tan^{-1}(ax)^{3/2}}{256a^5c^3} + \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{15\tan^{-1}(ax)^{3/2}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan\ldots}{4a^2c^3\big(\ldots}$$

$$= \frac{45x\sqrt{\tan^{-1}(ax)}}{128a^4c^3\left(1+a^2x^2\right)} + \frac{45\tan^{-1}(ax)^{3/2}}{256a^5c^3} + \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{15\tan^{-1}(ax)^{3/2}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan\ldots}{4a^2c^3\big(\ldots}$$

$$= \frac{45x\sqrt{\tan^{-1}(ax)}}{128a^4c^3\left(1+a^2x^2\right)} + \frac{45\tan^{-1}(ax)^{3/2}}{256a^5c^3} + \frac{5x^4\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} - \frac{15\tan^{-1}(ax)^{3/2}}{32a^5c^3\left(1+a^2x^2\right)} - \frac{x^3\tan\ldots}{4a^2c^3\big(\ldots}$$

Mathematica [C] time = 0.65, size = 287, normalized size = 0.93

$$\frac{38080a^4x^4\tan^{-1}(ax)^2 - 71680a^3x^3\tan^{-1}(ax)^3 + 57120a^3x^3\tan^{-1}(ax) - 13440a^2x^2\tan^{-1}(ax)^2 + 12288\left(a^2x^2+1\ldots\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^4*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (50400*a*x*ArcTan[a*x] + 57120*a^3*x^3*ArcTan[a*x] - 33600*ArcTan[a*x]^2 -
13440*a^2*x^2*ArcTan[a*x]^2 + 38080*a^4*x^4*ArcTan[a*x]^2 - 43008*a*x*ArcTa
n[a*x]^3 - 71680*a^3*x^3*ArcTan[a*x]^3 + 12288*(1 + a^2*x^2)^2*ArcTan[a*x]^
4 + 3360*Sqrt[2]*(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*A
rcTan[a*x]] + 3360*Sqrt[2]*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (
```

```
2*I)*ArcTan[a*x]] - 105*(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (
-4*I)*ArcTan[a*x]] - 105*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*
I)*ArcTan[a*x]])/(114688*a^5*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.69, size = 194, normalized size = 0.63

$$\frac{3\arctan(ax)^{\frac{7}{2}}}{28a^5c^3}-\frac{\arctan(ax)^{\frac{5}{2}}\sin(2\arctan(ax))}{4a^5c^3}+\frac{\arctan(ax)^{\frac{5}{2}}\sin(4\arctan(ax))}{32a^5c^3}-\frac{5\arctan(ax)^{\frac{3}{2}}\cos(2\arcta}{16a^5c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 3/28*arctan(a*x)^(7/2)/a^5/c^3-1/4/a^5/c^3*arctan(a*x)^(5/2)*sin(2*arctan(a
*x))+1/32/a^5/c^3*arctan(a*x)^(5/2)*sin(4*arctan(a*x))-5/16/a^5/c^3*arctan(
a*x)^(3/2)*cos(2*arctan(a*x))+5/256/a^5/c^3*arctan(a*x)^(3/2)*cos(4*arctan(
a*x))+15/8192*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/
2)/a^5/c^3+15/64*sin(2*arctan(a*x))*arctan(a*x)^(1/2)/a^5/c^3-15/2048*sin(4
*arctan(a*x))*arctan(a*x)^(1/2)/a^5/c^3-15/128*FresnelS(2*arctan(a*x)^(1/2)
/Pi^(1/2))*Pi^(1/2)/a^5/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^4\,\mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^4*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4 \operatorname{atan}^{\frac{5}{2}}(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**(5/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**4*atan(a*x)**(5/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.873 $\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} \, dx$

Optimal. Leaf size=256

$$\frac{15\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^4c^3}-\frac{15\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{256a^4c^3}-\frac{3\tan^{-1}(ax)^{5/2}}{32a^4c^3}-\frac{135\sqrt{\tan^{-1}(ax)}}{2048a^4c^3}+\frac{x^4\tan^{-1}(ax)^{5/2}}{4c^3\left(a^2x^2+1\right)^2}-\frac{15x^4}{256c^3}$$

```
[Out] 5/32*x^3*arctan(a*x)^(3/2)/a/c^3/(a^2*x^2+1)^2+15/64*x*arctan(a*x)^(3/2)/a^
3/c^3/(a^2*x^2+1)-3/32*arctan(a*x)^(5/2)/a^4/c^3+1/4*x^4*arctan(a*x)^(5/2)/
c^3/(a^2*x^2+1)^2+15/8192*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^
(1/2)*Pi^(1/2)/a^4/c^3-15/256*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/
2)/a^4/c^3-135/2048*arctan(a*x)^(1/2)/a^4/c^3-15/256*x^4*arctan(a*x)^(1/2)/
c^3/(a^2*x^2+1)^2+45/256*arctan(a*x)^(1/2)/a^4/c^3/(a^2*x^2+1)
```

Rubi [A] time = 0.49, antiderivative size = 256, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4944, 4940, 4936, 4930, 4904, 3312, 3304, 3352, 4970}

$$\frac{15\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^4c^3}-\frac{15\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{256a^4c^3}+\frac{x^4\tan^{-1}(ax)^{5/2}}{4c^3\left(a^2x^2+1\right)^2}-\frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(a^2x^2+1\right)^2}+\frac{5x}{32}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-135*Sqrt[ArcTan[a*x]])/(2048*a^4*c^3) - (15*x^4*Sqrt[ArcTan[a*x]])/(256*c
^3*(1 + a^2*x^2)^2) + (45*Sqrt[ArcTan[a*x]])/(256*a^4*c^3*(1 + a^2*x^2)) +
(5*x^3*ArcTan[a*x]^(3/2))/(32*a*c^3*(1 + a^2*x^2)^2) + (15*x*ArcTan[a*x]^(3
/2))/(64*a^3*c^3*(1 + a^2*x^2)) - (3*ArcTan[a*x]^(5/2))/(32*a^4*c^3) + (x^4
*ArcTan[a*x]^(5/2))/(4*c^3*(1 + a^2*x^2)^2) + (15*Sqrt[Pi/2]*FresnelC[2*Sqr
t[2/Pi]*Sqrt[ArcTan[a*x]]])/(4096*a^4*c^3) - (15*Sqrt[Pi]*FresnelC[(2*Sqrt[
ArcTan[a*x]])/Sqrt[Pi]])/(256*a^4*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
```

```
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4936

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^2)/((d_) + (e_.)*(x_)^2)
^2, x_Symbol] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(2*b*c^3*d^2*(p + 1)), x]
 + (Dist[(b*p)/(2*c), Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x]
, x] - Simp[(x*(a + b*ArcTan[c*x])^p)/(2*c^2*d*(d + e*x^2)), x]) /; FreeQ[{
a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{x^4 \tan^{-1}(ax)^{5/2}}{4c^3\left(1+a^2x^2\right)^2} - \frac{1}{8}(5a)\int \frac{x^4 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx$$

$$= -\frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{x^4\tan^{-1}(ax)^{5/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{1}{512}(15a)\int \frac{}{\left(c+a^2cx^2\right)}$$

$$= -\frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15x\tan^{-1}(ax)^{3/2}}{64a^3c^3\left(1+a^2x^2\right)} - \frac{3\tan^{-1}(ax)^{5/2}}{32a^4c^3} + \frac{x^4 \mathrm{ta}}{4c^3(}$$

$$= -\frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{45\sqrt{\tan^{-1}(ax)}}{256a^4c^3\left(1+a^2x^2\right)} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15x\tan^{-1}(ax)^{3/2}}{64a^3c^3\left(1+a^2x^2\right)} -$$

$$= \frac{45\sqrt{\tan^{-1}(ax)}}{2048a^4c^3} - \frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{45\sqrt{\tan^{-1}(ax)}}{256a^4c^3\left(1+a^2x^2\right)} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15x}{64a^3}$$

$$= \frac{45\sqrt{\tan^{-1}(ax)}}{2048a^4c^3} - \frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{45\sqrt{\tan^{-1}(ax)}}{256a^4c^3\left(1+a^2x^2\right)} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15x}{64a^3}$$

$$= -\frac{135\sqrt{\tan^{-1}(ax)}}{2048a^4c^3} - \frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{45\sqrt{\tan^{-1}(ax)}}{256a^4c^3\left(1+a^2x^2\right)} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{1}{6}$$

$$= -\frac{135\sqrt{\tan^{-1}(ax)}}{2048a^4c^3} - \frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{45\sqrt{\tan^{-1}(ax)}}{256a^4c^3\left(1+a^2x^2\right)} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{1}{6}$$

$$= -\frac{135\sqrt{\tan^{-1}(ax)}}{2048a^4c^3} - \frac{15x^4\sqrt{\tan^{-1}(ax)}}{256c^3\left(1+a^2x^2\right)^2} + \frac{45\sqrt{\tan^{-1}(ax)}}{256a^4c^3\left(1+a^2x^2\right)} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{1}{6}$$

Mathematica [C] time = 0.76, size = 359, normalized size = 1.40

$$510\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right) + \frac{20480a^4x^4\tan^{-1}(ax)^3 - 16320a^4x^4\tan^{-1}(ax) + 51200a^3x^3\tan^{-1}(ax)^2 - 4080\sqrt{\pi}\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}\,C}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (510*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + (14400*ArcTan[a*
x] + 5760*a^2*x^2*ArcTan[a*x] - 16320*a^4*x^4*ArcTan[a*x] + 30720*a*x*ArcTa
n[a*x]^2 + 51200*a^3*x^3*ArcTan[a*x]^2 - 12288*ArcTan[a*x]^3 - 24576*a^2*x^
2*ArcTan[a*x]^3 + 20480*a^4*x^4*ArcTan[a*x]^3 - 4080*Sqrt[Pi]*(1 + a^2*x^2)
^2*Sqrt[ArcTan[a*x]]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + (900*I)*Sqr
t[2]*(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]]
- (900*I)*Sqrt[2]*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcT
an[a*x]] + (135*I)*(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)
```

```
*ArcTan[a*x]] - (135*I)*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I
)*ArcTan[a*x]])/((1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]))/(131072*a^4*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.57, size = 180, normalized size = 0.70

$$-\frac{\arctan(ax)^{\frac{5}{2}}\cos(2\arctan(ax))}{8a^4c^3}+\frac{\arctan(ax)^{\frac{5}{2}}\cos(4\arctan(ax))}{32a^4c^3}+\frac{5\arctan(ax)^{\frac{3}{2}}\sin(2\arctan(ax))}{32a^4c^3}-\frac{5\arctan$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/8/a^4/c^3*arctan(a*x)^(5/2)*cos(2*arctan(a*x))+1/32/a^4/c^3*arctan(a*x)^
(5/2)*cos(4*arctan(a*x))+5/32/a^4/c^3*arctan(a*x)^(3/2)*sin(2*arctan(a*x))-
5/256/a^4/c^3*arctan(a*x)^(3/2)*sin(4*arctan(a*x))+15/8192*FresnelC(2*2^(1/
2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^4/c^3+15/128/a^4/c^3*arct
an(a*x)^(1/2)*cos(2*arctan(a*x))-15/2048/a^4/c^3*arctan(a*x)^(1/2)*cos(4*ar
ctan(a*x))-15/256*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,\mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3 \operatorname{atan}^{\frac{5}{2}}(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(5/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**3*atan(a*x)**(5/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.874 $\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3} dx$

Optimal. Leaf size=133

$$-\frac{15\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^3c^3}+\frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3}-\frac{\tan^{-1}(ax)^{5/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3}+\frac{15\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{2048a^3c^3}-5$$

```
[Out] 1/28*arctan(a*x)^(7/2)/a^3/c^3-5/256*arctan(a*x)^(3/2)*cos(4*arctan(a*x))/a
^3/c^3-1/32*arctan(a*x)^(5/2)*sin(4*arctan(a*x))/a^3/c^3-15/8192*FresnelS(2
*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^3/c^3+15/2048*sin(4
*arctan(a*x))*arctan(a*x)^(1/2)/a^3/c^3
```

Rubi [A] time = 0.18, antiderivative size = 133, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4970, 4406, 3296, 3305, 3351}

$$-\frac{15\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^3c^3}+\frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3}-\frac{\tan^{-1}(ax)^{5/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3}+\frac{15\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{2048a^3c^3}-5$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] ArcTan[a*x]^(7/2)/(28*a^3*c^3) - (5*ArcTan[a*x]^(3/2)*Cos[4*ArcTan[a*x]])/(
256*a^3*c^3) - (15*Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(40
96*a^3*c^3) + (15*Sqrt[ArcTan[a*x]]*Sin[4*ArcTan[a*x]])/(2048*a^3*c^3) - (A
rcTan[a*x]^(5/2)*Sin[4*ArcTan[a*x]])/(32*a^3*c^3)
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
```

```
|| GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{\text{Subst}\left(\int x^{5/2}\cos^2(x)\sin^2(x)\,dx, x, \tan^{-1}(ax)\right)}{a^3c^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{x^{5/2}}{8}-\frac{1}{8}x^{5/2}\cos(4x)\right)dx, x, \tan^{-1}(ax)\right)}{a^3c^3}$$

$$= \frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3} - \frac{\text{Subst}\left(\int x^{5/2}\cos(4x)\,dx, x, \tan^{-1}(ax)\right)}{8a^3c^3}$$

$$= \frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3} - \frac{\tan^{-1}(ax)^{5/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3} + \frac{5\,\text{Subst}\left(\int x^{3/2}\sin(4x)\,dx, x, \tan^{-1}(a$$

$$= \frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3} - \frac{5\tan^{-1}(ax)^{3/2}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3} - \frac{\tan^{-1}(ax)^{5/2}\sin\left(4\tan^{-1}(ax)\right)}{32a^3c^3} + 15$$

$$= \frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3} - \frac{5\tan^{-1}(ax)^{3/2}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3} + \frac{15\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{2048a^3c^3} -$$

$$= \frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3} - \frac{5\tan^{-1}(ax)^{3/2}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3} + \frac{15\sqrt{\tan^{-1}(ax)}\sin\left(4\tan^{-1}(ax)\right)}{2048a^3c^3} -$$

$$= \frac{\tan^{-1}(ax)^{7/2}}{28a^3c^3} - \frac{5\tan^{-1}(ax)^{3/2}\cos\left(4\tan^{-1}(ax)\right)}{256a^3c^3} - \frac{15\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^3c^3} + 15\sqrt{}$$

Mathematica [C] time = 0.48, size = 185, normalized size = 1.39

$$\frac{105\left(a^2x^2+1\right)^2\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}(ax)\right)+105\left(a^2x^2+1\right)^2\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},4i\tan^{-1}(ax)\right)+32\tan}{114688a^3c^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (32*ArcTan[a*x]*(-105*a*x*(-1 + a^2*x^2) - 70*(1 - 6*a^2*x^2 + a^4*x^4)*Arc
Tan[a*x] + 448*a*x*(-1 + a^2*x^2)*ArcTan[a*x]^2 + 128*(1 + a^2*x^2)^2*ArcTa
n[a*x]^3) + 105*(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*Ar
cTan[a*x]] + 105*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTa
n[a*x]])/(114688*a^3*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.58, size = 96, normalized size = 0.72

$$\frac{2048\arctan\left(ax\right)^{4}-1792\arctan\left(ax\right)^{3}\sin\left(4\arctan\left(ax\right)\right)-105\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan\left(ax\right)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-1120\,\mathrm{a}}{57344a^{3}c^{3}\sqrt{\arctan\left(ax\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 1/57344/a^3/c^3*(2048*arctan(a*x)^4-1792*arctan(a*x)^3*sin(4*arctan(a*x))-1
05*2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*
x)^(1/2))-1120*arctan(a*x)^2*cos(4*arctan(a*x))+420*sin(4*arctan(a*x))*arct
an(a*x))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(5/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x**2*atan(a*x)**(5/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1),
 x)/c**3
```

3.875 $\int \frac{x\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=254

$$-\frac{15\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^2c^3}-\frac{15\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{256a^2c^3}-\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{15x\tan^{-1}(ax)^{3/2}}{64ac^3\left(a^2x^2+1\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(a^2x^2+1\right)}$$

```
[Out] 5/32*x*arctan(a*x)^(3/2)/a/c^3/(a^2*x^2+1)^2+15/64*x*arctan(a*x)^(3/2)/a/c^
3/(a^2*x^2+1)+3/32*arctan(a*x)^(5/2)/a^2/c^3-1/4*arctan(a*x)^(5/2)/a^2/c^3/
(a^2*x^2+1)^2-15/8192*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2
)*Pi^(1/2)/a^2/c^3-15/256*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a
^2/c^3-225/2048*arctan(a*x)^(1/2)/a^2/c^3+15/256*arctan(a*x)^(1/2)/a^2/c^3/
(a^2*x^2+1)^2+45/256*arctan(a*x)^(1/2)/a^2/c^3/(a^2*x^2+1)
```

Rubi [A] time = 0.34, antiderivative size = 254, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4930, 4900, 4892, 4904, 3312, 3304, 3352}

$$-\frac{15\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4096a^2c^3}-\frac{15\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{256a^2c^3}-\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(a^2x^2+1\right)^2}+\frac{15x\tan^{-1}(ax)^{3/2}}{64ac^3\left(a^2x^2+1\right)}+$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-225*Sqrt[ArcTan[a*x]])/(2048*a^2*c^3) + (15*Sqrt[ArcTan[a*x]])/(256*a^2*c
^3*(1 + a^2*x^2)^2) + (45*Sqrt[ArcTan[a*x]])/(256*a^2*c^3*(1 + a^2*x^2)) +
(5*x*ArcTan[a*x]^(3/2))/(32*a*c^3*(1 + a^2*x^2)^2) + (15*x*ArcTan[a*x]^(3/2
))/(64*a*c^3*(1 + a^2*x^2)) + (3*ArcTan[a*x]^(5/2))/(32*a^2*c^3) - ArcTan[a
*x]^(5/2)/(4*a^2*c^3*(1 + a^2*x^2)^2) - (15*Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi
]*Sqrt[ArcTan[a*x]]])/(4096*a^2*c^3) - (15*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan
[a*x]])/Sqrt[Pi]])/(256*a^2*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
```

```
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3}\,dx = -\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(1+a^2x^2\right)^2}+\frac{5\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^3}\,dx}{8a}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}-\frac{\tan^{-1}(ax)^{5/2}}{4a^2c^3\left(1+a^2x^2\right)^2}-\frac{15\int \frac{1}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}}{512a}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}+\frac{15x\tan^{-1}(ax)^{3/2}}{64ac^3\left(1+a^2x^2\right)}+\frac{3\tan^{-1}(ax)^{5/2}}{32a^2c^3}-\frac{\tan}{4a^2c^3}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{45\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}+\frac{15x\tan^{-1}(ax)^{3/2}}{64ac^3\left(1+a^2x^2\right)}+$$

$$= -\frac{45\sqrt{\tan^{-1}(ax)}}{2048a^2c^3}+\frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{45\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}+$$

$$= -\frac{45\sqrt{\tan^{-1}(ax)}}{2048a^2c^3}+\frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{45\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}+$$

$$= -\frac{225\sqrt{\tan^{-1}(ax)}}{2048a^2c^3}+\frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{45\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}+$$

$$= -\frac{225\sqrt{\tan^{-1}(ax)}}{2048a^2c^3}+\frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{45\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}+$$

$$= -\frac{225\sqrt{\tan^{-1}(ax)}}{2048a^2c^3}+\frac{15\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)^2}+\frac{45\sqrt{\tan^{-1}(ax)}}{256a^2c^3\left(1+a^2x^2\right)}+\frac{5x\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2}+$$

Mathematica [C] time = 0.70, size = 359, normalized size = 1.41

$$450\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+\frac{12288a^4x^4\tan^{-1}(ax)^3-14400a^4x^4\tan^{-1}(ax)+30720a^3x^3\tan^{-1}(ax)^2-3600\sqrt{\pi}\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^3,x]
```

```
[Out] (450*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + (16320*ArcTan[a*
x] - 5760*a^2*x^2*ArcTan[a*x] - 14400*a^4*x^4*ArcTan[a*x] + 51200*a*x*ArcTa
n[a*x]^2 + 30720*a^3*x^3*ArcTan[a*x]^2 - 20480*ArcTan[a*x]^3 + 24576*a^2*x^
2*ArcTan[a*x]^3 + 12288*a^4*x^4*ArcTan[a*x]^3 - 3600*Sqrt[Pi]*(1 + a^2*x^2)
^2*Sqrt[ArcTan[a*x]]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + (1020*I)*Sq
rt[2]*(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]]
 - (1020*I)*Sqrt[2]*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*Ar
cTan[a*x]] + (345*I)*(1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*
```

```
I)*ArcTan[a*x]] - (345*I)*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4
*I)*ArcTan[a*x]])/((1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]))/(131072*a^2*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.53, size = 180, normalized size = 0.71

$$-\frac{\arctan(ax)^{\frac{5}{2}}\cos(2\arctan(ax))}{8a^2c^3}-\frac{\arctan(ax)^{\frac{5}{2}}\cos(4\arctan(ax))}{32a^2c^3}+\frac{5\arctan(ax)^{\frac{3}{2}}\sin(2\arctan(ax))}{32a^2c^3}+\frac{5\,\mathrm{arctar}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] -1/8/a^2/c^3*arctan(a*x)^(5/2)*cos(2*arctan(a*x))-1/32/a^2/c^3*arctan(a*x)^
(5/2)*cos(4*arctan(a*x))+5/32/a^2/c^3*arctan(a*x)^(3/2)*sin(2*arctan(a*x))+
5/256/a^2/c^3*arctan(a*x)^(3/2)*sin(4*arctan(a*x))-15/8192*FresnelC(2*2^(1/
2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^2/c^3+15/128/a^2/c^3*arct
an(a*x)^(1/2)*cos(2*arctan(a*x))+15/2048/a^2/c^3*arctan(a*x)^(1/2)*cos(4*ar
ctan(a*x))-15/256*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,\mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3,x)
```

```
[Out] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^{\frac{5}{2}}(ax)}{a^6x^6+3a^4x^4+3a^2x^2+1}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(5/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(x*atan(a*x)**(5/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)
/c**3
```

3.876 $\int \frac{\tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^3}\,dx$

Optimal. Leaf size=296

$$\frac{3x\tan^{-1}(ax)^{5/2}}{8c^3(a^2x^2+1)}+\frac{x\tan^{-1}(ax)^{5/2}}{4c^3(a^2x^2+1)^2}+\frac{15\tan^{-1}(ax)^{3/2}}{32ac^3(a^2x^2+1)}+\frac{5\tan^{-1}(ax)^{3/2}}{32ac^3(a^2x^2+1)^2}-\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3(a^2x^2+1)}+\frac{15\sqrt{\frac{\pi}{2}}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-}}\right.}{4096ac^3}$$

```
[Out] -75/256*arctan(a*x)^(3/2)/a/c^3+5/32*arctan(a*x)^(3/2)/a/c^3/(a^2*x^2+1)^2+
15/32*arctan(a*x)^(3/2)/a/c^3/(a^2*x^2+1)+1/4*x*arctan(a*x)^(5/2)/c^3/(a^2*
x^2+1)^2+3/8*x*arctan(a*x)^(5/2)/c^3/(a^2*x^2+1)+3/28*arctan(a*x)^(7/2)/a/c
^3+15/8192*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/
a/c^3+15/128*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^3-45/128*x
*arctan(a*x)^(1/2)/c^3/(a^2*x^2+1)-15/256*sin(2*arctan(a*x))*arctan(a*x)^(1
/2)/a/c^3-15/2048*sin(4*arctan(a*x))*arctan(a*x)^(1/2)/a/c^3
```

Rubi [A] time = 0.37, antiderivative size = 296, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4900, 4892, 4930, 4970, 4406, 12, 3305, 3351, 4904, 3312, 3296}

$$\frac{3x\tan^{-1}(ax)^{5/2}}{8c^3(a^2x^2+1)}+\frac{x\tan^{-1}(ax)^{5/2}}{4c^3(a^2x^2+1)^2}+\frac{15\tan^{-1}(ax)^{3/2}}{32ac^3(a^2x^2+1)}+\frac{5\tan^{-1}(ax)^{3/2}}{32ac^3(a^2x^2+1)^2}-\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3(a^2x^2+1)}+\frac{15\sqrt{\frac{\pi}{2}}S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-}}\right.}{4096ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] (-45*x*Sqrt[ArcTan[a*x]])/(128*c^3*(1 + a^2*x^2)) - (75*ArcTan[a*x]^(3/2))/
(256*a*c^3) + (5*ArcTan[a*x]^(3/2))/(32*a*c^3*(1 + a^2*x^2)^2) + (15*ArcTan
[a*x]^(3/2))/(32*a*c^3*(1 + a^2*x^2)) + (x*ArcTan[a*x]^(5/2))/(4*c^3*(1 + a
^2*x^2)^2) + (3*x*ArcTan[a*x]^(5/2))/(8*c^3*(1 + a^2*x^2)) + (3*ArcTan[a*x]
^(7/2))/(28*a*c^3) + (15*Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]
])/(4096*a*c^3) + (15*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(1
28*a*c^3) - (15*Sqrt[ArcTan[a*x]]*Sin[2*ArcTan[a*x]])/(256*a*c^3) - (15*Sqr
t[ArcTan[a*x]]*Sin[4*ArcTan[a*x]])/(2048*a*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4892

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2)^2, x_Sym
bol] :> Simp[(x*(a + b*ArcTan[c*x])^p)/(2*d*(d + e*x^2)), x] + (-Dist[(b*c*
p)/2, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(d + e*x^2)^2, x], x] + Simp[(a +
 b*ArcTan[c*x])^(p + 1)/(2*b*c*d^2*(p + 1)), x]) /; FreeQ[{a, b, c, d, e},
x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^3}\,dx = \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)^{5/2}}{4c^3\left(1+a^2x^2\right)^2} - \frac{15}{64}\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^3}\,dx + \frac{3\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^2}\,dx}{4c}$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{x\tan^{-1}(ax)^{5/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)^{5/2}}{8c^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^{7/2}}{28ac^3} - \frac{15\,\text{Subst}\left(\int \sqrt{x}\right.}{}$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax)^{5/2}}{4c^3\left(1+a^2x^2\right)^2} + \frac{3x\tan^{-1}(ax)^{5/2}}{8c^3\left(1+a^2x^2\right)} + \frac{3\tan^{-1}(ax)^{7/2}}{28ac^3}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3\left(1+a^2x^2\right)} - \frac{75\tan^{-1}(ax)^{3/2}}{256ac^3} + \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax}{4c^3\left(1+a^2\right.}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3\left(1+a^2x^2\right)} - \frac{75\tan^{-1}(ax)^{3/2}}{256ac^3} + \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax}{4c^3\left(1+a^2\right.}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3\left(1+a^2x^2\right)} - \frac{75\tan^{-1}(ax)^{3/2}}{256ac^3} + \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax}{4c^3\left(1+a^2\right.}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3\left(1+a^2x^2\right)} - \frac{75\tan^{-1}(ax)^{3/2}}{256ac^3} + \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax}{4c^3\left(1+a^2\right.}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3\left(1+a^2x^2\right)} - \frac{75\tan^{-1}(ax)^{3/2}}{256ac^3} + \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax}{4c^3\left(1+a^2\right.}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{128c^3\left(1+a^2x^2\right)} - \frac{75\tan^{-1}(ax)^{3/2}}{256ac^3} + \frac{5\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)^2} + \frac{15\tan^{-1}(ax)^{3/2}}{32ac^3\left(1+a^2x^2\right)} + \frac{x\tan^{-1}(ax}{4c^3\left(1+a^2\right.}$$

Mathematica [A] time = 0.38, size = 162, normalized size = 0.55

$$\frac{\frac{16\sqrt{\tan^{-1}(ax)}\left(-105ax\left(15a^2x^2+17\right)+384\left(a^2x^2+1\right)^2\tan^{-1}(ax)^3+448ax\left(3a^2x^2+5\right)\tan^{-1}(ax)^2-70\left(15a^4x^4+6a^2x^2-17\right)\tan^{-1}(ax)\right)}{\left(a^2x^2+1\right)^2}+105\sqrt{2\pi}\,S\left(2\right.}{57344ac^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^3,x]
```

```
[Out] ((16*Sqrt[ArcTan[a*x]]*(-105*a*x*(17 + 15*a^2*x^2) - 70*(-17 + 6*a^2*x^2 +
15*a^4*x^4)*ArcTan[a*x] + 448*a*x*(5 + 3*a^2*x^2)*ArcTan[a*x]^2 + 384*(1 +
a^2*x^2)^2*ArcTan[a*x]^3))/(1 + a^2*x^2)^2 + 105*Sqrt[2*Pi]*FresnelS[2*Sqrt
[2/Pi]*Sqrt[ArcTan[a*x]]] + 6720*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sq
rt[Pi]])/(57344*a*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.72, size = 194, normalized size = 0.66

$$\frac{3\arctan(ax)^{\frac{7}{2}}}{28a\,c^3}+\frac{\arctan(ax)^{\frac{5}{2}}\sin(2\arctan(ax))}{4a\,c^3}+\frac{\arctan(ax)^{\frac{5}{2}}\sin(4\arctan(ax))}{32a\,c^3}+\frac{5\arctan(ax)^{\frac{3}{2}}\cos(2\arctan$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x)
```

```
[Out] 3/28*arctan(a*x)^(7/2)/a/c^3+1/4/a/c^3*arctan(a*x)^(5/2)*sin(2*arctan(a*x))
+1/32/a/c^3*arctan(a*x)^(5/2)*sin(4*arctan(a*x))+5/16/a/c^3*arctan(a*x)^(3/
2)*cos(2*arctan(a*x))+5/256/a/c^3*arctan(a*x)^(3/2)*cos(4*arctan(a*x))+15/8
192*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a/c^3-1
5/64*sin(2*arctan(a*x))*arctan(a*x)^(1/2)/a/c^3-15/2048*sin(4*arctan(a*x))*
arctan(a*x)^(1/2)/a/c^3+15/128*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1
/2)/a/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^3,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^3,x)
```

```
[Out] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}{a^{6} x^{6} + 3 a^{4} x^{4} + 3 a^{2} x^{2} + 1}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/(a**2*c*x**2+c)**3,x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(a**6*x**6 + 3*a**4*x**4 + 3*a**2*x**2 + 1), x)/c
**3
```

3.877 $\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^3}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x\left(a^2cx^2+c\right)^3},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^3,x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] Defer[Int][ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^3), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^3}\,dx=\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Mathematica [A] time = 3.44, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^3),x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^3), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^3,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 4.90, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(a x\right)^{\frac{5}{2}}}{x \left(a^{2} c \,x^{2}+c \right)^{3}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^3,x)
[Out] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^3,x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^3),x)
[Out] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}{a^{6} x^{7} + 3 a^{4} x^{5} + 3 a^{2} x^{3} + x}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x/(a**2*c*x**2+c)**3,x)
[Out] Integral(atan(a*x)**(5/2)/(a**6*x**7 + 3*a**4*x**5 + 3*a**2*x**3 + x), x)/c
**3
```

3.878 $\int x^m \sqrt{c+a^2cx^2} \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^m\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}\,dx=\int x^m\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}\,dx$$

Mathematica [A] time = 0.71, size = 0, normalized size = 0.00

$$\int x^m\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^m*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{a^2cx^2+c}\,x^m\arctan(ax)^{\frac{5}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^(5/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.10, size = 0, normalized size = 0.00

$$\int x^m\arctan(ax)^{\frac{5}{2}}\sqrt{a^2c\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^m*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m \operatorname{atan}(a\,x)^{5/2}\,\sqrt{c\,a^2\,x^2+c}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(5/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.879 $\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(x^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx=\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$$

Mathematica [A] time = 3.35, size = 0, normalized size = 0.00

$$\int x^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.04, size = 0, normalized size = 0.00

$$\int x^2\arctan(ax)^{\frac{5}{2}}\sqrt{a^2c\,x^2+c}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2 \operatorname{atan}(a\,x)^{5/2}\,\sqrt{c\,a^2\,x^2+c}\;dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(5/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.880 $\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=160

$$-\frac{5c\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{16a}-\frac{5c\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)}{12a}+\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{5/2}}{3a^2c}-\frac{5x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{12a}+$$

```
[Out] 1/3*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)/a^2/c-5/12*x*arctan(a*x)^(3/2)*(a
^2*c*x^2+c)^(1/2)/a+5/8*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a^2-5/12*c*Un
integrable(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)/a-5/16*c*Unintegrable(1
/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
```

```
[Out] (5*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(8*a^2) - (5*x*Sqrt[c + a^2*c*x^2
]*ArcTan[a*x]^(3/2))/(12*a) + ((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2))/(3*
a^2*c) - (5*c*Defer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/(16
*a) - (5*c*Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2], x])/(12*a)
```

Rubi steps

$$\begin{aligned}\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx &= \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}{3a^2c}-\frac{5\int\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}\,dx}{6a}\\ &= \frac{5\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}{8a^2}-\frac{5x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{12a}+\frac{\left(c+a^2cx^2\right)^{3/2}\tan}{3a^2c}\end{aligned}$$

Mathematica [A] time = 5.09, size = 0, normalized size = 0.00

$$\int x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 2.82, size = 0, normalized size = 0.00

$$\int x \arctan(ax)^{\frac{5}{2}} \sqrt{a^2 c x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int x \operatorname{atan}(a\,x)^{5/2} \sqrt{c\,a^2\,x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(5/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.881 $\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=119

$$\frac{15}{8}c\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)+\frac{1}{2}c\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{\sqrt{a^2cx^2+c}},x\right)+\frac{1}{2}x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{5/2}-\frac{5\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{4a}$$

```
[Out] -5/4*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a+1/2*x*arctan(a*x)^(5/2)*(a^2*c
*x^2+c)^(1/2)+1/2*c*Unintegrable(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)+1
5/8*c*Unintegrable(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
```

```
[Out] (-5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(4*a) + (x*Sqrt[c + a^2*c*x^2]*A
rcTan[a*x]^(5/2))/2 + (15*c*Defer[Int][Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2
], x])/8 + (c*Defer[Int][ArcTan[a*x]^(5/2)/Sqrt[c + a^2*c*x^2], x])/2
```

Rubi steps

$$\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx=-\frac{5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{4a}+\frac{1}{2}x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}+\frac{1}{2}c\int\frac{\tan^{-1}(ax)^{5}}{\sqrt{c+a^2cx}}$$

Mathematica [A] time = 0.49, size = 0, normalized size = 0.00

$$\int \sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.52, size = 0, normalized size = 0.00

$$\int \arctan(ax)^{\frac{5}{2}} \sqrt{a^2 c\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \mathrm{atan}\left(a\, x\right)^{5/2}\, \sqrt{c\, a^2\, x^2 + c}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)*(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.882 $\int \frac{\sqrt{c+a^2cx^2}\ \tan^{-1}(ax)^{5/2}}{x}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}\ \tan^{-1}(ax)^{5/2}}{x},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/x,x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}\ \tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/x,x]
[Out] Defer[Int][(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/x, x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}\ \tan^{-1}(ax)^{5/2}}{x}\,dx=\int \frac{\sqrt{c+a^2cx^2}\ \tan^{-1}(ax)^{5/2}}{x}\,dx$$

Mathematica [A] time = 2.46, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}\ \tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/x,x]
[Out] Integrate[(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.77, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(a x\right)^{\frac{5}{2}} \sqrt{a^{2} c \,x^{2}+c}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/x,x)
```

```
[Out] int(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,\sqrt{c\,a^2\,x^2+c}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2))/x,x)
```

```
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)*(a**2*c*x**2+c)**(1/2)/x,x)
```

```
[Out] Timed out
```

3.883 $\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \left(a^2 c x^2+c\right)^{3/2} \tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx=\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$$

Mathematica [A] time = 1.11, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^2 c x^2+c\right)^{\frac{3}{2}} x^m \arctan\left(ax\right)^{\frac{5}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m*arctan(a*x)^(5/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.90, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{5}{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.884 $\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^{3/2} \tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx=\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$$

Mathematica [A] time = 4.04, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^{3/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.11, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2 \operatorname{atan}(a x)^{5/2} \left(c a^2 x^2 + c\right)^{3/2} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.885 $\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=259

$$-\frac{9c^2\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{64a}-\frac{3c^2\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)}{16a}-\frac{c\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{\tan^{-1}(ax)}},x\right)}{32a}+\frac{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)^{5/2}}{5a^2c}-\frac{x\left(a^2\right.}{}$$

```
[Out] -1/8*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/a+1/5*(a^2*c*x^2+c)^(5/2)*arct
an(a*x)^(5/2)/a^2/c-3/16*c*x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a+1/16*(
a^2*c*x^2+c)^(3/2)*arctan(a*x)^(1/2)/a^2+9/32*c*(a^2*c*x^2+c)^(1/2)*arctan(
a*x)^(1/2)/a^2-3/16*c^2*Unintegrable(arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),
x)/a-9/64*c^2*Unintegrable(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a-1/3
2*c*Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.27, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] (9*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(32*a^2) + ((c + a^2*c*x^2)^(3/
2)*Sqrt[ArcTan[a*x]])/(16*a^2) - (3*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/
2))/(16*a) - (x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/(8*a) + ((c + a^2*
c*x^2)^(5/2)*ArcTan[a*x]^(5/2))/(5*a^2*c) - (9*c^2*Defer[Int][1/(Sqrt[c + a
^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/(64*a) - (c*Defer[Int][Sqrt[c + a^2*c*x^2
]/Sqrt[ArcTan[a*x]], x])/(32*a) - (3*c^2*Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[
c + a^2*c*x^2], x])/(16*a)
```

Rubi steps

$$\begin{aligned}\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}\,dx&=\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}{5a^2c}-\frac{\int\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}\,dx}{2a}\\&=\frac{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{16a^2}-\frac{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{8a}+\frac{\left(c+a^2cx^2\right)^{5}}{5}\\&=\frac{9c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{32a^2}+\frac{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{16a^2}-\frac{3cx\sqrt{c+a^2cx^2}}{16}\end{aligned}$$

Mathematica [A] time = 2.82, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 2.81, size = 0, normalized size = 0.00

$$\int x\left(a^{2}c\,x^{2}+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.886 $\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=212

$$\frac{45}{32}c^2\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)+\frac{3}{8}c^2\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{\sqrt{a^2cx^2+c}},x\right)+\frac{5}{16}c\text{Int}\left(\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)},x\right)+\frac{1}{4}x\left(a^2cx^2+c\right)^{3/2}\text{ta}$$

```
[Out] -5/24*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/a+1/4*x*(a^2*c*x^2+c)^(3/2)*arc
tan(a*x)^(5/2)-15/16*c*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a+3/8*c*x*arct
an(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)+3/8*c^2*Unintegrable(arctan(a*x)^(5/2)/(a
^2*c*x^2+c)^(1/2),x)+45/32*c^2*Unintegrable(arctan(a*x)^(1/2)/(a^2*c*x^2+c)
^(1/2),x)+5/16*c*Unintegrable((a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] (-15*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(16*a) - (5*(c + a^2*c*x^2)^(
3/2)*ArcTan[a*x]^(3/2))/(24*a) + (3*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/
2))/8 + (x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2))/4 + (45*c^2*Defer[Int][
Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2], x])/32 + (5*c*Defer[Int][Sqrt[c + a^
2*c*x^2]*Sqrt[ArcTan[a*x]], x])/16 + (3*c^2*Defer[Int][ArcTan[a*x]^(5/2)/Sq
rt[c + a^2*c*x^2], x])/8
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{5/2}\,dx &= -\frac{5\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{24a}+\frac{1}{4}x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}+\frac{1}{16}(5c)\int\\ &= -\frac{15c\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{16a}-\frac{5\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{24a}+\frac{3}{8}cx\sqrt{c+a^2}\end{aligned}$$

Mathematica [A] time = 1.59, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^{3/2} \tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 1.50, size = 0, normalized size = 0.00

$$\int \left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arctan \left(a x\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.00

$$\int \mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.887 $\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{5/2}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)/x,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2))/x,x]
```

```
[Out] Defer[Int][((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2))/x, x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}{x}\,dx=\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Mathematica [A] time = 2.23, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2))/x,x]
```

```
[Out] Integrate[((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)/x,x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)/x,x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.85, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\, x^{2}+c\right)^{\frac{3}{2}} \arctan \left(a x\right)^{\frac{5}{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2))/x,x)
```

```
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)*atan(a*x)**(5/2)/x,x)
```

```
[Out] Timed out
```

3.888 $\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^m \left(a^2cx^2+c\right)^{5/2} \tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx = \int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$$

Mathematica [A] time = 1.48, size = 0, normalized size = 0.00

$$\int x^m \left(c+a^2cx^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^m*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m \arctan(ax)^{\frac{5}{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m*arctan
(a*x)^(5/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 3.00, size = 0, normalized size = 0.00

$$\int x^{m} \left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int x^m\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^m*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.889 $\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(x^2 \left(a^2 c x^2+c\right)^{5/2} \tan^{-1}(ax)^{5/2},x\right)$$

```
[Out] Unintegrable(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx=\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$$

Mathematica [A] time = 3.48, size = 0, normalized size = 0.00

$$\int x^2 \left(c+a^2 c x^2\right)^{5/2} \tan^{-1}(ax)^{5/2} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
[Out] Integrate[x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 4.22, size = 0, normalized size = 0.00

$$\int x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int x^2\,\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.890 $\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=360

$$-\frac{75c^3\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{896a}-\frac{25c^3\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)}{224a}-\frac{25c^2\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{\tan^{-1}(ax)}},x\right)}{1344a}-\frac{c\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}},x\right)}{112a}-\frac{25c^2x}{}$$

```
[Out] -25/336*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/a-5/84*x*(a^2*c*x^2+c)^(5
/2)*arctan(a*x)^(3/2)/a+1/7*(a^2*c*x^2+c)^(7/2)*arctan(a*x)^(5/2)/a^2/c-25/
224*c^2*x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a+25/672*c*(a^2*c*x^2+c)^(3
/2)*arctan(a*x)^(1/2)/a^2+1/56*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(1/2)/a^2+75
/448*c^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a^2-25/224*c^3*Unintegrable(
arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)/a-1/112*c*Unintegrable((a^2*c*x^2+
c)^(3/2)/arctan(a*x)^(1/2),x)/a-75/896*c^3*Unintegrable(1/(a^2*c*x^2+c)^(1/
2)/arctan(a*x)^(1/2),x)/a-25/1344*c^2*Unintegrable((a^2*c*x^2+c)^(1/2)/arct
an(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.36, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] (75*c^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(448*a^2) + (25*c*(c + a^2*c
*x^2)^(3/2)*Sqrt[ArcTan[a*x]])/(672*a^2) + ((c + a^2*c*x^2)^(5/2)*Sqrt[ArcT
an[a*x]])/(56*a^2) - (25*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(224*
a) - (25*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))/(336*a) - (5*x*(c + a
^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2))/(84*a) + ((c + a^2*c*x^2)^(7/2)*ArcTan[a
*x]^(5/2))/(7*a^2*c) - (75*c^3*Defer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTa
n[a*x]]), x])/(896*a) - (25*c^2*Defer[Int][Sqrt[c + a^2*c*x^2]/Sqrt[ArcTan[
a*x]], x])/(1344*a) - (c*Defer[Int][(c + a^2*c*x^2)^(3/2)/Sqrt[ArcTan[a*x]]
, x])/(112*a) - (25*c^3*Defer[Int][ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2], x
])/(224*a)
```

Rubi steps

$$\begin{aligned}\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx &= \frac{\left(c+a^2cx^2\right)^{7/2}\tan^{-1}(ax)^{5/2}}{7a^2c}-\frac{5\int\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}\,dx}{14a}\\ &= \frac{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}{56a^2}-\frac{5x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{84a}+\frac{\left(c+a^2cx^2\right)}{}\\ &= \frac{25c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{672a^2}+\frac{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}{56a^2}-\frac{25cx\left(c+\right.}{}\\ &= \frac{75c^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{448a^2}+\frac{25c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}{672a^2}+\frac{\left(c+a^2c\right.}{}\end{aligned}$$

Mathematica [A] time = 6.05, size = 0, normalized size = 0.00

$$\int x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.98, size = 0, normalized size = 0.00

$$\int x \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.891 $\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx$

Optimal. Leaf size=307

$$\frac{75}{64}c^3\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)+\frac{5}{16}c^3\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{\sqrt{a^2cx^2+c}},x\right)+\frac{25}{96}c^2\text{Int}\left(\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)},x\right)+\frac{1}{8}c\text{Int}\left(\left(a^2cx^2+\right.\right.$$

```
[Out] -25/144*c*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(3/2)/a-1/12*(a^2*c*x^2+c)^(5/2)*
arctan(a*x)^(3/2)/a+5/24*c*x*(a^2*c*x^2+c)^(3/2)*arctan(a*x)^(5/2)+1/6*x*(a
^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2)-25/32*c^2*arctan(a*x)^(3/2)*(a^2*c*x^2+
c)^(1/2)/a+5/16*c^2*x*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)+5/16*c^3*Uninte
grable(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)+1/8*c*Unintegrable((a^2*c*x
^2+c)^(3/2)*arctan(a*x)^(1/2),x)+75/64*c^3*Unintegrable(arctan(a*x)^(1/2)/(
a^2*c*x^2+c)^(1/2),x)+25/96*c^2*Unintegrable((a^2*c*x^2+c)^(1/2)*arctan(a*x
)^(1/2),x)
```

Rubi [A] time = 0.27, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] (-25*c^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(32*a) - (25*c*(c + a^2*c*x
^2)^(3/2)*ArcTan[a*x]^(3/2))/(144*a) - ((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(
3/2))/(12*a) + (5*c^2*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/16 + (5*c*x*
(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2))/24 + (x*(c + a^2*c*x^2)^(5/2)*ArcT
an[a*x]^(5/2))/6 + (75*c^3*Defer[Int][Sqrt[ArcTan[a*x]]/Sqrt[c + a^2*c*x^2]
, x])/64 + (25*c^2*Defer[Int][Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]], x])/96
 + (c*Defer[Int][(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]], x])/8 + (5*c^3*De
fer[Int][ArcTan[a*x]^(5/2)/Sqrt[c + a^2*c*x^2], x])/16
```

Rubi steps

$$\begin{aligned}\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx &= -\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{12a}+\frac{1}{6}x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}+\frac{1}{8}c\int\left(c+\right.\\ &= -\frac{25c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{144a}-\frac{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}{12a}+\frac{5}{24}cx\left(c+\right.\\ &= -\frac{25c^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{32a}-\frac{25c\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}{144a}-\frac{\left(c+a^2c\right.}{}\end{aligned}$$

Mathematica [A] time = 0.50, size = 0, normalized size = 0.00

$$\int \left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2), x]
```

fricas [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 1.62, size = 0, normalized size = 0.00

$$\int \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.00

$$\int {\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.892 $\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{(a^2cx^2+c)^{5/2}\tan^{-1}(ax)^{5/2}}{x},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2)/x,x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2))/x,x]
[Out] Defer[Int][((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2))/x, x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{5/2}}{x}\,dx=\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Mathematica [A] time = 2.48, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{5/2}}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2))/x,x]
[Out] Integrate[((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2))/x, x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2)/x,x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2)/x,x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 1.84, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^{\frac{5}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2)/x,x)
```

```
[Out] int((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2)/x,x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)*arctan(a*x)^(5/2)/x,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2))/x,x)
```

```
[Out] int((atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2))/x, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)*atan(a*x)**(5/2)/x,x)
```

```
[Out] Timed out
```

3.893 $\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{5/2}}{\sqrt{a^2cx^2+c}}, x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx = \int \frac{x^m \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$$

Mathematica [A] time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
[Out] Integrate[(x^m*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m \arctan(ax)^{\frac{5}{2}}}{\sqrt{a^2cx^2+c}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m*arctan(a*x)^(5/2)/sqrt(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)^{\frac{5}{2}}}{\sqrt{a^{2} c \,x^{2}+c}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.894 $\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=199

$$-\frac{5\mathrm{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{16a^3}+\frac{25\mathrm{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)}{12a^3}+\frac{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{5/2}}{3a^2c}-\frac{2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{5/2}}{3a^4c}+$$

```
[Out] -5/12*x*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a^3/c-2/3*arctan(a*x)^(5/2)*(
a^2*c*x^2+c)^(1/2)/a^4/c+1/3*x^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/a^2/
c+5/8*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/a^4/c+25/12*Unintegrable(arctan
(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)/a^3-5/16*Unintegrable(1/(a^2*c*x^2+c)^(1
/2)/arctan(a*x)^(1/2),x)/a^3
```

Rubi [A] time = 0.47, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^3*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (5*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(8*a^4*c) - (5*x*Sqrt[c + a^2*c*x
^2]*ArcTan[a*x]^(3/2))/(12*a^3*c) - (2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2
))/(3*a^4*c) + (x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/(3*a^2*c) - (5*D
efer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/(16*a^3) + (25*Def
er[Int][ArcTan[a*x]^(3/2)/Sqrt[c + a^2*c*x^2], x])/(12*a^3)
```

Rubi steps

$$\begin{aligned}
\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx &= \frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}{3a^2c}-\frac{2\int \frac{x\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx}{3a^2}-\frac{5\int \frac{x^2\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx}{6a}\\
&= -\frac{5x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{12a^3c}-\frac{2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}{3a^4c}+\frac{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/}}{3a^2c}\\
&= \frac{5\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{8a^4c}-\frac{5x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}{12a^3c}-\frac{2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}{3a^4c}+
\end{aligned}$$

Mathematica [A] time = 4.07, size = 0, normalized size = 0.00

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x^3*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 9.25, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan \left(a x\right)^{\frac{5}{2}}}{\sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.895 $\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=132

$$\frac{15\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{a^2cx^2+c}},x\right)}{8a^2}-\frac{\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{\sqrt{a^2cx^2+c}},x\right)}{2a^2}+\frac{x\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{5/2}}{2a^2c}-\frac{5\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{4a^3c}$$

```
[Out] -5/4*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/a^3/c+1/2*x*arctan(a*x)^(5/2)*(a
^2*c*x^2+c)^(1/2)/a^2/c-1/2*Unintegrable(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1
/2),x)/a^2+15/8*Unintegrable(arctan(a*x)^(1/2)/(a^2*c*x^2+c)^(1/2),x)/a^2
```

Rubi [A] time = 0.25, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (-5*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(4*a^3*c) + (x*Sqrt[c + a^2*c*x^
2]*ArcTan[a*x]^(5/2))/(2*a^2*c) + (15*Defer[Int][Sqrt[ArcTan[a*x]]/Sqrt[c +
 a^2*c*x^2], x])/(8*a^2) - Defer[Int][ArcTan[a*x]^(5/2)/Sqrt[c + a^2*c*x^2]
, x]/(2*a^2)
```

Rubi steps

$$\begin{aligned}\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx &= \frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{2a^2c}-\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx}{2a^2}-\frac{5\int \frac{x\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx}{4a}\\ &= -\frac{5\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{4a^3c}+\frac{x\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{2a^2c}-\frac{\int \frac{\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx}{2a^2}+\frac{15\int \frac{\sqrt{\tan^{-1}(ax)}}{\sqrt{c+a^2cx^2}}\,dx}{8a^2}\end{aligned}$$

Mathematica [A] time = 2.60, size = 0, normalized size = 0.00

$$\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x^2*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 8.69, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)^{\frac{5}{2}}}{\sqrt{a^2 c x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 \operatorname{atan}(a\,x)^{5/2}}{\sqrt{c\,a^2\,x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.896 $\int \frac{x \tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$

Optimal. Leaf size=63

$$\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{5/2}}{a^2c}-\frac{5\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{a^2cx^2+c}},x\right)}{2a}$$

```
[Out] arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/a^2/c-5/2*Unintegrable(arctan(a*x)^(3
/2)/(a^2*c*x^2+c)^(1/2),x)/a
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/(a^2*c) - (5*Defer[Int][ArcTan[a*x]
^(3/2)/Sqrt[c + a^2*c*x^2], x])/(2*a)
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx=\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{a^2c}-\frac{5\int\frac{\tan^{-1}(ax)^{3/2}}{\sqrt{c+a^2cx^2}}\,dx}{2a}$$

Mathematica [A] time = 0.70, size = 0, normalized size = 0.00

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[(x*ArcTan[a*x]^(5/2))/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.23, size = 0, normalized size = 0.00

$$\int \frac{x \arctan(ax)^{\frac{5}{2}}}{\sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\, \mathrm{atan}\left(a\, x\right)^{5/2}}{\sqrt{c\, a^2\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2),x)
```

```
[Out] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.897 $\int \frac{\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Defer[Int][ArcTan[a*x]^(5/2)/Sqrt[c + a^2*c*x^2], x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx = \int \frac{\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$$

Mathematica [A] time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{\sqrt{c+a^2cx^2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/Sqrt[c + a^2*c*x^2],x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/Sqrt[c + a^2*c*x^2], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.38, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{5}{2}}}{\sqrt{a^2 c\,x^2 + c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^(1/2),x)
[Out] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{5}{2}}(ax)}{\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(atan(a*x)**(5/2)/sqrt(c*(a**2*x**2 + 1)), x)
```

3.898 $\int \frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{a^2cx^2+c}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x*Sqrt[c + a^2*c*x^2]),x]
[Out] Defer[Int][ArcTan[a*x]^(5/2)/(x*Sqrt[c + a^2*c*x^2]), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{c+a^2cx^2}}\,dx = \int \frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{c+a^2cx^2}}\,dx$$

Mathematica [A] time = 1.32, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x*Sqrt[c + a^2*c*x^2]),x]
[Out] Integrate[ArcTan[a*x]^(5/2)/(x*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.66, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{5}{2}}}{x\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}(a\,x)^{5/2}}{x\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\mathrm{atan}^{\frac{5}{2}}(ax)}{x\sqrt{c\left(a^2x^2+1\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(x*sqrt(c*(a**2*x**2 + 1))), x)
```

3.899 $\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=65

$$\frac{5}{2}a\mathrm{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{a^2cx^2+c}},x\right)-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{5/2}}{cx}$$

```
[Out] -arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/c/x+5/2*a*Unintegrable(arctan(a*x)^(
3/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] -((Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/(c*x)) + (5*a*Defer[Int][ArcTan[a
*x]^(3/2)/(x*Sqrt[c + a^2*c*x^2]), x])/2
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\sqrt{c+a^2cx^2}}\,dx=-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{cx}+\frac{1}{2}(5a)\int \frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{c+a^2cx^2}}\,dx$$

Mathematica [A] time = 1.45, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x^2*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/(x^2*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.63, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{5}{2}}}{x^2\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c)^(1/2),x)
[Out] int(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^2/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{x^2\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x^2*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(atan(a*x)^(5/2)/(x^2*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x**2/(a**2*c*x**2+c)**(1/2),x)
[Out] Timed out
```

3.900 $\int \frac{\tan^{-1}(ax)^{5/2}}{x^3\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=138

$$\frac{15}{8}a^2\text{Int}\left(\frac{\sqrt{\tan^{-1}(ax)}}{x\sqrt{a^2cx^2+c}},x\right)-\frac{1}{2}a^2\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{a^2cx^2+c}},x\right)-\frac{\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{5/2}}{2cx^2}-\frac{5a\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}{4cx}$$

```
[Out] -5/4*a*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/c/x-1/2*arctan(a*x)^(5/2)*(a^2
*c*x^2+c)^(1/2)/c/x^2-1/2*a^2*Unintegrable(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c
)^(1/2),x)+15/8*a^2*Unintegrable(arctan(a*x)^(1/2)/x/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.42, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^3\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-5*a*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))/(4*c*x) - (Sqrt[c + a^2*c*x^2]
*ArcTan[a*x]^(5/2))/(2*c*x^2) + (15*a^2*Defer[Int][Sqrt[ArcTan[a*x]]/(x*Sqr
t[c + a^2*c*x^2]), x])/8 - (a^2*Defer[Int][ArcTan[a*x]^(5/2)/(x*Sqrt[c + a^
2*c*x^2]), x])/2
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(ax)^{5/2}}{x^3\sqrt{c+a^2cx^2}}\,dx &= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{2cx^2}+\frac{1}{4}(5a)\int \frac{\tan^{-1}(ax)^{3/2}}{x^2\sqrt{c+a^2cx^2}}\,dx-\frac{1}{2}a^2\int \frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{c+a^2cx^2}}\,dx\\ &= -\frac{5a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{4cx}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{2cx^2}-\frac{1}{2}a^2\int \frac{\tan^{-1}(ax)^{5/2}}{x\sqrt{c+a^2cx^2}}\,dx+\frac{1}{8}\end{aligned}$$

Mathematica [A] time = 4.77, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^3\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x^3*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/(x^3*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.43, size = 0, normalized size = 0.00

$$\int \frac{\arctan (ax)^{\frac{5}{2}}}{x^3\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^3/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{x^3\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x^3*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x^3*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x**3/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.901 $\int \frac{\tan^{-1}(ax)^{5/2}}{x^4\sqrt{c+a^2cx^2}}\,dx$

Optimal. Leaf size=208

$$\frac{5}{16}a^3\text{Int}\left(\frac{1}{x\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{25}{12}a^3\text{Int}\left(\frac{\tan^{-1}(ax)^{3/2}}{x\sqrt{a^2cx^2+c}},x\right)+\frac{2a^2\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{5/2}}{3cx}-\frac{5a^2\sqrt{a^2cx^2\cdot}}{}$$

```
[Out] -5/12*a*arctan(a*x)^(3/2)*(a^2*c*x^2+c)^(1/2)/c/x^2-1/3*arctan(a*x)^(5/2)*(
a^2*c*x^2+c)^(1/2)/c/x^3+2/3*a^2*arctan(a*x)^(5/2)*(a^2*c*x^2+c)^(1/2)/c/x-
5/8*a^2*(a^2*c*x^2+c)^(1/2)*arctan(a*x)^(1/2)/c/x-25/12*a^3*Unintegrable(ar
ctan(a*x)^(3/2)/x/(a^2*c*x^2+c)^(1/2),x)+5/16*a^3*Unintegrable(1/x/(a^2*c*x
^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.74, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^4\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] (-5*a^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])/(8*c*x) - (5*a*Sqrt[c + a^2*
c*x^2]*ArcTan[a*x]^(3/2))/(12*c*x^2) - (Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/
2))/(3*c*x^3) + (2*a^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2))/(3*c*x) + (5*
a^3*Defer[Int][1/(x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/16 - (25*a^
3*Defer[Int][ArcTan[a*x]^(3/2)/(x*Sqrt[c + a^2*c*x^2]), x])/12
```

Rubi steps

$$\begin{aligned}
\int \frac{\tan^{-1}(ax)^{5/2}}{x^4\sqrt{c+a^2cx^2}}\,dx &= -\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{3cx^3}+\frac{1}{6}(5a)\int \frac{\tan^{-1}(ax)^{3/2}}{x^3\sqrt{c+a^2cx^2}}\,dx-\frac{1}{3}\left(2a^2\right)\int \frac{\tan^{-1}(ax)^{5/2}}{x^2\sqrt{c+a^2cx^2}}\,dx\\
&= -\frac{5a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{12cx^2}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{3cx^3}+\frac{2a^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{3cx}\\
&= -\frac{5a^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}{8cx}-\frac{5a\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}{12cx^2}-\frac{\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{5/2}}{3cx^3}
\end{aligned}$$

Mathematica [A] time = 17.02, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x^4\sqrt{c+a^2cx^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x^4*Sqrt[c + a^2*c*x^2]),x]
```

```
[Out] Integrate[ArcTan[a*x]^(5/2)/(x^4*Sqrt[c + a^2*c*x^2]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 7.52, size = 0, normalized size = 0.00

$$\int \frac{\arctan (ax)^{\frac{5}{2}}}{x^4\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x^4/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{x^4\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x^4*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x^4*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x**4/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.902 $\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{5/2}}{\left(a^2cx^2+c\right)^{3/2}},x\right)$$

[Out] Unintegrable(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2),x]

[Out] Defer[Int][(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2), x]

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 0.98, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2),x]

[Out] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2), x]

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m \arctan(ax)^{\frac{5}{2}}}{a^4c^2x^4+2\,a^2c^2x^2+c^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^(5/2)/(a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")

[Out] sage0*x

maple [**A**] time = 2.92, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

3.903 $\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^{3/2}} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^2 \tan^{-1}(ax)^{5/2}}{(a^2cx^2+c)^{3/2}}, x\right)$$

```
[Out] Unintegrable(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^{3/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2),x]
[Out] Defer[Int][(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2), x]
```

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^{3/2}} dx = \int \frac{x^2 \tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^{3/2}} dx$$

Mathematica [A] time = 3.67, size = 0, normalized size = 0.00

$$\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^{3/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2),x]
[Out] Integrate[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 8.87, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \arctan \left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

3.904 $\int \frac{x\tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^{3/2}}\,dx$

Optimal. Leaf size=161

$$-\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^2c\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{a^2cx^2+c}}+\frac{5x\tan^{-1}(ax)^{3/2}}{2ac\sqrt{a^2cx^2+c}}+\frac{15\sqrt{\tan^{-1}(ax)}}{4a^2c\sqrt{a^2cx^2+c}}$$

```
[Out] 5/2*x*arctan(a*x)^(3/2)/a/c/(a^2*c*x^2+c)^(1/2)-arctan(a*x)^(5/2)/a^2/c/(a^
2*c*x^2+c)^(1/2)-15/8*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*
Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c/(a^2*c*x^2+c)^(1/2)+15/4*arctan(a*x)^(1/2)
/a^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4930, 4898, 4905, 4904, 3304, 3352}

$$-\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4a^2c\sqrt{a^2cx^2+c}}-\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{a^2cx^2+c}}+\frac{5x\tan^{-1}(ax)^{3/2}}{2ac\sqrt{a^2cx^2+c}}+\frac{15\sqrt{\tan^{-1}(ax)}}{4a^2c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (15*Sqrt[ArcTan[a*x]])/(4*a^2*c*Sqrt[c + a^2*c*x^2]) + (5*x*ArcTan[a*x]^(3/
2))/(2*a*c*Sqrt[c + a^2*c*x^2]) - ArcTan[a*x]^(5/2)/(a^2*c*Sqrt[c + a^2*c*x
^2]) - (15*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x
]]])/(4*a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
```

```
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx = -\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{c+a^2cx^2}}+\frac{5\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{2a}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{4a^2c\sqrt{c+a^2cx^2}}+\frac{5x\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{15\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{8a}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{4a^2c\sqrt{c+a^2cx^2}}+\frac{5x\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{\left(15\sqrt{1+a^2x^2}\right)\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\sqrt{\tan^{-1}(}}}{8ac\sqrt{c+a^2cx^2}}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{4a^2c\sqrt{c+a^2cx^2}}+\frac{5x\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{\left(15\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\cos(x)}{\sqrt{x}}\,dx,\right.}{8a^2c\sqrt{c+a^2cx^2}}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{4a^2c\sqrt{c+a^2cx^2}}+\frac{5x\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{\left(15\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \cos\left(x^2\right)\right.}{4a^2c\sqrt{c+a^2cx^2}}$$

$$= \frac{15\sqrt{\tan^{-1}(ax)}}{4a^2c\sqrt{c+a^2cx^2}}+\frac{5x\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}}-\frac{\tan^{-1}(ax)^{5/2}}{a^2c\sqrt{c+a^2cx^2}}-\frac{15\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(\right.}{4a^2c\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.19, size = 139, normalized size = 0.86

$$\frac{15i\sqrt{a^2x^2+1}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)-15i\sqrt{a^2x^2+1}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+4\tan^{-1}(ax)\left(-4\right.}{16a^2c\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (4*ArcTan[a*x]*(15 + 10*a*x*ArcTan[a*x] - 4*ArcTan[a*x]^2) + (15*I)*Sqrt[1
+ a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] - (15*I)*Sqr
t[1 + a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]])/(16*a^2*c*Sqr
t[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 3.01, size = 0, normalized size = 0.00

$$\int \frac{x \arctan (ax)^{\frac{5}{2}}}{\left(a^2 c\, x^2+c\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\, \mathrm{atan}\left(a\,x\right)^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

3.905 $\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=155

$$\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{a^2cx^2+c}}+\frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{a^2cx^2+c}}-\frac{15x\sqrt{\tan^{-1}(ax)}}{4c\sqrt{a^2cx^2+c}}$$

```
[Out] 5/2*arctan(a*x)^(3/2)/a/c/(a^2*c*x^2+c)^(1/2)+x*arctan(a*x)^(5/2)/c/(a^2*c*
x^2+c)^(1/2)+15/8*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(
1/2)*(a^2*x^2+1)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)-15/4*x*arctan(a*x)^(1/2)/c/(
a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4898, 4905, 4904, 3296, 3305, 3351}

$$\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4ac\sqrt{a^2cx^2+c}}+\frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{a^2cx^2+c}}+\frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{a^2cx^2+c}}-\frac{15x\sqrt{\tan^{-1}(ax)}}{4c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (-15*x*Sqrt[ArcTan[a*x]])/(4*c*Sqrt[c + a^2*c*x^2]) + (5*ArcTan[a*x]^(3/2))
/(2*a*c*Sqrt[c + a^2*c*x^2]) + (x*ArcTan[a*x]^(5/2))/(c*Sqrt[c + a^2*c*x^2]
) + (15*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]]
)/(4*a*c*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
```

```
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx = \frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{c+a^2cx^2}} - \frac{15}{4}\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{3/2}}\,dx$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{c+a^2cx^2}} - \frac{\left(15\sqrt{1+a^2x^2}\right)\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(1+a^2x^2\right)^{3/2}}\,dx}{4c\sqrt{c+a^2cx^2}}$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{c+a^2cx^2}} - \frac{\left(15\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \sqrt{x}\cos(x)\,dx, x, \tan^{-1}(ax)\right.}{4ac\sqrt{c+a^2cx^2}}$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{4c\sqrt{c+a^2cx^2}} + \frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{c+a^2cx^2}} + \frac{\left(15\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\right.}{8ac\sqrt{c+a^2cx^2}}$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{4c\sqrt{c+a^2cx^2}} + \frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{c+a^2cx^2}} + \frac{\left(15\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \sin\left(x\right.\right.}{4ac\sqrt{c+a^2}}$$

$$= -\frac{15x\sqrt{\tan^{-1}(ax)}}{4c\sqrt{c+a^2cx^2}} + \frac{5\tan^{-1}(ax)^{3/2}}{2ac\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{c\sqrt{c+a^2cx^2}} + \frac{15\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-}}\right.}{4ac\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.10, size = 97, normalized size = 0.63

$$\frac{15\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+2\sqrt{\tan^{-1}(ax)}\left(-15ax+4ax\tan^{-1}(ax)^2+10\tan^{-1}(ax)\right)}{8ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^(3/2),x]
```

```
[Out] (2*Sqrt[ArcTan[a*x]]*(-15*a*x + 10*ArcTan[a*x] + 4*a*x*ArcTan[a*x]^2) + 15*
Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(8*a*c
*Sqrt[c + a^2*c*x^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{\arctan\left(ax\right)^{\frac{5}{2}}}{\left(a^{2}c\,x^{2}+c\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^(3/2),x)
```

```
[Out] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(c*(a**2*x**2 + 1))**(3/2), x)
```

3.906 $\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x\left(a^2cx^2+c\right)^{3/2}},x\right)$$

```
[Out] Unintegrable(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(3/2)),x]
[Out] Defer[Int][ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(3/2)), x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx=\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Mathematica [A] time = 2.30, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(3/2)),x]
[Out] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.47, size = 0, normalized size = 0.00

$$\int \frac{\arctan \left(ax\right)^{\frac{5}{2}}}{x\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\mathrm{atan}\left(a\,x\right)}^{5/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x/(a**2*c*x**2+c)**(3/2),x)
```

```
[Out] Timed out
```

3.907 $\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m \tan^{-1}(ax)^{5/2}}{\left(a^2cx^2+c\right)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
[Out] Defer[Int][(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx = \int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Mathematica [A] time = 1.49, size = 0, normalized size = 0.00

$$\int \frac{x^m \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
[Out] Integrate[(x^m*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m \arctan(ax)^{\frac{5}{2}}}{a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m*arctan(a*x)^(5/2)/(a^6*c^3*x^6 + 3*a^4*c^3
*x^4 + 3*a^2*c^3*x^2 + c^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.91, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \arctan \left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^m*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.908 $\int \frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(a^2cx^2+c\right)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^4*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
[Out] Defer[Int][(x^4*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2), x]
```

Rubi steps

$$\int \frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx = \int \frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Mathematica [A] time = 4.14, size = 0, normalized size = 0.00

$$\int \frac{x^4 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^4*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
[Out] Integrate[(x^4*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 10.18, size = 0, normalized size = 0.00

$$\int \frac{x^{4} \arctan\left(ax\right)^{\frac{5}{2}}}{\left(a^{2} c\, x^{2}+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^4\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^4*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.909 $\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=350

$$-\frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(a^2cx^2+c\right)^{3/2}}+\frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(a^2cx^2+c\right)^{3/2}}-\frac{45\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{16a^4c^2\sqrt{a^2cx^2+c}}+\frac{5\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{t\right.}}{144a^4c^2\sqrt{a^2cx^2+}}$$

```
[Out] 5/18*x^3*arctan(a*x)^(3/2)/a/c/(a^2*c*x^2+c)^(3/2)-1/3*x^2*arctan(a*x)^(5/2
)/a^2/c/(a^2*c*x^2+c)^(3/2)+5/3*x*arctan(a*x)^(3/2)/a^3/c^2/(a^2*c*x^2+c)^(
1/2)-2/3*arctan(a*x)^(5/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)+5/864*FresnelC(6^(1/
2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c^2/(
a^2*c*x^2+c)^(1/2)-45/32*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/
2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)+45/16*arctan(a*x)
^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-5/144*cos(3*arctan(a*x))*(a^2*x^2+1)^(1/
2)*arctan(a*x)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.71, antiderivative size = 350, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 11, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.423, Rules used = {4940, 4930, 4898, 4905, 4904, 3304, 3352, 4971, 4970, 3312, 3296}

$$-\frac{45\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{16a^4c^2\sqrt{a^2cx^2+c}}+\frac{5\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{144a^4c^2\sqrt{a^2cx^2+c}}+\frac{5x\tan^{-1}(ax}{3a^3c^2\sqrt{a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (45*Sqrt[ArcTan[a*x]])/(16*a^4*c^2*Sqrt[c + a^2*c*x^2]) + (5*x^3*ArcTan[a*x
]^(3/2))/(18*a*c*(c + a^2*c*x^2)^(3/2)) + (5*x*ArcTan[a*x]^(3/2))/(3*a^3*c^
2*Sqrt[c + a^2*c*x^2]) - (x^2*ArcTan[a*x]^(5/2))/(3*a^2*c*(c + a^2*c*x^2)^(
3/2)) - (2*ArcTan[a*x]^(5/2))/(3*a^4*c^2*Sqrt[c + a^2*c*x^2]) - (5*Sqrt[1 +
 a^2*x^2]*Sqrt[ArcTan[a*x]]*Cos[3*ArcTan[a*x]])/(144*a^4*c^2*Sqrt[c + a^2*c
*x^2]) - (45*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a
*x]]])/(16*a^4*c^2*Sqrt[c + a^2*c*x^2]) + (5*Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*F
resnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(144*a^4*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
```

```
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{5}{12}\int \frac{x^3\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{2\int \frac{x\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}}{3a^2c}$$

$$= \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{2\tan^{-1}(ax)^{5/2}}{3a^4c^2\sqrt{c+a^2cx^2}} + \frac{5\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3a^3c}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{2a^4c^2\sqrt{c+a^2cx^2}} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{2a^4c^2\sqrt{c+a^2cx^2}} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{2a^4c^2\sqrt{c+a^2cx^2}} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}$$

$$= \frac{45\sqrt{\tan^{-1}(ax)}}{16a^4c^2\sqrt{c+a^2cx^2}} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}$$

$$= \frac{45\sqrt{\tan^{-1}(ax)}}{16a^4c^2\sqrt{c+a^2cx^2}} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}$$

$$= \frac{45\sqrt{\tan^{-1}(ax)}}{16a^4c^2\sqrt{c+a^2cx^2}} + \frac{5x^3\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{3a^3c^2\sqrt{c+a^2cx^2}} - \frac{x^2\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}}$$

Mathematica [C] time = 0.57, size = 370, normalized size = 1.06

$$3360a^3x^3\tan^{-1}(ax)^2 - 1728a^2x^2\tan^{-1}(ax)^3 + 5040a^2x^2\tan^{-1}(ax) - 5ia^2x^2\sqrt{3a^2x^2+3}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-3\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (4800*ArcTan[a*x] + 5040*a^2*x^2*ArcTan[a*x] + 2880*a*x*ArcTan[a*x]^2 + 336
0*a^3*x^3*ArcTan[a*x]^2 - 1152*ArcTan[a*x]^3 - 1728*a^2*x^2*ArcTan[a*x]^3 +
 (1215*I)*(1 + a^2*x^2)^(3/2)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan
[a*x]] - (1215*I)*(1 + a^2*x^2)^(3/2)*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcT
an[a*x]] - (5*I)*Sqrt[3 + 3*a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*
I)*ArcTan[a*x]] - (5*I)*a^2*x^2*Sqrt[3 + 3*a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*
Gamma[1/2, (-3*I)*ArcTan[a*x]] + (5*I)*Sqrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*
x]]*Gamma[1/2, (3*I)*ArcTan[a*x]] + (5*I)*a^2*x^2*Sqrt[3 + 3*a^2*x^2]*Sqrt[
I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])/(1728*a^4*c^2*(1 + a^2*x^2)*S
qrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 8.89, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \arctan\left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c\, x^{2}+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^3*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.910 $\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}} \, dx$

Optimal. Leaf size=295

$$-\frac{5x\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{a^2cx^2+c}}+\frac{5x^2\tan^{-1}(ax)^{3/2}}{18ac\left(a^2cx^2+c\right)^{3/2}}+\frac{x^3\tan^{-1}(ax)^{5/2}}{3c\left(a^2cx^2+c\right)^{3/2}}-\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(a^2cx^2+c\right)^{3/2}}+\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan\right.}{16a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 5/18*x^2*arctan(a*x)^(3/2)/a/c/(a^2*c*x^2+c)^(3/2)+1/3*x^3*arctan(a*x)^(5/2
)/c/(a^2*c*x^2+c)^(3/2)+5/9*arctan(a*x)^(3/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)-5
/864*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)+15/32*FresnelS(2^(1/2)/Pi^(1/2)*arcta
n(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2
)-5/36*x^3*arctan(a*x)^(1/2)/c/(a^2*c*x^2+c)^(3/2)-5/6*x*arctan(a*x)^(1/2)/
a^2/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.78, antiderivative size = 295, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 11, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.423, Rules used = {4944, 4940, 4930, 4905, 4904, 3296, 3305, 3351, 4971, 4970, 3312}

$$\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{16a^3c^2\sqrt{a^2cx^2+c}}-\frac{5\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{144a^3c^2\sqrt{a^2cx^2+c}}-\frac{5x\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{a^2cx^2+c}}+\frac{5\tan^{-1}(ax}{9a^3c^2\sqrt{a^2cx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-5*x^3*Sqrt[ArcTan[a*x]])/(36*c*(c + a^2*c*x^2)^(3/2)) - (5*x*Sqrt[ArcTan[
a*x]])/(6*a^2*c^2*Sqrt[c + a^2*c*x^2]) + (5*x^2*ArcTan[a*x]^(3/2))/(18*a*c*
(c + a^2*c*x^2)^(3/2)) + (5*ArcTan[a*x]^(3/2))/(9*a^3*c^2*Sqrt[c + a^2*c*x^
2]) + (x^3*ArcTan[a*x]^(5/2))/(3*c*(c + a^2*c*x^2)^(3/2)) + (15*Sqrt[Pi/2]*
Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(16*a^3*c^2*Sqrt[
c + a^2*c*x^2]) - (5*Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[
ArcTan[a*x]]])/(144*a^3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4940

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_)*((d_) + (e_.)
*(x_)^2)^(q_), x_Symbol] :> Simp[(b*p*(f*x)^m*(d + e*x^2)^(q + 1)*(a + b*Ar
cTan[c*x])^(p - 1))/(c*d*m^2), x] + (Dist[(f^2*(m - 1))/(c^2*d*m), Int[(f*x
)^(m - 2)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(
p - 1))/m^2, Int[(f*x)^m*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x]
- Simp[(f*(f*x)^(m - 1)*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(c^2*d*m
), x]) /; FreeQ[{a, b, c, d, e, f, m}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q +
 2, 0] && LtQ[q, -1] && GtQ[p, 1]
```

Rule 4944

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(d + e*x^2)^(q + 1)*(a +
 b*ArcTan[c*x])^p)/(d*f*(m + 1)), x] - Dist[(b*c*p)/(f*(m + 1)), Int[(f*x)^
(m + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p - 1), x], x] /; FreeQ[{a, b, c
, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 3, 0] && GtQ[p, 0] &
& NeQ[m, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
```

tegerQ[q] || GtQ[d, 0])

Rubi steps

$$\int \frac{x^2 \tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{x^3 \tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{1}{6}(5a)\int \frac{x^3 \tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$$

$$= -\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(c+a^2cx^2\right)^{3/2}} + \frac{5x^2 \tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x^3 \tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{1}{72}(5a)\int \frac{}{\left(c+a^2cx^2\right)}$$

$$= -\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(c+a^2cx^2\right)^{3/2}} + \frac{5x^2 \tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{9a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3 \tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - $$

$$= -\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(c+a^2cx^2\right)^{3/2}} + \frac{5x^2 \tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{9a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3 \tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + $$

$$= -\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(c+a^2cx^2\right)^{3/2}} + \frac{5x^2 \tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{9a^3c^2\sqrt{c+a^2cx^2}} + \frac{x^3 \tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + $$

$$= -\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(c+a^2cx^2\right)^{3/2}} - \frac{5x\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x^2 \tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{9a^3c^2\sqrt{c+a^2cx^2}} + $$

$$= -\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(c+a^2cx^2\right)^{3/2}} - \frac{5x\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x^2 \tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{9a^3c^2\sqrt{c+a^2cx^2}} + $$

$$= -\frac{5x^3\sqrt{\tan^{-1}(ax)}}{36c\left(c+a^2cx^2\right)^{3/2}} - \frac{5x\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x^2 \tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{9a^3c^2\sqrt{c+a^2cx^2}} + $$

Mathematica [C] time = 1.13, size = 287, normalized size = 0.97

$$35\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}\sqrt{\tan^{-1}(ax)}\left(3\sqrt{3}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)\right)-15\left(a^2x^2+1\right)^{3/2}\left(3\sqrt{-i}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-24*ArcTan[a*x]*(5*a*x*(6 + 7*a^2*x^2) - 10*(2 + 3*a^2*x^2)*ArcTan[a*x] -
12*a^3*x^3*ArcTan[a*x]^2) + 35*Sqrt[6*Pi]*(1 + a^2*x^2)^(3/2)*Sqrt[ArcTan[a
*x]]*(3*Sqrt[3]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] - FresnelS[Sqrt[6/Pi
]*Sqrt[ArcTan[a*x]]]) - 15*(1 + a^2*x^2)^(3/2)*(3*Sqrt[(-I)*ArcTan[a*x]]*Ga
mma[1/2, (-I)*ArcTan[a*x]] + 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]
] + Sqrt[3]*(Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] + Sqrt[I
*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])))/(864*a^3*c*(c + a^2*c*x^2)^(
3/2)*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 8.79, size = 0, normalized size = 0.00

$$\int \frac{x^2 \arctan(ax)^{\frac{5}{2}}}{\left(a^2 c\, x^2 + c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\, \mathrm{atan}\left(a\, x\right)^{5/2}}{\left(c\, a^2\, x^2 + c\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x^2*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.911 $\int \frac{x\tan^{-1}(ax)^{5/2}}{(c+a^2cx^2)^{5/2}}\,dx$

Optimal. Leaf size=293

$$-\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{16a^2c^2\sqrt{a^2cx^2+c}}-\frac{5\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{144a^2c^2\sqrt{a^2cx^2+c}}+\frac{5x\tan^{-1}(ax)^{3/2}}{9ac^2\sqrt{a^2cx^2+c}}+\frac{5\sqrt{\tan^{-1}(}}{6a^2c^2\sqrt{a^2c}}$$

```
[Out] 5/18*x*arctan(a*x)^(3/2)/a/c/(a^2*c*x^2+c)^(3/2)-1/3*arctan(a*x)^(5/2)/a^2/
c/(a^2*c*x^2+c)^(3/2)+5/9*x*arctan(a*x)^(3/2)/a/c^2/(a^2*c*x^2+c)^(1/2)-5/8
64*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1
)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)-15/32*FresnelC(2^(1/2)/Pi^(1/2)*arctan(
a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)+
5/36*arctan(a*x)^(1/2)/a^2/c/(a^2*c*x^2+c)^(3/2)+5/6*arctan(a*x)^(1/2)/a^2/
c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.45, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4930, 4900, 4898, 4905, 4904, 3304, 3352, 3312}

$$-\frac{15\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{16a^2c^2\sqrt{a^2cx^2+c}}-\frac{5\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{144a^2c^2\sqrt{a^2cx^2+c}}+\frac{5x\tan^{-1}(ax)}{9ac^2\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (5*Sqrt[ArcTan[a*x]])/(36*a^2*c*(c + a^2*c*x^2)^(3/2)) + (5*Sqrt[ArcTan[a*x
]])/(6*a^2*c^2*Sqrt[c + a^2*c*x^2]) + (5*x*ArcTan[a*x]^(3/2))/(18*a*c*(c +
a^2*c*x^2)^(3/2)) + (5*x*ArcTan[a*x]^(3/2))/(9*a*c^2*Sqrt[c + a^2*c*x^2]) -
 ArcTan[a*x]^(5/2)/(3*a^2*c*(c + a^2*c*x^2)^(3/2)) - (15*Sqrt[Pi/2]*Sqrt[1
+ a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(16*a^2*c^2*Sqrt[c + a^2
*c*x^2]) - (5*Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[
a*x]]])/(144*a^2*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
```

```
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}}dx = -\frac{\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\int \frac{\tan^{-1}(ax)^{3/2}}{\left(c+a^2cx^2\right)^{5/2}}dx}{6a}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{36a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} - \frac{\tan^{-1}(ax)^{5/2}}{3a^2c\left(c+a^2cx^2\right)^{3/2}} - \frac{5\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}}}}{72a}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{36a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{9ac^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{36a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{9ac^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{36a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{9ac^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{36a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{9ac^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{36a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{9ac^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

$$= \frac{5\sqrt{\tan^{-1}(ax)}}{36a^2c\left(c+a^2cx^2\right)^{3/2}} + \frac{5\sqrt{\tan^{-1}(ax)}}{6a^2c^2\sqrt{c+a^2cx^2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5x\tan^{-1}(ax)^{3/2}}{9ac^2\sqrt{c+a^2cx^2}} - \frac{}{3a}$$

Mathematica [C] time = 0.54, size = 356, normalized size = 1.22

$$\frac{960a^3x^3\tan^{-1}(ax)^2 + 1440a^2x^2\tan^{-1}(ax) + 5ia^2x^2\sqrt{3a^2x^2+3}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-3i\tan^{-1}(ax)\right) - 5ia^2x^2\sqrt{3}}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*ArcTan[a*x]^(5/2))/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (1680*ArcTan[a*x] + 1440*a^2*x^2*ArcTan[a*x] + 1440*a*x*ArcTan[a*x]^2 + 960
*a^3*x^3*ArcTan[a*x]^2 - 576*ArcTan[a*x]^3 + (405*I)*(1 + a^2*x^2)^(3/2)*Sq
rt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] - (405*I)*(1 + a^2*x^2)^(
3/2)*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + (5*I)*Sqrt[3 + 3*a^2*x
^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] + (5*I)*a^2*x^2*S
qrt[3 + 3*a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] -
(5*I)*Sqrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]]
 - (5*I)*a^2*x^2*Sqrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*A
rcTan[a*x]])/(1728*a^2*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*
x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 3.08, size = 0, normalized size = 0.00

$$\int \frac{x \arctan \left(a x\right)^{\frac{5}{2}}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}}{{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int((x*atan(a*x)^(5/2))/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**(5/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.912 $\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=337

$$\frac{45\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{16ac^2\sqrt{a^2cx^2+c}}+\frac{5\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{144ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^{5/2}}{3c^2\sqrt{a^2cx^2+c}}+\frac{5\tan^{-1}(ax)^{3/}}{3ac^2\sqrt{a^2cx^2+}}$$

```
[Out] 5/18*arctan(a*x)^(3/2)/a/c/(a^2*c*x^2+c)^(3/2)+1/3*x*arctan(a*x)^(5/2)/c/(a
^2*c*x^2+c)^(3/2)+5/3*arctan(a*x)^(3/2)/a/c^2/(a^2*c*x^2+c)^(1/2)+2/3*x*arc
tan(a*x)^(5/2)/c^2/(a^2*c*x^2+c)^(1/2)+5/864*FresnelS(6^(1/2)/Pi^(1/2)*arct
an(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)
+45/32*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x
^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)-45/16*x*arctan(a*x)^(1/2)/c^2/(a^2*c*
x^2+c)^(1/2)-5/144*sin(3*arctan(a*x))*(a^2*x^2+1)^(1/2)*arctan(a*x)^(1/2)/a
/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 337, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4900, 4898, 4905, 4904, 3296, 3305, 3351, 3312}

$$\frac{45\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{16ac^2\sqrt{a^2cx^2+c}}+\frac{5\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{144ac^2\sqrt{a^2cx^2+c}}+\frac{2x\tan^{-1}(ax)^{5/2}}{3c^2\sqrt{a^2cx^2+c}}+\frac{5\tan^{-1}(ax)^{3/}}{3ac^2\sqrt{a^2cx^2+}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (-45*x*Sqrt[ArcTan[a*x]])/(16*c^2*Sqrt[c + a^2*c*x^2]) + (5*ArcTan[a*x]^(3/
2))/(18*a*c*(c + a^2*c*x^2)^(3/2)) + (5*ArcTan[a*x]^(3/2))/(3*a*c^2*Sqrt[c
+ a^2*c*x^2]) + (x*ArcTan[a*x]^(5/2))/(3*c*(c + a^2*c*x^2)^(3/2)) + (2*x*Ar
cTan[a*x]^(5/2))/(3*c^2*Sqrt[c + a^2*c*x^2]) + (45*Sqrt[Pi/2]*Sqrt[1 + a^2*
x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(16*a*c^2*Sqrt[c + a^2*c*x^2])
 + (5*Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/
(144*a*c^2*Sqrt[c + a^2*c*x^2]) - (5*Sqrt[1 + a^2*x^2]*Sqrt[ArcTan[a*x]]*Si
n[3*ArcTan[a*x]])/(144*a*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3296

```
Int[((c_.) + (d_.)*(x_))^(m_.)*sin[(e_.) + (f_.)*(x_)], x_Symbol] :> -Simp[
((c + d*x)^m*Cos[e + f*x])/f, x] + Dist[(d*m)/f, Int[(c + d*x)^(m - 1)*Cos[
e + f*x], x], x] /; FreeQ[{c, d, e, f}, x] && GtQ[m, 0]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4898

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/((d_) + (e_.)*(x_)^2)^(3/2), x_
Symbol] :> Simp[(b*p*(a + b*ArcTan[c*x])^(p - 1))/(c*d*Sqrt[d + e*x^2]), x]
 + (-Dist[b^2*p*(p - 1), Int[(a + b*ArcTan[c*x])^(p - 2)/(d + e*x^2)^(3/2),
 x], x] + Simp[(x*(a + b*ArcTan[c*x])^p)/(d*Sqrt[d + e*x^2]), x]) /; FreeQ[
{a, b, c, d, e}, x] && EqQ[e, c^2*d] && GtQ[p, 1]
```

Rule 4900

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[(b*p*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p - 1))/(4*c*d
*(q + 1)^2), x] + (Dist[(2*q + 3)/(2*d*(q + 1)), Int[(d + e*x^2)^(q + 1)*(a
 + b*ArcTan[c*x])^p, x], x] - Dist[(b^2*p*(p - 1))/(4*(q + 1)^2), Int[(d +
e*x^2)^q*(a + b*ArcTan[c*x])^(p - 2), x], x] - Simp[(x*(d + e*x^2)^(q + 1)*
(a + b*ArcTan[c*x])^p)/(2*d*(q + 1)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[q, -1] && GtQ[p, 1] && NeQ[q, -3/2]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{5/2}}\,dx = \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} - \frac{5}{12}\int \frac{\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^{5/2}}\,dx + \frac{2\int \frac{\tan^{-1}(ax)^{5/2}}{\left(c+a^2cx^2\right)^{3/2}}\,dx}{3c}$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{5/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{5\int \frac{\sqrt{\mathrm{ta}}}{(c+a}}{}$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{5/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{\left(5\sqrt{1+}\right.}{}$$

$$= \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan^{-1}(ax)^{5/2}}{3c^2\sqrt{c+a^2cx^2}} - \frac{\left(5\sqrt{1+}\right.}{}$$

$$= -\frac{5x\sqrt{\tan^{-1}(ax)}}{2c^2\sqrt{c+a^2cx^2}} + \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\tan}{3c^2\sqrt{c}}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{16c^2\sqrt{c+a^2cx^2}} + \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\,\mathrm{ta}}{3c^2\sqrt{}}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{16c^2\sqrt{c+a^2cx^2}} + \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\,\mathrm{ta}}{3c^2\sqrt{}}$$

$$= -\frac{45x\sqrt{\tan^{-1}(ax)}}{16c^2\sqrt{c+a^2cx^2}} + \frac{5\tan^{-1}(ax)^{3/2}}{18ac\left(c+a^2cx^2\right)^{3/2}} + \frac{5\tan^{-1}(ax)^{3/2}}{3ac^2\sqrt{c+a^2cx^2}} + \frac{x\tan^{-1}(ax)^{5/2}}{3c\left(c+a^2cx^2\right)^{3/2}} + \frac{2x\,\mathrm{ta}}{3c^2\sqrt{}}$$

Mathematica [A] time = 0.28, size = 176, normalized size = 0.52

$$\frac{1215\sqrt{2\pi}\left(a^2x^2+1\right)^{3/2}S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+5\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+24\sqrt{\tan^{-1}(ax)}\left(-5a\right.}{864c^2\left(a^3x^2+a\right)\sqrt{a^2cx^2+c}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[ArcTan[a*x]^(5/2)/(c + a^2*c*x^2)^(5/2),x]
```

```
[Out] (24*Sqrt[ArcTan[a*x]]*(-5*a*x*(21 + 20*a^2*x^2) + 10*(7 + 6*a^2*x^2)*ArcTan
[a*x] + 12*a*x*(3 + 2*a^2*x^2)*ArcTan[a*x]^2) + 1215*Sqrt[2*Pi]*(1 + a^2*x^
2)^(3/2)*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + 5*Sqrt[6*Pi]*(1 + a^2*x^2
)^(3/2)*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(864*c^2*(a + a^3*x^2)*Sqrt
[c + a^2*c*x^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.47, size = 0, normalized size = 0.00

$$\int \frac{\arctan (ax)^{\frac{5}{2}}}{\left(a^2 c\, x^2+c\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\, x\right)^{5/2}}{{\left(c\, a^2\, x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^(5/2),x)
```

```
[Out] int(atan(a*x)^(5/2)/(c + a^2*c*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Integral(atan(a*x)**(5/2)/(c*(a**2*x**2 + 1))**(5/2), x)
```

3.913 $\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\tan^{-1}(ax)^{5/2}}{x\left(a^2cx^2+c\right)^{5/2}},x\right)$$

[Out] Unintegrable(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(5/2),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(5/2)),x]

[Out] Defer[Int][ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(5/2)), x]

Rubi steps

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx=\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Mathematica [A] time = 2.65, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(ax)^{5/2}}{x\left(c+a^2cx^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(5/2)),x]

[Out] Integrate[ArcTan[a*x]^(5/2)/(x*(c + a^2*c*x^2)^(5/2)), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.57, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)^{\frac{5}{2}}}{x\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

```
[Out] int(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^(5/2)/x/(a^2*c*x^2+c)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\mathrm{atan}\left(a\,x\right)^{5/2}}{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(atan(a*x)^(5/2)/(x*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**(5/2)/x/(a**2*c*x**2+c)**(5/2),x)
```

```
[Out] Timed out
```

3.914 $\int \frac{x^m(c+a^2cx^2)}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{x^m\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 2.11, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)x^m}{\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m/sqrt(arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.39, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)}{\sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
[Out] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\left(c\,a^2\,x^2+c\right)}{\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2))/atan(a*x)^(1/2),x)
[Out] int((x^m*(c + a^2*c*x^2))/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x^{m}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{a^{2} x^{2} x^{m}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)/atan(a*x)**(1/2),x)
[Out] c*(Integral(x**m/sqrt(atan(a*x)), x) + Integral(a**2*x**2*x**m/sqrt(atan(a*
x)), x))
```

3.915 $\int \frac{x(c+a^2cx^2)}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=23

$$\operatorname{Int}\left(\frac{x\left(a^2cx^2+c\right)}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.07, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2))/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.69, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)}{\sqrt{\arctan\left(a x\right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\left(c\,a^2\,x^2+c\right)}{\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2))/atan(a*x)^(1/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2))/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{x}{\sqrt{\operatorname{atan}{\left(a x\right)}}}\, dx + \int \frac{a^{2} x^{3}}{\sqrt{\operatorname{atan}{\left(a x\right)}}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)/atan(a*x)**(1/2),x)
```

```
[Out] c*(Integral(x/sqrt(atan(a*x)), x) + Integral(a**2*x**3/sqrt(atan(a*x)), x))
```

3.916 $\int \frac{c+a^2cx^2}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{a^2cx^2+c}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(c + a^2*c*x^2)/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{c+a^2cx^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.11, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(c + a^2*c*x^2)/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A]   time = 1.41, size = 0, normalized size = 0.00

$$\int \frac{a^{2} c \,x^{2}+c}{\sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{c\,a^2\,x^2+c}{\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/atan(a*x)^(1/2),x)
```

```
[Out] int((c + a^2*c*x^2)/atan(a*x)^(1/2), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{a^{2} x^{2}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{1}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/atan(a*x)**(1/2),x)
```

```
[Out] c*(Integral(a**2*x**2/sqrt(atan(a*x)), x) + Integral(1/sqrt(atan(a*x)), x))
```

3.917 $\int \frac{c+a^2cx^2}{x\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{a^2cx^2+c}{x\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/x/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][(c + a^2*c*x^2)/(x*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{x\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{c+a^2cx^2}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.51, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[(c + a^2*c*x^2)/(x*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.94, size = 0, normalized size = 0.00

$$\int \frac{a^2 c\, x^2 + c}{x\sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/x/arctan(a*x)^(1/2),x)
[Out] int((a^2*c*x^2+c)/x/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{c\, a^2\, x^2 + c}{x\, \sqrt{\mathrm{atan}\left(a\, x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/(x*atan(a*x)^(1/2)),x)
[Out] int((c + a^2*c*x^2)/(x*atan(a*x)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{1}{x\sqrt{\operatorname{atan}\left(a x\right)}}\, dx + \int \frac{a^2 x}{\sqrt{\operatorname{atan}\left(a x\right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/x/atan(a*x)**(1/2),x)
[Out] c*(Integral(1/(x*sqrt(atan(a*x))), x) + Integral(a**2*x/sqrt(atan(a*x)), x)
)
```

3.918 $\int \frac{x^m\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^2}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.39, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)x^m}{\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m/sqrt(arctan(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.78, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{2}}{\sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^2}{\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^(1/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x^{m}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{2 a^{2} x^{2} x^{m}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{a^{4} x^{4} x^{m}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] c**2*(Integral(x**m/sqrt(atan(a*x)), x) + Integral(2*a**2*x**2*x**m/sqrt(at
an(a*x)), x) + Integral(a**4*x**4*x**m/sqrt(atan(a*x)), x))
```

3.919 $\int \frac{x\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^2}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.28, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2)^2)/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 2.08, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2}c\,x^{2}+c\right)^{2}}{\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\left(c\,a^{2}\,x^{2}+c\right)^{2}}{\sqrt{\mathrm{atan}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^(1/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2}\left(\int \frac{x}{\sqrt{\operatorname{atan}{\left(ax\right)}}}\,dx+\int \frac{2a^{2}x^{3}}{\sqrt{\operatorname{atan}{\left(ax\right)}}}\,dx+\int \frac{a^{4}x^{5}}{\sqrt{\operatorname{atan}{\left(ax\right)}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] c**2*(Integral(x/sqrt(atan(a*x)), x) + Integral(2*a**2*x**3/sqrt(atan(a*x))
, x) + Integral(a**4*x**5/sqrt(atan(a*x)), x))
```

3.920 $\int \frac{\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^2/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^2/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.96, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\, x^2 + c\right)^2}{\sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\, a^2\, x^2 + c\right)^2}{\sqrt{\mathrm{atan}\left(a\, x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/atan(a*x)^(1/2),x)
```

```
[Out] int((c + a^2*c*x^2)^2/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2 \left(\int \frac{2a^2x^2}{\sqrt{\mathrm{atan}\,(ax)}}\, dx + \int \frac{a^4x^4}{\sqrt{\mathrm{atan}\,(ax)}}\, dx + \int \frac{1}{\sqrt{\mathrm{atan}\,(ax)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] c**2*(Integral(2*a**2*x**2/sqrt(atan(a*x)), x) + Integral(a**4*x**4/sqrt(at
an(a*x)), x) + Integral(1/sqrt(atan(a*x)), x))
```

3.921 $\int \frac{\left(c+a^2 c x^2\right)^2}{x \sqrt{\tan^{-1}(a x)}} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2 c x^2+c\right)^2}{x \sqrt{\tan^{-1}(a x)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/x/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2 c x^2\right)^2}{x \sqrt{\tan^{-1}(a x)}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][(c + a^2*c*x^2)^2/(x*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{\left(c+a^2 c x^2\right)^2}{x \sqrt{\tan^{-1}(a x)}} \, dx=\int \frac{\left(c+a^2 c x^2\right)^2}{x \sqrt{\tan^{-1}(a x)}} \, dx$$

Mathematica [A] time = 1.42, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2 c x^2\right)^2}{x \sqrt{\tan^{-1}(a x)}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[(c + a^2*c*x^2)^2/(x*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.86, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{2}}{x \sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/x/arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^2/x/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^2}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/(x*atan(a*x)^(1/2)),x)
```

```
[Out] int((c + a^2*c*x^2)^2/(x*atan(a*x)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{1}{x \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{2 a^{2} x}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{a^{4} x^{3}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/x/atan(a*x)**(1/2),x)
```

```
[Out] c**2*(Integral(1/(x*sqrt(atan(a*x))), x) + Integral(2*a**2*x/sqrt(atan(a*x)
), x) + Integral(a**4*x**3/sqrt(atan(a*x)), x))
```

3.922 $\int \frac{x^m\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\operatorname{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^3}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.84, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m}{\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m/sqrt(arcta
n(a*x)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [**A**] time = 4.69, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\, x^2+c\right)^3}{\sqrt{\arctan \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m \left(c\, a^2\, x^2+c\right)^3}{\sqrt{\mathrm{atan}\left(a\, x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^(1/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^(1/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.923 $\int \frac{x(c+a^2cx^2)^3}{\sqrt{\tan^{-1}(ax)}} \, dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^3}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}} \, dx = \int \frac{x\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}} \, dx$$

Mathematica [A] time = 1.30, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\sqrt{\tan^{-1}(ax)}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2)^3)/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.81, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2}c\,x^{2}+c\right)^{3}}{\sqrt{\arctan\left(ax\right)}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\left(c\,a^{2}\,x^{2}+c\right)^{3}}{\sqrt{\mathrm{atan}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^(1/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{x}{\sqrt{\operatorname{atan}\left(ax\right)}}\,dx+\int \frac{3a^{2}x^{3}}{\sqrt{\operatorname{atan}\left(ax\right)}}\,dx+\int \frac{3a^{4}x^{5}}{\sqrt{\operatorname{atan}\left(ax\right)}}\,dx+\int \frac{a^{6}x^{7}}{\sqrt{\operatorname{atan}\left(ax\right)}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] c**3*(Integral(x/sqrt(atan(a*x)), x) + Integral(3*a**2*x**3/sqrt(atan(a*x))
, x) + Integral(3*a**4*x**5/sqrt(atan(a*x)), x) + Integral(a**6*x**7/sqrt(a
tan(a*x)), x))
```

3.924 $\int \frac{(c+a^2cx^2)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{(a^2cx^2+c)^3}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3}{\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{(c+a^2cx^2)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.79, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.43, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3}}{\sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^3}{\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/atan(a*x)^(1/2),x)
```

```
[Out] int((c + a^2*c*x^2)^3/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{3 a^{2} x^{2}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{3 a^{4} x^{4}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{a^{6} x^{6}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx + \int \frac{1}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] c**3*(Integral(3*a**2*x**2/sqrt(atan(a*x)), x) + Integral(3*a**4*x**4/sqrt(
atan(a*x)), x) + Integral(a**6*x**6/sqrt(atan(a*x)), x) + Integral(1/sqrt(a
tan(a*x)), x))
```

3.925 $\int \frac{\left(c+a^2cx^2\right)^3}{x\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3}{x\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/x/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][(c + a^2*c*x^2)^3/(x*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{\left(c+a^2cx^2\right)^3}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.45, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[(c + a^2*c*x^2)^3/(x*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.26, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{3}}{x\sqrt{\arctan\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/x/arctan(a*x)^(1/2),x)
[Out] int((a^2*c*x^2+c)^3/x/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\,a^2\,x^2+c\right)^3}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/(x*atan(a*x)^(1/2)),x)
[Out] int((c + a^2*c*x^2)^3/(x*atan(a*x)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{1}{x\sqrt{\operatorname{atan}{\left(ax \right)}}}\,dx + \int \frac{3a^{2}x}{\sqrt{\operatorname{atan}{\left(ax \right)}}}\,dx + \int \frac{3a^{4}x^{3}}{\sqrt{\operatorname{atan}{\left(ax \right)}}}\,dx + \int \frac{a^{6}x^{5}}{\sqrt{\operatorname{atan}{\left(ax \right)}}}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/x/atan(a*x)**(1/2),x)
[Out] c**3*(Integral(1/(x*sqrt(atan(a*x))), x) + Integral(3*a**2*x/sqrt(atan(a*x)
), x) + Integral(3*a**4*x**3/sqrt(atan(a*x)), x) + Integral(a**6*x**5/sqrt(
atan(a*x)), x))
```

3.926 $\int \frac{x^m}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{(a^2cx^2+c)\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^m}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{x^m}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.64, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]), x]
```

fricas [A] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{(a^2cx^2+c)\sqrt{\arctan(ax)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/((a^2*c*x^2 + c)*sqrt(arctan(a*x))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.95, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right) \sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\sqrt{\mathrm{atan}\left(a\, x\right)}\, \left(c\, a^2\, x^2 + c\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^m}{a^2 x^2 \sqrt{\mathrm{atan}\,(ax)} + \sqrt{\mathrm{atan}\,(ax)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**m/(a**2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c
```

3.927 $\int \frac{x}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=37

$$\frac{2x\sqrt{\tan^{-1}(ax)}}{ac}-\frac{2\text{Int}\left(\sqrt{\tan^{-1}(ax)},x\right)}{ac}$$

```
[Out] 2*x*arctan(a*x)^(1/2)/a/c-2*Unintegrable(arctan(a*x)^(1/2),x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
[Out] (2*x*Sqrt[ArcTan[a*x]])/(a*c) - (2*Defer[Int][Sqrt[ArcTan[a*x]], x])/(a*c)
```

Rubi steps

$$\int \frac{x}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx=\frac{2x\sqrt{\tan^{-1}(ax)}}{ac}-\frac{2\int\sqrt{\tan^{-1}(ax)}\,dx}{ac}$$

Mathematica [A] time = 0.89, size = 0, normalized size = 0.00

$$\int \frac{x}{(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.35, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c \,x^{2}+c \right) \sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
[Out] int(x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)),x)
[Out] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{2} x^{2} \sqrt{\operatorname{atan}{\left(a x \right)}} + \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)/atan(a*x)**(1/2),x)
[Out] Integral(x/(a**2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c
```

3.928 $\int \frac{1}{\left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=16

$$\frac{2\sqrt{\tan^{-1}(ax)}}{ac}$$

```
[Out] 2*arctan(a*x)^(1/2)/a/c
```

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4884}

$$\frac{2\sqrt{\tan^{-1}(ax)}}{ac}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (2*Sqrt[ArcTan[a*x]])/(a*c)
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}}\,dx = \frac{2\sqrt{\tan^{-1}(ax)}}{ac}$$

Mathematica [A] time = 0.00, size = 16, normalized size = 1.00

$$\frac{2\sqrt{\tan^{-1}(ax)}}{ac}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (2*Sqrt[ArcTan[a*x]])/(a*c)
```

fricas [A] time = 0.43, size = 14, normalized size = 0.88

$$\frac{2\sqrt{\arctan(ax)}}{ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] 2*sqrt(arctan(a*x))/(a*c)
```

giac [A] time = 0.14, size = 14, normalized size = 0.88

$$\frac{2\sqrt{\arctan(ax)}}{ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] 2*sqrt(arctan(a*x))/(a*c)
```

maple [A] time = 0.12, size = 15, normalized size = 0.94

$$\frac{2\sqrt{\arctan\left(ax\right)}}{ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

```
[Out] 2*arctan(a*x)^(1/2)/a/c
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 0.34, size = 14, normalized size = 0.88

$$\frac{2\,\sqrt{\mathrm{atan}\left(a\,x\right)}}{a\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)),x)
```

```
[Out] (2*atan(a*x)^(1/2))/(a*c)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} \frac{2\sqrt{\operatorname{atan}{\left(ax \right)}}}{ac} & \text{for}\: c \neq 0 \\ \tilde{\infty} \int \frac{1}{\sqrt{\operatorname{atan}{\left(ax \right)}}}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)/atan(a*x)**(1/2),x)
```

```
[Out] Piecewise((2*sqrt(atan(a*x))/(a*c), Ne(c, 0)), (zoo*Integral(1/sqrt(atan(a*
x)), x), True))
```

3.929 $\int \frac{1}{x(c+a^2cx^2)\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][1/(x*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.27, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(a^{2} c \,x^{2}+c \right) \sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2} x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}} + x \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(a**2*x**3*sqrt(atan(a*x)) + x*sqrt(atan(a*x))), x)/c
```

3.930 $\int \frac{x^m}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.51, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(arctan(a*x))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.22, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c\,x^{2}+c\right)^{2} \sqrt{\arctan\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^{m}}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^{2}\,x^{2}+c\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{4}x^{4}\sqrt{\mathrm{atan}\,(ax)}+2a^{2}x^{2}\sqrt{\mathrm{atan}\,(ax)}+\sqrt{\mathrm{atan}\,(ax)}}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**m/(a**4*x**4*sqrt(atan(a*x)) + 2*a**2*x**2*sqrt(atan(a*x)) + sq
rt(atan(a*x))), x)/c**2
```

3.931 $\int \frac{x^3}{(c+a^2cx^2)^2\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\operatorname{Int}\left(\frac{x^3}{\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^3/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^3}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 3.67, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.36, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c\, x^2 + c\right)^2 \sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^3}{\sqrt{\mathrm{atan}\left(a\, x\right)}\, \left(c\, a^2\, x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^3/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^4 x^4 \sqrt{\mathrm{atan}\left(a x\right)} + 2 a^2 x^2 \sqrt{\mathrm{atan}\left(a x\right)} + \sqrt{\mathrm{atan}\left(a x\right)}}\, dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**3/(a**4*x**4*sqrt(atan(a*x)) + 2*a**2*x**2*sqrt(atan(a*x)) + sq
rt(atan(a*x))), x)/c**2
```

3.932 $\int \frac{x^2}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=47

$$\frac{\sqrt{\tan^{-1}(ax)}}{a^3c^2}-\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^3c^2}$$

```
[Out] -1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^3/c^2+arctan(a*x)^(1
/2)/a^3/c^2
```

Rubi [A] time = 0.11, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4970, 3312, 3304, 3352}

$$\frac{\sqrt{\tan^{-1}(ax)}}{a^3c^2}-\frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^3c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] Sqrt[ArcTan[a*x]]/(a^3*c^2) - (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt
[Pi]])/(2*a^3*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx=\frac{\text{Subst}\left(\int\frac{\sin^2(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^3c^2}$$
$$=\frac{\text{Subst}\left(\int\left(\frac{1}{2\sqrt{x}}-\frac{\cos(2x)}{2\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{a^3c^2}$$
$$=\frac{\sqrt{\tan^{-1}(ax)}}{a^3c^2}-\frac{\text{Subst}\left(\int\frac{\cos(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{2a^3c^2}$$
$$=\frac{\sqrt{\tan^{-1}(ax)}}{a^3c^2}-\frac{\text{Subst}\left(\int\cos\left(2x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2}$$
$$=\frac{\sqrt{\tan^{-1}(ax)}}{a^3c^2}-\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^3c^2}$$

Mathematica [C] time = 0.22, size = 122, normalized size = 2.60

$$\frac{-4\sqrt{\pi}\sqrt{\tan^{-1}(ax)}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+16\tan^{-1}(ax)+i\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)-i\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma}{16a^3c^2\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (16*ArcTan[a*x] - 4*Sqrt[Pi]*Sqrt[ArcTan[a*x]]*FresnelC[(2*Sqrt[ArcTan[a*x]
])/Sqrt[Pi]] + I*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*
x]] - I*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]])/(16*a^3*
c^2*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.43, size = 38, normalized size = 0.81

$$-\frac{\text{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{2a^3c^2}+\frac{\sqrt{\arctan(ax)}}{a^3c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] -1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^3/c^2+arctan(a*x)^(1
/2)/a^3/c^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^2}{\sqrt{\operatorname{atan}(a\,x)}\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^4x^4\sqrt{\operatorname{atan}(ax)}+2a^2x^2\sqrt{\operatorname{atan}(ax)}+\sqrt{\operatorname{atan}(ax)}}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**2/(a**4*x**4*sqrt(atan(a*x)) + 2*a**2*x**2*sqrt(atan(a*x)) + sq
rt(atan(a*x))), x)/c**2
```

3.933 $\int \frac{x}{(c+a^2cx^2)^2\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=31

$$\frac{\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^2c^2}$$

```
[Out] 1/2*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^2
```

Rubi [A] time = 0.07, antiderivative size = 31, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.227, Rules used = {4970, 4406, 12, 3305, 3351}

$$\frac{\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(2*a^2*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\text{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^2}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^2}$$
$$= \frac{\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{2a^2c^2}$$
$$= \frac{\text{Subst}\left(\int \sin\left(2x^2\right)\,dx, x, \sqrt{\tan^{-1}(ax)}\right)}{a^2c^2}$$
$$= \frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^2c^2}$$

Mathematica [A] time = 0.05, size = 31, normalized size = 1.00

$$\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
[Out] (Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(2*a^2*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.17, size = 24, normalized size = 0.77

$$\frac{\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{2a^2c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] 1/2*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{\sqrt{\operatorname{atan}(a\,x)}\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^4x^4\sqrt{\operatorname{atan}(ax)}+2a^2x^2\sqrt{\operatorname{atan}(ax)}+\sqrt{\operatorname{atan}(ax)}}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x/(a**4*x**4*sqrt(atan(a*x)) + 2*a**2*x**2*sqrt(atan(a*x)) + sqrt(
atan(a*x))), x)/c**2
```

3.934 $\int \frac{1}{\left(c+a^2cx^2\right)^2 \sqrt{\tan^{-1}(ax)}} \, dx$

Optimal. Leaf size=47

$$\frac{\sqrt{\pi}\, C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2ac^2}+\frac{\sqrt{\tan^{-1}(ax)}}{ac^2}$$

```
[Out] 1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^2+arctan(a*x)^(1/2)
/a/c^2
```

Rubi [A] time = 0.07, antiderivative size = 47, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4904, 3312, 3304, 3352}

$$\frac{\sqrt{\pi}\, \text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2ac^2}+\frac{\sqrt{\tan^{-1}(ax)}}{ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] Sqrt[ArcTan[a*x]]/(a*c^2) + (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[P
i]])/(2*a*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{ac^2}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{2\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{ac^2}$$
$$= \frac{\sqrt{\tan^{-1}(ax)}}{ac^2} + \frac{\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{2ac^2}$$
$$= \frac{\sqrt{\tan^{-1}(ax)}}{ac^2} + \frac{\text{Subst}\left(\int \cos\left(2x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{ac^2}$$
$$= \frac{\sqrt{\tan^{-1}(ax)}}{ac^2} + \frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2ac^2}$$

Mathematica [A] time = 0.12, size = 43, normalized size = 0.91

$$\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+2\sqrt{\tan^{-1}(ax)}}{2ac^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (2*Sqrt[ArcTan[a*x]] + Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(
2*a*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.45, size = 38, normalized size = 0.81

$$\frac{\text{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{2a\,c^2}+\frac{\sqrt{\arctan\left(ax\right)}}{a\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] 1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^2+arctan(a*x)^(1/2)
/a/c^2
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4}x^{4}\sqrt{\operatorname{atan}{\left(ax \right)}}+2a^{2}x^{2}\sqrt{\operatorname{atan}{\left(ax \right)}}+\sqrt{\operatorname{atan}{\left(ax \right)}}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(a**4*x**4*sqrt(atan(a*x)) + 2*a**2*x**2*sqrt(atan(a*x)) + sqrt(
atan(a*x))), x)/c**2
```

3.935 $\int \frac{1}{x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.46, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.43, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2} c\,x^{2}+c\right)^{2} \sqrt{\arctan \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{5} \sqrt{\operatorname{atan}{\left(a x \right)}} + 2 a^{2} x^{3} \sqrt{\operatorname{atan}{\left(a x \right)}} + x \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**2/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(a**4*x**5*sqrt(atan(a*x)) + 2*a**2*x**3*sqrt(atan(a*x)) + x*sqr
t(atan(a*x))), x)/c**2
```

3.936 $\int \frac{x^m}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.98, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*sqrt(arct
an(a*x))), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

[Out] Timed out

maple [A] time = 3.34, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{3} \sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.937 $\int \frac{x^5}{(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{x^5}{(a^2cx^2+c)^3\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^5/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^5}{(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^5/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] Defer[Int][x^5/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^5}{(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{x^5}{(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 4.47, size = 0, normalized size = 0.00

$$\int \frac{x^5}{(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^5/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] Integrate[x^5/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.70, size = 0, normalized size = 0.00

$$\int \frac{x^5}{\left(a^2 c\, x^2 + c\right)^3 \sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^5/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^5}{\sqrt{\mathrm{atan}\left(a\, x\right)}\, \left(c\, a^2\, x^2 + c\right)^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^5/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^5}{a^6 x^6 \sqrt{\operatorname{atan}{\left(a x \right)}} + 3 a^4 x^4 \sqrt{\operatorname{atan}{\left(a x \right)}} + 3 a^2 x^2 \sqrt{\operatorname{atan}{\left(a x \right)}} + \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**5/(a**6*x**6*sqrt(atan(a*x)) + 3*a**4*x**4*sqrt(atan(a*x)) + 3*
a**2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c**3
```

3.938 $\int \frac{x^4}{(c+a^2cx^2)^3 \sqrt{\tan^{-1}(ax)}} dx$

Optimal. Leaf size=89

$$\frac{\sqrt{\frac{\pi}{2}}\, C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^5c^3} - \frac{\sqrt{\pi}\, C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^5c^3} + \frac{3\sqrt{\tan^{-1}(ax)}}{4a^5c^3}$$

```
[Out] 1/16*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^5/c^
3-1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^5/c^3+3/4*arctan(a*
x)^(1/2)/a^5/c^3
```

Rubi [A] time = 0.14, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4970, 3312, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}\, \text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^5c^3} - \frac{\sqrt{\pi}\, \text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^5c^3} + \frac{3\sqrt{\tan^{-1}(ax)}}{4a^5c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^4/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (3*Sqrt[ArcTan[a*x]])/(4*a^5*c^3) + (Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[
ArcTan[a*x]]])/(8*a^5*c^3) - (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[
Pi]])/(2*a^5*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\text{Subst}\left(\int \frac{\sin^4(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^5c^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}-\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{a^5c^3}$$
$$= \frac{3\sqrt{\tan^{-1}(ax)}}{4a^5c^3}+\frac{\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{8a^5c^3}-\frac{\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx, x, \text{t}\right.}{2a^5c^3}$$
$$= \frac{3\sqrt{\tan^{-1}(ax)}}{4a^5c^3}+\frac{\text{Subst}\left(\int \cos\left(4x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{4a^5c^3}-\frac{\text{Subst}\left(\int \cos\left(2x\right.\right.}{}$$
$$= \frac{3\sqrt{\tan^{-1}(ax)}}{4a^5c^3}+\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^5c^3}-\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2a^5c^3}$$

Mathematica [C] time = 0.53, size = 230, normalized size = 2.58

$$\frac{10\sqrt{2\pi}\sqrt{\tan^{-1}(ax)^2}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-80\sqrt{\pi}\sqrt{\tan^{-1}(ax)^2}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+3\sqrt{\tan^{-1}(ax)}\left(64\sqrt{\tan^{-1}(a\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (10*Sqrt[2*Pi]*Sqrt[ArcTan[a*x]^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]]
 - 80*Sqrt[Pi]*Sqrt[ArcTan[a*x]^2]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]]
 + 3*Sqrt[ArcTan[a*x]]*(64*Sqrt[ArcTan[a*x]^2] + 4*Sqrt[2]*Sqrt[I*ArcTan[a*
x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] + 4*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma
[1/2, (2*I)*ArcTan[a*x]] - Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x
]] - Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]]))/(256*a^5*c^3*Sq
rt[ArcTan[a*x]^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.56, size = 68, normalized size = 0.76

$$\frac{\text{FresnelC}\left(\frac{2\sqrt{2}\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{2}\sqrt{\pi}}{16a^5c^3}-\frac{\text{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{2a^5c^3}+\frac{3\sqrt{\arctan\left(ax\right)}}{4a^5c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] 1/16*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^5/c^
3-1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^5/c^3+3/4*arctan(a*
x)^(1/2)/a^5/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4}{\sqrt{\operatorname{atan}(a\,x)}\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^4/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4}{a^6x^6\sqrt{\operatorname{atan}(ax)}+3a^4x^4\sqrt{\operatorname{atan}(ax)}+3a^2x^2\sqrt{\operatorname{atan}(ax)}+\sqrt{\operatorname{atan}(ax)}}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**4/(a**6*x**6*sqrt(atan(a*x)) + 3*a**4*x**4*sqrt(atan(a*x)) + 3*
a**2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c**3
```

3.939 $\int \frac{x^3}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=71

$$\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{4a^4c^3}-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^4c^3}$$

```
[Out] -1/16*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^4/c
^3+1/4*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^3
```

Rubi [A] time = 0.13, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4970, 4406, 3305, 3351}

$$\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{4a^4c^3}-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^4c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] -(Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(8*a^4*c^3) + (Sqrt[
Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(4*a^4*c^3)
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx=\frac{\text{Subst}\left(\int \frac{\cos(x)\sin^3(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^4c^3}$$
$$=\frac{\text{Subst}\left(\int \left(\frac{\sin(2x)}{4\sqrt{x}}-\frac{\sin(4x)}{8\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{a^4c^3}$$
$$=-\frac{\text{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8a^4c^3}+\frac{\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^4c^3}$$
$$=-\frac{\text{Subst}\left(\int \sin\left(4x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{4a^4c^3}+\frac{\text{Subst}\left(\int \sin\left(2x^2\right)dx,x,\sqrt{\tan^{-1}(a\right.}}{2a^4c^3}$$
$$=-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^4c^3}+\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{4a^4c^3}$$

Mathematica [C] time = 0.15, size = 131, normalized size = 1.85

$$\frac{-2\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)-2\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)+\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}\right.}{32a^4c^3\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (-2*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] - 2*Sqrt[
2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] + Sqrt[(-I)*ArcTan[a*x
]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*Ar
cTan[a*x]])/(32*a^4*c^3*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.41, size = 54, normalized size = 0.76

$$-\frac{\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{2}\,\sqrt{\pi}}{16a^4c^3}+\frac{\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{4a^4c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] -1/16*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^4/c
^3+1/4*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^3/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3}}{a^{6} x^{6} \sqrt{\operatorname{atan}{\left(a x \right)}} + 3 a^{4} x^{4} \sqrt{\operatorname{atan}{\left(a x \right)}} + 3 a^{2} x^{2} \sqrt{\operatorname{atan}{\left(a x \right)}} + \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**3/(a**6*x**6*sqrt(atan(a*x)) + 3*a**4*x**4*sqrt(atan(a*x)) + 3*
a**2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c**3
```

3.940 $\int \frac{x^2}{(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}dx$

Optimal. Leaf size=58

$$\frac{\sqrt{\tan^{-1}(ax)}}{4a^3c^3}-\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^3c^3}$$

```
[Out] -1/16*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^3/c
^3+1/4*arctan(a*x)^(1/2)/a^3/c^3
```

Rubi [A] time = 0.12, antiderivative size = 58, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4970, 4406, 3304, 3352}

$$\frac{\sqrt{\tan^{-1}(ax)}}{4a^3c^3}-\frac{\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] Sqrt[ArcTan[a*x]]/(4*a^3*c^3) - (Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcT
an[a*x]]])/(8*a^3*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^2(x)\sin^2(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^3c^3}$$
$$= \frac{\text{Subst}\left(\int \left(\frac{1}{8\sqrt{x}}-\frac{\cos(4x)}{8\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{a^3c^3}$$
$$= \frac{\sqrt{\tan^{-1}(ax)}}{4a^3c^3}-\frac{\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8a^3c^3}$$
$$= \frac{\sqrt{\tan^{-1}(ax)}}{4a^3c^3}-\frac{\text{Subst}\left(\int \cos\left(4x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{4a^3c^3}$$
$$= \frac{\sqrt{\tan^{-1}(ax)}}{4a^3c^3}-\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^3c^3}$$

Mathematica [C] time = 0.48, size = 229, normalized size = 3.95

$$-2\sqrt{2\pi}\sqrt{\tan^{-1}(ax)^2}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+16\sqrt{\pi}\sqrt{\tan^{-1}(ax)^2}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+\sqrt{\tan^{-1}(ax)}\left(64\sqrt{\tan^{-1}(ax\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (-2*Sqrt[2*Pi]*Sqrt[ArcTan[a*x]^2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]]
 + 16*Sqrt[Pi]*Sqrt[ArcTan[a*x]^2]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]]
 + Sqrt[ArcTan[a*x]]*(64*Sqrt[ArcTan[a*x]^2] + 4*Sqrt[2]*Sqrt[I*ArcTan[a*x]
]*Gamma[1/2, (-2*I)*ArcTan[a*x]] + 4*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1
/2, (2*I)*ArcTan[a*x]] + 7*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x
]] + 7*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]]))/(256*a^3*c^3*
Sqrt[ArcTan[a*x]^2])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.50, size = 45, normalized size = 0.78

$$-\frac{\text{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{2}\,\sqrt{\pi}}{16a^3c^3}+\frac{\sqrt{\arctan\left(ax\right)}}{4a^3c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] -1/16*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^3/c
^3+1/4*arctan(a*x)^(1/2)/a^3/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^2}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^6x^6\sqrt{\mathrm{atan}\,(ax)}+3a^4x^4\sqrt{\mathrm{atan}\,(ax)}+3a^2x^2\sqrt{\mathrm{atan}\,(ax)}+\sqrt{\mathrm{atan}\,(ax)}}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**2/(a**6*x**6*sqrt(atan(a*x)) + 3*a**4*x**4*sqrt(atan(a*x)) + 3*
a**2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c**3
```

3.941 $\int \frac{x}{(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=71

$$\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^2c^3}+\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{4a^2c^3}$$

```
[Out] 1/16*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^2/c^
3+1/4*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^3
```

Rubi [A] time = 0.11, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.182, Rules used = {4970, 4406, 3305, 3351}

$$\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^2c^3}+\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{4a^2c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[Pi/2]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(8*a^2*c^3) + (Sqrt[P
i]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(4*a^2*c^3)
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx=\frac{\text{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^2c^3}$$
$$=\frac{\text{Subst}\left(\int \left(\frac{\sin(2x)}{4\sqrt{x}}+\frac{\sin(4x)}{8\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{a^2c^3}$$
$$=\frac{\text{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{8a^2c^3}+\frac{\text{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^2c^3}$$
$$=\frac{\text{Subst}\left(\int \sin\left(4x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{4a^2c^3}+\frac{\text{Subst}\left(\int \sin\left(2x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{2a^2c^3}$$
$$=\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8a^2c^3}+\frac{\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{4a^2c^3}$$

Mathematica [C] time = 0.11, size = 133, normalized size = 1.87

$$\frac{-2\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)-2\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)-\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}(ax)\right)\ldots}{32a^2c^3\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (-2*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*ArcTan[a*x]] - 2*Sqrt[
2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] - Sqrt[(-I)*ArcTan[a*x
]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] - Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*Ar
cTan[a*x]])/(32*a^2*c^3*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.34, size = 54, normalized size = 0.76

$$\frac{\mathrm{S}\left(\frac{2\sqrt{2}\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{2}\sqrt{\pi}}{16a^2c^3}+\frac{\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{4a^2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] 1/16*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^2/c^
3+1/4*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\sqrt{\operatorname{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{6}x^{6}\sqrt{\operatorname{atan}{\left(ax \right)}}+3a^{4}x^{4}\sqrt{\operatorname{atan}{\left(ax \right)}}+3a^{2}x^{2}\sqrt{\operatorname{atan}{\left(ax \right)}}+\sqrt{\operatorname{atan}{\left(ax \right)}}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x/(a**6*x**6*sqrt(atan(a*x)) + 3*a**4*x**4*sqrt(atan(a*x)) + 3*a**
2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c**3
```

3.942 $\int \frac{1}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=89

$$\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8ac^3}+\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2ac^3}+\frac{3\sqrt{\tan^{-1}(ax)}}{4ac^3}$$

```
[Out] 1/16*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a/c^3+
1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^3+3/4*arctan(a*x)^(
1/2)/a/c^3
```

Rubi [A] time = 0.10, antiderivative size = 89, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4904, 3312, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8ac^3}+\frac{\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2ac^3}+\frac{3\sqrt{\tan^{-1}(ax)}}{4ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (3*Sqrt[ArcTan[a*x]])/(4*a*c^3) + (Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[Ar
cTan[a*x]]])/(8*a*c^3) + (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]]
)/(2*a*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{ac^3}$$

$$= \frac{\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{ac^3}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{4ac^3} + \frac{\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{8ac^3} + \frac{\text{Subst}\left(\int \frac{\cos(2x)}{\sqrt{x}}\,dx, x, \text{t}\right.}{2ac^3}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{4ac^3} + \frac{\text{Subst}\left(\int \cos\left(4x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{4ac^3} + \frac{\text{Subst}\left(\int \cos\left(2x\right.\right.}{}$$

$$= \frac{3\sqrt{\tan^{-1}(ax)}}{4ac^3} + \frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{8ac^3} + \frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{2ac^3}$$

Mathematica [C] time = 0.28, size = 147, normalized size = 1.65

$$\frac{24\tan^{-1}(ax) - 4i\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2}, -2i\tan^{-1}(ax)\right) + 4i\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2}, 2i\tan^{-1}(ax)\right) - i\sqrt{-i\tan^{-1}(}{32ac^3\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (24*ArcTan[a*x] - (4*I)*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*Ar
cTan[a*x]] + (4*I)*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]
] - I*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + I*Sqrt[I*ArcT
an[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/(32*a*c^3*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.54, size = 68, normalized size = 0.76

$$\frac{\text{FresnelC}\left(\frac{2\sqrt{2}\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{2}\sqrt{\pi}}{16a\,c^3} + \frac{\text{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\sqrt{\pi}}{2a\,c^3} + \frac{3\sqrt{\arctan(ax)}}{4a\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] 1/16*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a/c^3+
1/2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^3+3/4*arctan(a*x)^(
1/2)/a/c^3
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\sqrt{\operatorname{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{6} \sqrt{\operatorname{atan}{\left(a x \right)}} + 3 a^{4} x^{4} \sqrt{\operatorname{atan}{\left(a x \right)}} + 3 a^{2} x^{2} \sqrt{\operatorname{atan}{\left(a x \right)}} + \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(a**6*x**6*sqrt(atan(a*x)) + 3*a**4*x**4*sqrt(atan(a*x)) + 3*a**
2*x**2*sqrt(atan(a*x)) + sqrt(atan(a*x))), x)/c**3
```

3.943 $\int \frac{1}{x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.80, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.32, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)^{3}\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^{2}\,x^{2}+c\right)^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6}x^{7}\sqrt{\mathrm{atan}\left(ax\right)}+3a^{4}x^{5}\sqrt{\mathrm{atan}\left(ax\right)}+3a^{2}x^{3}\sqrt{\mathrm{atan}\left(ax\right)}+x\sqrt{\mathrm{atan}\left(ax\right)}}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**3/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(a**6*x**7*sqrt(atan(a*x)) + 3*a**4*x**5*sqrt(atan(a*x)) + 3*a**
2*x**3*sqrt(atan(a*x)) + x*sqrt(atan(a*x))), x)/c**3
```

3.944 $\int \frac{x^m \sqrt{c+a^2 c x^2}}{\sqrt{\tan^{-1}(ax)}} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m \sqrt{a^2 c x^2 + c}}{\sqrt{\tan^{-1}(ax)}}, x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.09, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{c + a^2 c x^2}}{\sqrt{\tan^{-1}(ax)}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x^m*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x^m \sqrt{c + a^2 c x^2}}{\sqrt{\tan^{-1}(ax)}} \, dx = \int \frac{x^m \sqrt{c + a^2 c x^2}}{\sqrt{\tan^{-1}(ax)}} \, dx$$

Mathematica [A] time = 0.85, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{c + a^2 c x^2}}{\sqrt{\tan^{-1}(ax)}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2 c x^2 + c}\, x^m}{\sqrt{\arctan(ax)}}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/sqrt(arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.01, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\sqrt{a^{2}c\,x^{2}+c}}{\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\sqrt{c\,a^2\,x^2+c}}{\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(1/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\sqrt{c\left(a^{2}x^{2}+1\right)}}{\sqrt{\operatorname{atan}{\left(ax\right)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))/sqrt(atan(a*x)), x)
```

3.945 $\int \frac{x\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\sqrt{a^2cx^2+c}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(x*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{x\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.95, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(x*Sqrt[c + a^2*c*x^2])/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.71, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{a^{2}c\,x^{2}+c}}{\sqrt{\arctan\left(ax\right)}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
[Out] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\sqrt{c\,a^2\,x^2+c}}{\sqrt{\mathrm{atan}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(1/2),x)
[Out] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c\left(a^{2}x^{2}+1\right)}}{\sqrt{\operatorname{atan}{\left(ax\right)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(1/2)/atan(a*x)**(1/2),x)
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))/sqrt(atan(a*x)), x)
```

3.946 $\int \frac{\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.28, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[Sqrt[c + a^2*c*x^2]/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.52, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2 c\,x^2 + c}}{\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
[Out] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^2\,x^2 + c}}{\sqrt{\mathrm{atan}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^(1/2),x)
[Out] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c\left(a^2x^2 + 1\right)}}{\sqrt{\mathrm{atan}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/atan(a*x)**(1/2),x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/sqrt(atan(a*x)), x)
```

3.947 $\int \frac{\sqrt{c+a^2cx^2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{x\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/(x*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{x\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{\sqrt{c+a^2cx^2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 2.90, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/(x*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.68, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c\,x^{2}+c}}{x\sqrt{\arctan \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(1/2),x)
[Out] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^(1/2)),x)
[Out] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{x \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/x/atan(a*x)**(1/2),x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/(x*sqrt(atan(a*x))), x)
```

3.948 $\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^m}{\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m/sqrt(arctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.89, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c \, x^2 + c\right)^{\frac{3}{2}}}{\sqrt{\arctan \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m \left(c \, a^2 \, x^2 + c\right)^{3/2}}{\sqrt{\mathrm{atan}\left(a \, x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(1/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.949 $\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 3.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x*(c + a^2*c*x^2)^(3/2))/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.69, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}{\sqrt{\arctan\left(a x\right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
[Out] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(1/2),x)
[Out] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{\sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)/sqrt(atan(a*x)), x)
```

3.950 $\int \frac{(c+a^2cx^2)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=26

$$\mathrm{Int}\left(\frac{(a^2cx^2+c)^{3/2}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{(c+a^2cx^2)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.39, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{3/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/Sqrt[ArcTan[a*x]],x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 1.37, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\, x^2 + c\right)^{\frac{3}{2}}}{\sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)

[Out] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima: expt: undefined: 0 to a negative exponent.

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\, a^2\, x^2 + c\right)^{3/2}}{\sqrt{\mathrm{atan}\left(a\, x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^(1/2),x)

[Out] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^(1/2), x)

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^2 x^2 + 1\right)\right)^{\frac{3}{2}}}{\sqrt{\operatorname{atan}\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)

[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/sqrt(atan(a*x)), x)

3.951 $\int \frac{(c+a^2cx^2)^{3/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{(a^2cx^2+c)^{3/2}}{x\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{3/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/(x*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{3/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{(c+a^2cx^2)^{3/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 2.50, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{3/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/(x*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [**A**] time = 1.61, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{x \sqrt{\arctan \left(a x \right)}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(1/2),x)
[Out] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(1/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^(1/2)),x)
[Out] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^(1/2)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{x \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/x/atan(a*x)**(1/2),x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/(x*sqrt(atan(a*x))), x)
```

3.952 $\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.41, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]], x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m}{\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m/sqrt(a
rctan(a*x)), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.85, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c\,x^2+c\right)^{\frac{5}{2}}}{\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{\sqrt{\mathrm{atan}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(1/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.953 $\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 2.61, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(x*(c + a^2*c*x^2)^(5/2))/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.86, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{\sqrt{\arctan\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
[Out] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{\sqrt{\mathrm{atan}\left(a\,x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(1/2),x)
[Out] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
[Out] Timed out
```

3.954 $\int \frac{(c+a^2cx^2)^{5/2}}{\sqrt{\tan^{-1}(ax)}} dx$

Optimal. Leaf size=26

$$\mathrm{Int}\left(\frac{(a^2cx^2+c)^{5/2}}{\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{5/2}}{\sqrt{\tan^{-1}(ax)}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/Sqrt[ArcTan[a*x]],x]
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/Sqrt[ArcTan[a*x]], x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{5/2}}{\sqrt{\tan^{-1}(ax)}} dx = \int \frac{(c+a^2cx^2)^{5/2}}{\sqrt{\tan^{-1}(ax)}} dx$$

Mathematica [A] time = 0.44, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{5/2}}{\sqrt{\tan^{-1}(ax)}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/Sqrt[ArcTan[a*x]],x]
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/Sqrt[ArcTan[a*x]], x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.54, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\, x^2 + c\right)^{\frac{5}{2}}}{\sqrt{\arctan\left(ax\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\, a^2\, x^2 + c\right)^{5/2}}{\sqrt{\mathrm{atan}\left(a\, x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^(1/2),x)
```

```
[Out] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^(1/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.955 $\int \frac{(c+a^2cx^2)^{5/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{(a^2cx^2+c)^{5/2}}{x\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/(x*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{(c+a^2cx^2)^{5/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 2.54, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/(x*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/(x*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.64, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{x\sqrt{\arctan\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(1/2),x)
[Out] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^(1/2)),x)
[Out] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}}}{x \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/x/atan(a*x)**(1/2),x)
[Out] Integral((c*(a**2*x**2 + 1))**(5/2)/(x*sqrt(atan(a*x))), x)
```

3.956 $\int \frac{x^m}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^m/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.91, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

fricas [A] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\sqrt{\arctan(ax)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/(sqrt(a^2*c*x^2 + c)*sqrt(arctan(a*x))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.95, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\sqrt{a^{2} c \,x^{2}+c}\, \sqrt{\arctan \left(a x \right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
[Out] int(x^m/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\sqrt{c \left(a^{2} x^{2} + 1\right)} \sqrt{\operatorname{atan}{\left (a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(1/2)/atan(a*x)**(1/2),x)
[Out] Integral(x**m/(sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x))), x)
```

3.957 $\int \frac{x}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=27

$$\mathrm{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx = \int \frac{x}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.15, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.28, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{a^2c\,x^2+c}\,\sqrt{\arctan(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\sqrt{\operatorname{atan}\left(a\,x\right)}\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c\left(a^{2}x^{2}+1\right)}\sqrt{\operatorname{atan}{\left(ax \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(1/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x))), x)
```

3.958 $\int \frac{1}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{1}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 0.23, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[1/(Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.38, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{a^2 c\, x^2 + c}\, \sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\sqrt{\mathrm{atan}\left(a\, x\right)}\, \sqrt{c\, a^2\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c \left(a^2 x^2 + 1\right)}\, \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(1/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x))), x)
```

3.959 $\int \frac{1}{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{x\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][1/(x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{1}{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.03, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.67, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{a^{2}c\,x^{2}+c}\,\sqrt{\arctan\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,\sqrt{c\,a^{2}\,x^{2}+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{c\left(a^{2}x^{2}+1\right)}\,\sqrt{\mathrm{atan}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(1/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(c*(a**2*x**2 + 1))*sqrt(atan(a*x))), x)
```

3.960 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)$$

[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]

[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.03, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(
arctan(a*x))), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 2.96, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right)^{\frac{3}{2}} \sqrt{\arctan \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.961 $\int \frac{x^2}{(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^2}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^2/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 3.49, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 9.87, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2 c\, x^2 + c\right)^{\frac{3}{2}} \sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^2}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(3/2)*sqrt(atan(a*x))), x)
```

3.962 $\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=60

$$\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{a^2cx^2+c}}$$

```
[Out] FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(
1/2)/a^2/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.16, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.167, Rules used = {4971, 4970, 3305, 3351}

$$\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*
c*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x}{\left(1+a^2x^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^2c\sqrt{c+a^2cx^2}}$$

$$= \frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \sin\left(x^2\right)\,dx, x, \sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{2\pi}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.14, size = 97, normalized size = 1.62

$$-\frac{\sqrt{a^2x^2+1}\left(\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)\right)}{2a^2c\sqrt{c\left(a^2x^2+1\right)}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] -1/2*(Sqrt[1 + a^2*x^2]*(Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]
] + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]]))/(a^2*c*Sqrt[c*(1 + a^2*
x^2)]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 3.26, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{\sqrt{\operatorname{atan}(a\,x)}\,\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\sqrt{\operatorname{atan}(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x/((c*(a**2*x**2 + 1))**(3/2)*sqrt(atan(a*x))), x)
```

3.963 $\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=60

$$\frac{\sqrt{2\pi}\,\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\,\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{a^2cx^2+c}}$$

```
[Out] FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(
1/2)/a/c/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.174, Rules used = {4905, 4904, 3304, 3352}

$$\frac{\sqrt{2\pi}\,\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\,\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a*c*
Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx=\frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c\sqrt{c+a^2cx^2}}$$
$$=\frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\cos(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{ac\sqrt{c+a^2cx^2}}$$
$$=\frac{\left(2\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \cos\left(x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{c+a^2cx^2}}$$
$$=\frac{\sqrt{2\pi}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.05, size = 61, normalized size = 1.02

$$\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{c\left(a^2x^2+1\right)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a*c*
Sqrt[c*(1 + a^2*x^2)])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.46, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\sqrt{\operatorname{atan}(a\,x)}\,\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\sqrt{\operatorname{atan}(ax)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(3/2)*sqrt(atan(a*x))), x)
```

3.964 $\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.94, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.63, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \sqrt{\arctan \left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(3/2)*sqrt(atan(a*x))), x)
```

3.965 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 1.63, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\sqrt{\arctan\left(ax\right)}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*sqrt(arctan(a*x))), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.97, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right)^{\frac{5}{2}} \sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Timed out
```

3.966 $\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^4}{\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)$$

```
[Out] Unintegrable(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^4/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Defer[Int][x^4/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 3.66, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
[Out] Integrate[x^4/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 11.14, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c\,x^2 + c\right)^{\frac{5}{2}} \sqrt{\arctan\left(ax\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^4}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,\left(c\,a^2\,x^2 + c\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^4/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c\left(a^2x^2 + 1\right)\right)^{\frac{5}{2}} \sqrt{\operatorname{atan}\left(ax\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**4/((c*(a**2*x**2 + 1))**(5/2)*sqrt(atan(a*x))), x)
```

3.967 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=131

$$\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -1/12*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^
2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)+3/4*FresnelS(2^(1/2)/Pi^(1/2)*arctan
(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.29, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4971, 4970, 3312, 3305, 3351}

$$\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (3*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(2*
a^4*c^2*Sqrt[c + a^2*c*x^2]) - (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[
6/Pi]*Sqrt[ArcTan[a*x]]])/(2*a^4*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
```

```
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x^3}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\sin^3(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \left(\frac{3\sin(x)}{4\sqrt{x}}-\frac{\sin(3x)}{4\sqrt{x}}\right)dx,x,\tan^{-1}(ax)\right)}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\sin(3x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^4c^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\right.}{4a^4c^2\sqrt{c+a^2c}}$$

$$= -\frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \sin\left(3x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\right.}{2a^4c^2}$$

$$= \frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{\frac{\pi}{6}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^2\sqrt{c+a^2cx^2}}$$

Mathematica [A] time = 0.21, size = 95, normalized size = 0.73

$$\frac{\sqrt{\frac{\pi}{6}}\left(a^2x^2+1\right)^{3/2}\left(3\sqrt{3}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)\right)}{2a^4c\left(c\left(a^2x^2+1\right)\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[Pi/6]*(1 + a^2*x^2)^(3/2)*(3*Sqrt[3]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[
a*x]]] - FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]]))/(2*a^4*c*(c*(1 + a^2*x^2)
)^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 8.79, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c\,x^2+c\right)^{\frac{5}{2}} \sqrt{\arctan\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^3/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c\left(a^2x^2+1\right)\right)^{\frac{5}{2}} \sqrt{\operatorname{atan}\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(5/2)*sqrt(atan(a*x))), x)
```

3.968 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=131

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^3c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^3c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -1/12*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^
2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)+1/4*FresnelC(2^(1/2)/Pi^(1/2)*arctan
(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.30, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.192, Rules used = {4971, 4970, 4406, 3304, 3352}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^3c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^3c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(2*a^
3*c^2*Sqrt[c + a^2*c*x^2]) - (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/
Pi]*Sqrt[ArcTan[a*x]]])/(2*a^3*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
```

```
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x^2}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^3c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \left(\frac{\cos(x)}{4\sqrt{x}}-\frac{\cos(3x)}{4\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{a^3c^2\sqrt{c+a^2cx^2}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{4a^3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(3x)}{\sqrt{x}}\,d\right.}{4a^3c^2\sqrt{c+a^2c}}$$

$$= \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \cos\left(x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{2a^3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int c\right.}{2a^3c^2}$$

$$= \frac{\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^3c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{\frac{\pi}{6}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^3c^2\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.20, size = 159, normalized size = 1.21

$$-\frac{i\sqrt{a^2x^2+1}\left(3\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)-3\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+\sqrt{3}\left(\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},\right.\right.\right.}{24a^3c^2\sqrt{c\left(a^2x^2+1\right)}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] ((-1/24*I)*Sqrt[1 + a^2*x^2]*(3*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcT
an[a*x]] - 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(-(Sqr
t[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]]) + Sqrt[I*ArcTan[a*x]]*G
amma[1/2, (3*I)*ArcTan[a*x]])))/(a^3*c^2*Sqrt[c*(1 + a^2*x^2)]*Sqrt[ArcTan[
a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 9.92, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2 c\,x^2+c\right)^{\frac{5}{2}} \sqrt{\arctan\left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(5/2)*sqrt(atan(a*x))), x)
```

3.969 $\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=131

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/12*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)+1/4*FresnelS(2^(1/2)/Pi^(1/2)*arctan(
a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4971, 4970, 4406, 3305, 3351}

$$\frac{\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(2*a^
2*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/
Pi]*Sqrt[ArcTan[a*x]]])/(2*a^2*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
```

```
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{x}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \left(\frac{\sin(x)}{4\sqrt{x}}+\frac{\sin(3x)}{4\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{a^2c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{4a^2c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\sin(3x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{4a^2c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \sin\left(x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \sin\left(3x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{\frac{\pi}{6}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2a^2c^2\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.22, size = 156, normalized size = 1.19

$$-\frac{\left(a^2x^2+1\right)^{3/2}\left(3\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+3\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+\sqrt{3}\left(\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},\right.\right.\right.}{24a^2c\left(c\left(a^2x^2+1\right)\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] -1/24*((1 + a^2*x^2)^(3/2)*(3*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan
[a*x]] + 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(Sqrt[(-
I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[
1/2, (3*I)*ArcTan[a*x]])))/(a^2*c*(c*(1 + a^2*x^2))^(3/2)*Sqrt[ArcTan[a*x]]
)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 3.26, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \sqrt{\arctan \left(a x\right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(x/((c*(a**2*x**2 + 1))**(5/2)*sqrt(atan(a*x))), x)
```

3.970 $\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=131

$$\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/12*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)+3/4*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*
x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)
```

Rubi [A] time = 0.15, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4905, 4904, 3312, 3304, 3352}

$$\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{\pi}{6}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac^2\sqrt{a^2cx^2+c}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] (3*Sqrt[Pi/2]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(2*
a*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/
Pi]*Sqrt[ArcTan[a*x]]])/(2*a*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx = \frac{\sqrt{1+a^2x^2}\int \frac{1}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\cos^3(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{ac^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \left(\frac{3\cos(x)}{4\sqrt{x}}+\frac{\cos(3x)}{4\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{ac^2\sqrt{c+a^2cx^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \frac{\cos(3x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{4ac^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \frac{\cos}{\sqrt{}}\right.}{4ac^2\sqrt{c+a^2}}$$
$$= \frac{\sqrt{1+a^2x^2}\,\mathrm{Subst}\left(\int \cos\left(3x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{2ac^2\sqrt{c+a^2cx^2}} + \frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}}{2a}$$
$$= \frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{2ac^2\sqrt{c+a^2cx^2}} + \frac{\sqrt{\frac{\pi}{6}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right.}{2ac^2\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.23, size = 159, normalized size = 1.21

$$-\frac{i\sqrt{c\left(a^2x^2+1\right)}\left(9\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)-9\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+\sqrt{3}\left(\sqrt{-i\tan^{-1}(ax)}\right.\right.}{24ac^3\sqrt{a^2x^2+1}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]
```

```
[Out] ((-1/24*I)*Sqrt[c*(1 + a^2*x^2)]*(9*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*
ArcTan[a*x]] - 9*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(S
qrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] - Sqrt[I*ArcTan[a*x]]*
Gamma[1/2, (3*I)*ArcTan[a*x]])))/(a*c^3*Sqrt[1 + a^2*x^2]*Sqrt[ArcTan[a*x]]
)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \sqrt{\arctan\left(a x\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{5}{2}} \sqrt{\operatorname{atan}{\left(a x \right)}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(5/2)*sqrt(atan(a*x))), x)
```

3.971 $\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)$$

[Out] Unintegrable(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/(x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]

[Out] Defer[Int][1/(x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx=\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Mathematica [A] time = 2.16, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]),x]

[Out] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ rate: implementation incomplete (constant residues)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="giac")

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.67, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}\sqrt{\arctan\left(ax\right)}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x\,\sqrt{\mathrm{atan}\left(a\,x\right)}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(1/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c\left(a^{2}x^{2}+1\right)\right)^{\frac{5}{2}}\sqrt{\operatorname{atan}{\left(ax \right)}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(1/2),x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(5/2)*sqrt(atan(a*x))), x)
```

3.972 $\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 2.15, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)x^m}{\arctan(ax)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((a^2*c*x^2 + c)*x^m/arctan(a*x)^(3/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.04, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)}{\arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2))/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x^{m}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{2} x^{m}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)/atan(a*x)**(3/2),x)
```

```
[Out] c*(Integral(x**m/atan(a*x)**(3/2), x) + Integral(a**2*x**2*x**m/atan(a*x)**
(3/2), x))
```

3.973 $\int \frac{x(c+a^2cx^2)}{\tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}} \, dx = \int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}} \, dx$$

Mathematica [A] time = 1.66, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.74, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2}c\,x^{2}+c\right)}{\arctan\left(ax\right)^{\frac{3}{2}}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2))/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{x}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{2} x^{3}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)/atan(a*x)**(3/2),x)
```

```
[Out] c*(Integral(x/atan(a*x)**(3/2), x) + Integral(a**2*x**3/atan(a*x)**(3/2), x
))
```

3.974 $\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{3/2}} dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{a^2cx^2+c}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{3/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(c + a^2*c*x^2)/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{3/2}} dx = \int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{3/2}} dx$$

Mathematica [A] time = 1.55, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{3/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.43, size = 0, normalized size = 0.00

$$\int \frac{a^{2} c\,x^{2}+c}{\arctan \left(a x\right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{c\,a^2\,x^2+c}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/atan(a*x)^(3/2),x)
```

```
[Out] int((c + a^2*c*x^2)/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{a^{2} x^{2}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{1}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/atan(a*x)**(3/2),x)
```

```
[Out] c*(Integral(a**2*x**2/atan(a*x)**(3/2), x) + Integral(atan(a*x)**(-3/2), x)
)
```

3.975 $\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{a^2cx^2+c}{x\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/x/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/(x*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)/(x*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 2.09, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.81, size = 0, normalized size = 0.00

$$\int \frac{a^{2} c\, x^{2}+c}{x \arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/x/arctan(a*x)^(3/2),x)
[Out] int((a^2*c*x^2+c)/x/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{c\,a^2\,x^2+c}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/(x*atan(a*x)^(3/2)),x)
[Out] int((c + a^2*c*x^2)/(x*atan(a*x)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{1}{x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{2} x}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/x/atan(a*x)**(3/2),x)
[Out] c*(Integral(1/(x*atan(a*x)**(3/2)), x) + Integral(a**2*x/atan(a*x)**(3/2),
x))
```

3.976 $\int \frac{x^m(c+a^2cx^2)^2}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^{3/2}},x\right)$$

[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2),x]

[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2), x]

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.50, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2),x]

[Out] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2), x]

fricas [A] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)x^m}{\arctan\left(ax\right)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m/arctan(a*x)^(3/2), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 4.21, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{2}}{\arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^(3/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x^{m}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x^{2} x^{m}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{4} x^{m}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] c**2*(Integral(x**m/atan(a*x)**(3/2), x) + Integral(2*a**2*x**2*x**m/atan(a
*x)**(3/2), x) + Integral(a**4*x**4*x**m/atan(a*x)**(3/2), x))
```

3.977 $\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.79, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.25, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{2}}{\arctan\left(a x\right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^(3/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x^{3}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{5}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] c**2*(Integral(x/atan(a*x)**(3/2), x) + Integral(2*a**2*x**3/atan(a*x)**(3/
2), x) + Integral(a**4*x**5/atan(a*x)**(3/2), x))
```

3.978 $\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{(a^2cx^2+c)^2}{\tan^{-1}(ax)^{3/2}},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)^2/ArcTan[a*x]^(3/2),x]

[Out] Defer[Int][(c + a^2*c*x^2)^2/ArcTan[a*x]^(3/2), x]

Rubi steps

$$\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^{3/2}}\,dx = \int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.63, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^(3/2),x]

[Out] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^(3/2), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")

[Out] Timed out

maple [A] time = 2.09, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{2}}{\arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
[Out] int((a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/atan(a*x)^(3/2),x)
[Out] int((c + a^2*c*x^2)^2/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{2 a^{2} x^{2}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{4}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{1}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
[Out] c**2*(Integral(2*a**2*x**2/atan(a*x)**(3/2), x) + Integral(a**4*x**4/atan(a
*x)**(3/2), x) + Integral(atan(a*x)**(-3/2), x))
```

3.979 $\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{x\tan^{-1}(ax)^{3/2}},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^2/x/arctan(a*x)^(3/2),x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(3/2)),x]

[Out] Defer[Int][(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(3/2)), x]

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 2.20, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(3/2)),x]

[Out] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(3/2)), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(3/2),x, algorithm="giac")

[Out] Timed out

maple [A] time = 2.92, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{2}}{x \arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/x/arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^2/x/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^2}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/(x*atan(a*x)^(3/2)),x)
```

```
[Out] int((c + a^2*c*x^2)^2/(x*atan(a*x)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{1}{x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{3}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/x/atan(a*x)**(3/2),x)
```

```
[Out] c**2*(Integral(1/(x*atan(a*x)**(3/2)), x) + Integral(2*a**2*x/atan(a*x)**(3
/2), x) + Integral(a**4*x**3/atan(a*x)**(3/2), x))
```

3.980 $\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 0.93, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m}{\arctan\left(ax\right)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m/arctan(a*x
)^(3/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.74, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{3}}{\arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^3}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^(3/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.981 $\int \frac{x(c+a^2cx^2)^3}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.82, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.12, size = 0, normalized size = 0.00

$$\int \frac{x \left(a^{2} c \,x^{2}+c \right)^{3}}{\arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^3}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^(3/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{x}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x^{3}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{5}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{7}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] c**3*(Integral(x/atan(a*x)**(3/2), x) + Integral(3*a**2*x**3/atan(a*x)**(3/
2), x) + Integral(3*a**4*x**5/atan(a*x)**(3/2), x) + Integral(a**6*x**7/ata
n(a*x)**(3/2), x))
```

3.982 $\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{(a^2cx^2+c)^3}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(c + a^2*c*x^2)^3/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{3/2}}\,dx = \int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.68, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.58, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3}}{\arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
[Out] int((a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^3}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/atan(a*x)^(3/2),x)
[Out] int((c + a^2*c*x^2)^3/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{3 a^{2} x^{2}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{4}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{6}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{1}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
[Out] c**3*(Integral(3*a**2*x**2/atan(a*x)**(3/2), x) + Integral(3*a**4*x**4/atan
(a*x)**(3/2), x) + Integral(a**6*x**6/atan(a*x)**(3/2), x) + Integral(atan(
a*x)**(-3/2), x))
```

3.983 $\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3}{x\tan^{-1}(ax)^{3/2}},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^3/x/arctan(a*x)^(3/2),x)

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(3/2)),x]

[Out] Defer[Int][(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(3/2)), x]

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 2.25, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(3/2)),x]

[Out] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(3/2)), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(3/2),x, algorithm="giac")

[Out] Timed out

maple [A] time = 3.41, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3}}{x \arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/x/arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^3/x/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^3}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/(x*atan(a*x)^(3/2)),x)
```

```
[Out] int((c + a^2*c*x^2)^3/(x*atan(a*x)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{1}{x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{3}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{5}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/x/atan(a*x)**(3/2),x)
```

```
[Out] c**3*(Integral(1/(x*atan(a*x)**(3/2)), x) + Integral(3*a**2*x/atan(a*x)**(3
/2), x) + Integral(3*a**4*x**3/atan(a*x)**(3/2), x) + Integral(a**6*x**5/at
an(a*x)**(3/2), x))
```

3.984 $\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=46

$$\frac{2m\text{Int}\left(\frac{x^{m-1}}{\sqrt{\tan^{-1}(ax)}},x\right)}{ac}-\frac{2x^m}{ac\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2*x^m/a/c/arctan(a*x)^(1/2)+2*m*Unintegrable(x^(-1+m)/arctan(a*x)^(1/2),x)
/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^m)/(a*c*Sqrt[ArcTan[a*x]]) + (2*m*Defer[Int][x^(-1 + m)/Sqrt[ArcTan[a
*x]], x])/(a*c)
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2x^m}{ac\sqrt{\tan^{-1}(ax)}}+\frac{(2m)\int \frac{x^{-1+m}}{\sqrt{\tan^{-1}(ax)}}\,dx}{ac}$$

Mathematica [A] time = 0.75, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)), x]
```

fricas [A] time = 2.71, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^2cx^2+c\right)\arctan(ax)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^m/((a^2*c*x^2 + c)*arctan(a*x)^(3/2)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.33, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c\, x^{2}+c \right) \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{m}}{a^{2} x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x**m/(a**2*x**2*atan(a*x)**(3/2) + atan(a*x)**(3/2)), x)/c
```

3.985 $\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=37

$$\frac{2\text{Int}\left(\frac{1}{\sqrt{\tan^{-1}(ax)}},x\right)}{ac}-\frac{2x}{ac\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2*x/a/c/arctan(a*x)^(1/2)+2*Unintegrable(1/arctan(a*x)^(1/2),x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x)/(a*c*Sqrt[ArcTan[a*x]]) + (2*Defer[Int][1/Sqrt[ArcTan[a*x]], x])/(a*
c)
```

Rubi steps

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2x}{ac\sqrt{\tan^{-1}(ax)}}+\frac{2\int \frac{1}{\sqrt{\tan^{-1}(ax)}}\,dx}{ac}$$

Mathematica [A] time = 1.13, size = 0, normalized size = 0.00

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.36, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c\,x^{2}+c\right) \arctan \left(a x\right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
[Out] int(x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x}{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)),x)
[Out] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{2} x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)/atan(a*x)**(3/2),x)
[Out] Integral(x/(a**2*x**2*atan(a*x)**(3/2) + atan(a*x)**(3/2)), x)/c
```

3.986 $\int \frac{1}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=16

$$-\frac{2}{ac\sqrt{\tan^{-1}(ax)}}$$

[Out] -2/a/c/arctan(a*x)^(1/2)

Rubi [A] time = 0.02, antiderivative size = 16, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4884}

$$-\frac{2}{ac\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

[In] Int[1/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]

[Out] -2/(a*c*Sqrt[ArcTan[a*x]])

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2}{ac\sqrt{\tan^{-1}(ax)}}$$

Mathematica [A] time = 0.00, size = 16, normalized size = 1.00

$$-\frac{2}{ac\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

[In] Integrate[1/((c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]

[Out] -2/(a*c*Sqrt[ArcTan[a*x]])

fricas [A] time = 0.67, size = 14, normalized size = 0.88

$$-\frac{2}{ac\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] -2/(a*c*sqrt(arctan(a*x)))

giac [A] time = 4.01, size = 14, normalized size = 0.88

$$-\frac{2}{ac\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] -2/(a*c*sqrt(arctan(a*x)))
```

maple [A] time = 0.12, size = 15, normalized size = 0.94

$$-\frac{2}{ac\sqrt{\arctan\left(ax\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

```
[Out] -2/a/c/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 0.33, size = 14, normalized size = 0.88

$$-\frac{2}{a\,c\,\sqrt{\mathrm{atan}\left(a\,x\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)),x)
```

```
[Out] -2/(a*c*atan(a*x)^(1/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{2}{ac\sqrt{\operatorname{atan}{\left(ax \right)}}} & \text{for}\: c \neq 0 \\\tilde{\infty} \int \frac{1}{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}\, dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)/atan(a*x)**(3/2),x)
```

```
[Out] Piecewise((-2/(a*c*sqrt(atan(a*x))), Ne(c, 0)), (zoo*Integral(atan(a*x)**(-
3/2), x), True))
```

3.987 $\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=43

$$-\frac{2\text{Int}\left(\frac{1}{x^2\sqrt{\tan^{-1}(ax)}},x\right)}{ac}-\frac{2}{acx\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c/x/arctan(a*x)^(1/2)-2*Unintegrable(1/x^2/arctan(a*x)^(1/2),x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x*Sqrt[ArcTan[a*x]]) - (2*Defer[Int][1/(x^2*Sqrt[ArcTan[a*x]]), x])
/(a*c)
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{acx\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\sqrt{\tan^{-1}(ax)}}\,dx}{ac}$$

Mathematica [A] time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.43, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)\arctan\left(ax\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{3/2}\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2}x^{3}\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)} + x\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**2*x**3*atan(a*x)**(3/2) + x*atan(a*x)**(3/2)), x)/c
```

3.988 $\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^2 \tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx = \int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx$$

Mathematica [A] time = 1.19, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^(3/2)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.60, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.989 $\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=93

$$4a\text{Int}\left(\frac{x^5}{\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{x^3}{\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2x^4}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2*x^4/a/c^2/(a^2*x^2+1)/arctan(a*x)^(1/2)+8*Unintegrable(x^3/(a^2*c*x^2+c)
^2/arctan(a*x)^(1/2),x)/a+4*a*Unintegrable(x^5/(a^2*c*x^2+c)^2/arctan(a*x)^
(1/2),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^4/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^4)/(a*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + (8*Defer[Int][x^3/((c +
a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/a + 4*a*Defer[Int][x^5/((c + a^2*c*x^2
)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx=-\frac{2x^4}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{8\int \frac{x^3}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}+(4a)\int \frac{}{\left(c+a^2c\right.}$$

Mathematica [A] time = 4.39, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^4/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[x^4/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple **[A]** time = 2.45, size = 0, normalized size = 0.00

$$\int \frac{x^4}{\left(a^2 c\, x^2 + c\right)^2 \arctan\left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
[Out] int(x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima **[F(-2)]** time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad **[A]** time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^4}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
[Out] int(x^4/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy **[A]** time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^4}{a^4 x^4 \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 2 a^2 x^2 \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
[Out] Integral(x**4/(a**4*x**4*atan(a*x)**(3/2) + 2*a**2*x**2*atan(a*x)**(3/2) +
atan(a*x)**(3/2)), x)/c**2
```

3.990 $\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=106

$$2a\text{Int}\left(\frac{x^4}{\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)-\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^4c^2}+\frac{6\sqrt{\tan^{-1}(ax)}}{a^4c^2}-\frac{2x^3}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -3*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^2-2*x^3/a/c^2/(a^2
*x^2+1)/arctan(a*x)^(1/2)+6*arctan(a*x)^(1/2)/a^4/c^2+2*a*Unintegrable(x^4/
(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.25, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^3)/(a*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + (6*Sqrt[ArcTan[a*x]])/(a
^4*c^2) - (3*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(a^4*c^2) +
 2*a*Defer[Int][x^4/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x^3}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{6\int \frac{x^2}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}+(2a)\int \frac{}{\left(c+a^2c\right.}$$

$$= -\frac{2x^3}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+(2a)\int \frac{x^4}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx+\frac{6\,\text{Sub}}{}$$

$$= -\frac{2x^3}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+(2a)\int \frac{x^4}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx+\frac{6\,\text{Sub}}{}$$

$$= -\frac{2x^3}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{6\sqrt{\tan^{-1}(ax)}}{a^4c^2}+(2a)\int \frac{x^4}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}}}$$

$$= -\frac{2x^3}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{6\sqrt{\tan^{-1}(ax)}}{a^4c^2}+(2a)\int \frac{x^4}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}}}$$

$$= -\frac{2x^3}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{6\sqrt{\tan^{-1}(ax)}}{a^4c^2}-\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^4c^2}+(2a)$$

Mathematica [A] time = 4.49, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.61, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2 c\,x^2+c\right)^2 \arctan\left(a x\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
[Out] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^{3/2}\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
[Out] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^4x^4\,\mathrm{atan}^{\frac{3}{2}}(ax)+2a^2x^2\,\mathrm{atan}^{\frac{3}{2}}(ax)+\mathrm{atan}^{\frac{3}{2}}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x**3/(a**4*x**4*atan(a*x)**(3/2) + 2*a**2*x**2*atan(a*x)**(3/2) +
atan(a*x)**(3/2)), x)/c**2
```

3.991 $\int \frac{x^2}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} dx$

Optimal. Leaf size=60

$$\frac{2\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^3c^2} - \frac{2x^2}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

[Out] 2*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^3/c^2-2*x^2/a/c^2/(a^2*x^2+1)/arctan(a*x)^(1/2)

Rubi [A] time = 0.14, antiderivative size = 60, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4942, 4970, 4406, 12, 3305, 3351}

$$\frac{2\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^3c^2} - \frac{2x^2}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

[In] Int[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]

[Out] (-2*x^2)/(a*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + (2*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(a^3*c^2)

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx &= -\frac{2x^2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\int \frac{x}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}\\
&= -\frac{2x^2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^3c^2}\\
&= -\frac{2x^2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^3c^2}\\
&= -\frac{2x^2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{2\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^3c^2}\\
&= -\frac{2x^2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\,\mathrm{Subst}\left(\int \sin\left(2x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2}\\
&= -\frac{2x^2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^3c^2}
\end{aligned}$$

Mathematica [A] time = 0.19, size = 60, normalized size = 1.00

$$\frac{2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^3c^2}-\frac{2x^2}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^2)/(a*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + (2*Sqrt[Pi]*FresnelS[(2*
Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(a^3*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [**A**] time = 0.38, size = 46, normalized size = 0.77

$$\frac{2\sqrt{\arctan (ax)}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+\cos (2\arctan (ax))-1}{a^{3}c^{2}\sqrt{\arctan (ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
[Out] 1/a^3/c^2*(2*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/
2))+cos(2*arctan(a*x))-1)/arctan(a*x)^(1/2)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
[Out] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{2}}{a^{4} x^{4} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 2 a^{2} x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
[Out] Integral(x**2/(a**4*x**4*atan(a*x)**(3/2) + 2*a**2*x**2*atan(a*x)**(3/2) +
atan(a*x)**(3/2)), x)/c**2
```

3.992 $\int \frac{x}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} dx$

Optimal. Leaf size=138

$$\frac{2\sqrt{\pi}\, C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^2c^2}-\frac{2x}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(a^2x^2+1\right)}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(a^2x^2+1\right)}+\frac{4\sqrt{\tan^{-1}(ax)}}{a^2c^2}$$

```
[Out] 2*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^2-2*x/a/c^2/(a^2*x^
2+1)/arctan(a*x)^(1/2)+4*arctan(a*x)^(1/2)/a^2/c^2-8*arctan(a*x)^(1/2)/a^2/
c^2/(a^2*x^2+1)+4*(-a^2*x^2+1)*arctan(a*x)^(1/2)/a^2/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.17, antiderivative size = 138, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4932, 4930, 4904, 3312, 3304, 3352}

$$\frac{2\sqrt{\pi}\, \text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^2c^2}-\frac{2x}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(a^2x^2+1\right)}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(a^2x^2+1\right)}+\frac{4\sqrt{\tan^{-1}(ax)}}{a^2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x)/(a*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + (4*Sqrt[ArcTan[a*x]])/(a^2
*c^2) - (8*Sqrt[ArcTan[a*x]])/(a^2*c^2*(1 + a^2*x^2)) + (4*(1 - a^2*x^2)*Sq
rt[ArcTan[a*x]])/(a^2*c^2*(1 + a^2*x^2)) + (2*Sqrt[Pi]*FresnelC[(2*Sqrt[Arc
Tan[a*x]])/Sqrt[Pi]])/(a^2*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
```

```
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4932

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*(x_))/((d_) + (e_.)*(x_)^2)^2,
 x_Symbol] :> Simp[(x*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p + 1)*(d + e*x^
2)), x] + (-Dist[4/(b^2*(p + 1)*(p + 2)), Int[(x*(a + b*ArcTan[c*x])^(p + 2
))/(d + e*x^2)^2, x], x] - Simp[((1 - c^2*x^2)*(a + b*ArcTan[c*x])^(p + 2))
/(b^2*e*(p + 1)*(p + 2)*(d + e*x^2)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[p, -1] && NeQ[p, -2]
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+16\int \frac{x\sqrt{\tan^{-1}(ax)}}{\left(c+a^2cx^2\right)^2}$$

$$= -\frac{2x}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4}{}$$

$$= -\frac{2x}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4}{}$$

$$= -\frac{2x}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4}{}$$

$$= -\frac{2x}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\sqrt{\tan^{-1}(ax)}}{a^2c^2}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4\left(1-a^2x^2\right)}{a^2c^2\left(1\right.}$$

$$= -\frac{2x}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\sqrt{\tan^{-1}(ax)}}{a^2c^2}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4\left(1-a^2x^2\right)}{a^2c^2\left(1\right.}$$

$$= -\frac{2x}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{4\sqrt{\tan^{-1}(ax)}}{a^2c^2}-\frac{8\sqrt{\tan^{-1}(ax)}}{a^2c^2\left(1+a^2x^2\right)}+\frac{4\left(1-a^2x^2\right)}{a^2c^2\left(1\right.}$$

Mathematica [C] time = 0.19, size = 158, normalized size = 1.14

$$\frac{4\sqrt{\pi}\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)-i\sqrt{2}\left(a^2x^2+1\right)\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)+i\sqrt{2}\left(a^2x^2+1\right.}{4a^2c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-8*a*x + 4*Sqrt[Pi]*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]*FresnelC[(2*Sqrt[ArcTa
n[a*x]])/Sqrt[Pi]] - I*Sqrt[2]*(1 + a^2*x^2)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1
/2, (-2*I)*ArcTan[a*x]] + I*Sqrt[2]*(1 + a^2*x^2)*Sqrt[I*ArcTan[a*x]]*Gamma
[1/2, (2*I)*ArcTan[a*x]])/(4*a^2*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.27, size = 47, normalized size = 0.34

$$\frac{2\sqrt{\arctan\left(ax\right)}\,\sqrt{\pi}\;\mathrm{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-\sin\left(2\arctan\left(ax\right)\right)}{a^{2}c^{2}\sqrt{\arctan\left(ax\right)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] 1/a^2/c^2*(2*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/
2))-sin(2*arctan(a*x)))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{4}x^{4}\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}+2a^{2}x^{2}\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}+\operatorname{atan}^{\frac{3}{2}}{\left(ax\right)}}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x/(a**4*x**4*atan(a*x)**(3/2) + 2*a**2*x**2*atan(a*x)**(3/2) + ata
n(a*x)**(3/2)), x)/c**2
```

3.993 $\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=57

$$-\frac{2}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}-\frac{2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{ac^2}$$

```
[Out] -2*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^2-2/a/c^2/(a^2*x^2+1
)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.10, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4902, 4970, 4406, 12, 3305, 3351}

$$-\frac{2}{ac^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}-\frac{2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{ac^2}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - (2*Sqrt[Pi]*FresnelS[(2*Sqrt[A
rcTan[a*x]])/Sqrt[Pi]])/(a*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx &= -\frac{2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-(4a)\int \frac{x}{\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx\\
&= -\frac{2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{4\,\mathrm{Subst}\left(\int \frac{\cos(x)\sin(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{ac^2}\\
&= -\frac{2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{4\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{2\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{ac^2}\\
&= -\frac{2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{2\,\mathrm{Subst}\left(\int \frac{\sin(2x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{ac^2}\\
&= -\frac{2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{4\,\mathrm{Subst}\left(\int \sin\left(2x^2\right)\,dx,x,\sqrt{\tan^{-1}(ax)}\right)}{ac^2}\\
&= -\frac{2}{ac^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{ac^2}
\end{aligned}$$

Mathematica [A] time = 0.17, size = 52, normalized size = 0.91

$$\frac{-\frac{2}{\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}-2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{ac^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2/((1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - 2*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[
a*x]])/Sqrt[Pi]])/(a*c^2)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.54, size = 47, normalized size = 0.82

$$-\frac{2\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+\cos(2\arctan(ax))+1}{a\,c^2\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] -1/a/c^2*(2*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2
))+cos(2*arctan(a*x))+1)/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4}x^{4}\operatorname{atan}^{\frac{3}{2}}{(ax)}+2a^{2}x^{2}\operatorname{atan}^{\frac{3}{2}}{(ax)}+\operatorname{atan}^{\frac{3}{2}}{(ax)}}\,dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**4*x**4*atan(a*x)**(3/2) + 2*a**2*x**2*atan(a*x)**(3/2) + ata
n(a*x)**(3/2)), x)/c**2
```

3.994 $\int \frac{1}{x\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=102

$$-\frac{2\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{ac^2x\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}-\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{c^2}-\frac{6\sqrt{\tan^{-1}(ax)}}{c^2}$$

```
[Out] -3*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/c^2-2/a/c^2/x/(a^2*x^2+1
)/arctan(a*x)^(1/2)-6*arctan(a*x)^(1/2)/c^2-2*Unintegrable(1/x^2/(a^2*c*x^2
+c)^2/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^2*x*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - (6*Sqrt[ArcTan[a*x]])/c^2 -
(3*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/c^2 - (2*Defer[Int][1
/(x^2*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/a
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx = -\frac{2}{ac^2x\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(6a)\int \frac{}{(c+}$$

$$= -\frac{2}{ac^2x\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}-\frac{6\,\text{Subst}\left(\int\right.}{}$$

$$= -\frac{2}{ac^2x\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}-\frac{6\,\text{Subst}\left(\int\right.}{}$$

$$= -\frac{2}{ac^2x\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{6\sqrt{\tan^{-1}(ax)}}{c^2}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,d}{a}$$

$$= -\frac{2}{ac^2x\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{6\sqrt{\tan^{-1}(ax)}}{c^2}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,d}{a}$$

$$= -\frac{2}{ac^2x\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{6\sqrt{\tan^{-1}(ax)}}{c^2}-\frac{3\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{c^2}-\frac{2}{}$$

Mathematica [A] time = 4.77, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.58, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{5} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 2 a^{2} x^{3} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**4*x**5*atan(a*x)**(3/2) + 2*a**2*x**3*atan(a*x)**(3/2) + x*a
tan(a*x)**(3/2)), x)/c**2
```

3.995 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=93

$$-8a\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)-\frac{4\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{ac^2x^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c^2/x^2/(a^2*x^2+1)/arctan(a*x)^(1/2)-4*Unintegrable(1/x^3/(a^2*c*x^2+
c)^2/arctan(a*x)^(1/2),x)/a-8*a*Unintegrable(1/x/(a^2*c*x^2+c)^2/arctan(a*x
)^(1/2),x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^2*x^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - (4*Defer[Int][1/(x^3*(c +
a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/a - 8*a*Defer[Int][1/(x*(c + a^2*c*x^2
)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{ac^2x^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{4\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(8a)\int \frac{}{x\left(c+\right.}$$

Mathematica [A] time = 4.76, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.12, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{6} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 2 a^{2} x^{4} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**4*x**6*atan(a*x)**(3/2) + 2*a**2*x**4*atan(a*x)**(3/2) + x**
2*atan(a*x)**(3/2)), x)/c**2
```

3.996 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=93

$$-10a\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)-\frac{6\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{ac^2x^3\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c^2/x^3/(a^2*x^2+1)/arctan(a*x)^(1/2)-6*Unintegrable(1/x^4/(a^2*c*x^2+
c)^2/arctan(a*x)^(1/2),x)/a-10*a*Unintegrable(1/x^2/(a^2*c*x^2+c)^2/arctan(
a*x)^(1/2),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^2*x^3*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - (6*Defer[Int][1/(x^4*(c +
a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/a - 10*a*Defer[Int][1/(x^2*(c + a^2*c*
x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{ac^2x^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{6\int \frac{1}{x^4\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(10a)\int \frac{}{x^2\left(\right.}$$

Mathematica [A] time = 7.04, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 5.43, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c\, x^{2}+c\right)^{2} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{7} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 2 a^{2} x^{5} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + x^{3} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**4*x**7*atan(a*x)**(3/2) + 2*a**2*x**5*atan(a*x)**(3/2) + x**
3*atan(a*x)**(3/2)), x)/c**2
```

3.997 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=93

$$-\frac{8\text{Int}\left(\frac{1}{x^5\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{a}-12a\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)-\frac{2}{ac^2x^4\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c^2/x^4/(a^2*x^2+1)/arctan(a*x)^(1/2)-8*Unintegrable(1/x^5/(a^2*c*x^2+
c)^2/arctan(a*x)^(1/2),x)/a-12*a*Unintegrable(1/x^3/(a^2*c*x^2+c)^2/arctan(
a*x)^(1/2),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^2*x^4*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - (8*Defer[Int][1/(x^5*(c +
a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/a - 12*a*Defer[Int][1/(x^3*(c + a^2*c*
x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx = -\frac{2}{ac^2x^4\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{8\int \frac{1}{x^5\left(c+a^2cx^2\right)^2\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(12a)\int \frac{}{x^3\left(\right.}$$

Mathematica [A] time = 7.27, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.66, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(a^2 c\, x^2 + c\right)^2 \arctan\left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^4 x^8 \operatorname{atan}^{\frac{3}{2}}(ax) + 2a^2 x^6 \operatorname{atan}^{\frac{3}{2}}(ax) + x^4 \operatorname{atan}^{\frac{3}{2}}(ax)}\, dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**2/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**4*x**8*atan(a*x)**(3/2) + 2*a**2*x**6*atan(a*x)**(3/2) + x**
4*atan(a*x)**(3/2)), x)/c**2
```

3.998 $\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx = \int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx$$

Mathematica [A] time = 1.44, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral(x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*
x)^(3/2)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.41, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
[Out] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
[Out] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
[Out] Timed out
```

3.999 $\int \frac{x^3}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=96

$$-\frac{\sqrt{\frac{\pi}{2}}\, C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^3}+\frac{\sqrt{\pi}\, C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^4c^3}-\frac{2x^3}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -1/2*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^4/c^
3+FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^3-2*x^3/a/c^3/(a^2*
x^2+1)^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.33, antiderivative size = 96, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4968, 4970, 3312, 3304, 3352, 4406}

$$-\frac{\sqrt{\frac{\pi}{2}}\, \text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^3}+\frac{\sqrt{\pi}\, \text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^4c^3}-\frac{2x^3}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^3)/(a*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) - (Sqrt[Pi/2]*FresnelC[2
*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^4*c^3) + (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcT
an[a*x]])/Sqrt[Pi]])/(a^4*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
```

```
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x^3}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}+\frac{6\int\frac{x^2}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(2a)\int\frac{}{\left(c+a^2c\right.}$$

$$= -\frac{2x^3}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2\,\text{Subst}\left(\int\frac{\sin^4(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{a^4c^3}+\frac{6\,\text{Sub}}{}$$

$$= -\frac{2x^3}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2\,\text{Subst}\left(\int\left(\frac{3}{8\sqrt{x}}-\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx,x,\text{ta}\right.}{a^4c^3}$$

$$= -\frac{2x^3}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{\text{Subst}\left(\int\frac{\cos(4x)}{\sqrt{x}}\,dx,x,\tan^{-1}(ax)\right)}{4a^4c^3}-\frac{3\,\text{Subst}}{}$$

$$= -\frac{2x^3}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{\text{Subst}\left(\int\cos\left(4x^2\right)dx,x,\sqrt{\tan^{-1}(ax)}\right)}{2a^4c^3}-\frac{3}{}$$

$$= -\frac{2x^3}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^3}+\frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}}}{\sqrt{\pi}}\right.}{a^4c^3}$$

Mathematica [C] time = 0.37, size = 148, normalized size = 1.54

$$\frac{\frac{-\frac{32a^3x^3}{\left(a^2x^2+1\right)^2}+3i\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-4i\tan^{-1}(ax)\right)-3i\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},4i\tan^{-1}(ax)\right)}{\sqrt{\tan^{-1}(ax)}}-2\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)+16\sqrt{\pi}\,C\left(\frac{2\sqrt{t}}{}\right.}{16a^4c^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + 16*Sqrt[Pi]*Fresn
elC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + ((-32*a^3*x^3)/(1 + a^2*x^2)^2 + (3*I
)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] - (3*I)*Sqrt[I*ArcT
an[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/Sqrt[ArcTan[a*x]])/(16*a^4*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.50, size = 86, normalized size = 0.90

$$-\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-4\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\operatorname{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+2\sin(2\operatorname{arc}}{4a^4c^3\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

```
[Out] -1/4/a^4/c^3*(2*2^(1/2)*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelC(2*2^(1/2)/Pi^(1
/2)*arctan(a*x)^(1/2))-4*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelC(2*arctan(a*x)^
(1/2)/Pi^(1/2))+2*sin(2*arctan(a*x))-sin(4*arctan(a*x)))/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\operatorname{atan}(a\,x)^{3/2}\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^6x^6\operatorname{atan}^{\frac{3}{2}}(ax)+3a^4x^4\operatorname{atan}^{\frac{3}{2}}(ax)+3a^2x^2\operatorname{atan}^{\frac{3}{2}}(ax)+\operatorname{atan}^{\frac{3}{2}}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x**3/(a**6*x**6*atan(a*x)**(3/2) + 3*a**4*x**4*atan(a*x)**(3/2) +
3*a**2*x**2*atan(a*x)**(3/2) + atan(a*x)**(3/2)), x)/c**3
```

3.1000 $\int \frac{x^2}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=67

$$\frac{\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^3}-\frac{2x^2}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

```
[Out] 1/2*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^3/c^3
-2*x^2/a/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.31, antiderivative size = 67, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4968, 4970, 4406, 3305, 3351}

$$\frac{\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^3}-\frac{2x^2}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^2)/(a*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) + (Sqrt[Pi/2]*FresnelS[2
*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^3*c^3)
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
```

```
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x^2}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{4\int \frac{x}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a} - (4a)\int \frac{}{\left(c+a^2cx^2\right.}$$

$$= -\frac{2x^2}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{4\,\mathrm{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^3c^3} - \frac{4\,\mathrm{Su}}{}$$

$$= -\frac{2x^2}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} - \frac{4\,\mathrm{Subst}\left(\int \left(\frac{\sin(2x)}{4\sqrt{x}} - \frac{\sin(4x)}{8\sqrt{x}}\right)dx, x, \tan^{-1}(ax)\right)}{a^3c^3}$$

$$= -\frac{2x^2}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + 2\frac{\mathrm{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{2a^3c^3}$$

$$= -\frac{2x^2}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + 2\frac{\mathrm{Subst}\left(\int \sin\left(4x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{a^3c^3}$$

$$= -\frac{2x^2}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^3}$$

Mathematica [C] time = 0.41, size = 112, normalized size = 1.67

$$\frac{-8a^2x^2 - \left(a^2x^2+1\right)^2\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2}, -4i\tan^{-1}(ax)\right) - \left(a^2x^2+1\right)^2\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2}, 4i\tan^{-1}(ax)\right)}{4a^3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-8*a^2*x^2 - (1 + a^2*x^2)^2*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcT
an[a*x]] - (1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]
])/(4*a^3*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.52, size = 53, normalized size = 0.79

$$\frac{2\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan(ax)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+\cos(4\arctan(ax))-1}{4a^3c^3\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

```
[Out] 1/4/a^3/c^3*(2*2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*FresnelS(2*2^(1/2)/Pi^(1/
2)*arctan(a*x)^(1/2))+cos(4*arctan(a*x))-1)/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\mathrm{atan}(a\,x)^{3/2}\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^6x^6\,\mathrm{atan}^{\frac{3}{2}}(ax)+3a^4x^4\,\mathrm{atan}^{\frac{3}{2}}(ax)+3a^2x^2\,\mathrm{atan}^{\frac{3}{2}}(ax)+\mathrm{atan}^{\frac{3}{2}}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x**2/(a**6*x**6*atan(a*x)**(3/2) + 3*a**4*x**4*atan(a*x)**(3/2) +
3*a**2*x**2*atan(a*x)**(3/2) + atan(a*x)**(3/2)), x)/c**3
```

3.1001 $\int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=93

$$\frac{\sqrt{\frac{\pi}{2}}\, C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^3}+\frac{\sqrt{\pi}\, C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^2c^3}-\frac{2x}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

```
[Out] 1/2*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^2/c^3
+FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a^2/c^3-2*x/a/c^3/(a^2*x^2
+1)^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 7, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.318, Rules used = {4968, 4970, 4406, 3304, 3352, 4904, 3312}

$$\frac{\sqrt{\frac{\pi}{2}}\, \text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^3}+\frac{\sqrt{\pi}\, \text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^2c^3}-\frac{2x}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x)/(a*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) + (Sqrt[Pi/2]*FresnelC[2*S
qrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*c^3) + (Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan
[a*x]])/Sqrt[Pi]])/(a^2*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
```

```
+ 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{2\int \frac{1}{\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a} - (6a)\int \frac{}{\left(c+a^2c\right.}$$

$$= -\frac{2x}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{2\,\text{Subst}\left(\int \frac{\cos^4(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{a^2c^3} - \frac{6\,\text{Sub}}{}$$

$$= -\frac{2x}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{2\,\text{Subst}\left(\int \left(\frac{3}{8\sqrt{x}}+\frac{\cos(2x)}{2\sqrt{x}}+\frac{\cos(4x)}{8\sqrt{x}}\right)dx, x, \text{t}\right.}{a^2c^3}$$

$$= -\frac{2x}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{\text{Subst}\left(\int \frac{\cos(4x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{4a^2c^3} + \frac{3\,\text{Subs}}{}$$

$$= -\frac{2x}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{\text{Subst}\left(\int \cos\left(4x^2\right)dx, x, \sqrt{\tan^{-1}(ax)}\right)}{2a^2c^3} + \frac{3}{}$$

$$= -\frac{2x}{ac^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^3} + \frac{\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}}}{\sqrt{\pi}}\right.}{a^2c^3}$$

Mathematica [C] time = 0.26, size = 156, normalized size = 1.68

$$\frac{-\frac{8ax}{\left(a^2x^2+1\right)^2} - i\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right) + i\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right) - i\sqrt{-i\tan^{-1}(ax)}\,\Gamma}{4a^2c^3\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] ((-8*a*x)/(1 + a^2*x^2)^2 - I*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2
*I)*ArcTan[a*x]] + I*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*
```

```
x]] - I*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + I*Sqrt[I*Ar
cTan[a*x]]*Gamma[1/2, (4*I)*ArcTan[a*x]])/(4*a^2*c^3*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 0.44, size = 84, normalized size = 0.90

$$-\frac{-2\sqrt{2}\,\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)-4\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\operatorname{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+2\sin(2\operatorname{ar}}{4a^2c^3\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
[Out] -1/4/a^2/c^3/arctan(a*x)^(1/2)*(-2*2^(1/2)*arctan(a*x)^(1/2)*Pi^(1/2)*Fresn
elC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))-4*arctan(a*x)^(1/2)*Pi^(1/2)*Fres
nelC(2*arctan(a*x)^(1/2)/Pi^(1/2))+2*sin(2*arctan(a*x))+sin(4*arctan(a*x)))
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\operatorname{atan}(a\,x)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
[Out] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^6x^6\operatorname{atan}^{\frac{3}{2}}(ax)+3a^4x^4\operatorname{atan}^{\frac{3}{2}}(ax)+3a^2x^2\operatorname{atan}^{\frac{3}{2}}(ax)+\operatorname{atan}^{\frac{3}{2}}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x/(a**6*x**6*atan(a*x)**(3/2) + 3*a**4*x**4*atan(a*x)**(3/2) + 3*a
**2*x**2*atan(a*x)**(3/2) + atan(a*x)**(3/2)), x)/c**3
```

3.1002 $\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} dx$

Optimal. Leaf size=94

$$-\frac{2}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^3}-\frac{2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{ac^3}$$

```
[Out] -1/2*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a/c^3-
2*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^3-2/a/c^3/(a^2*x^2+1)
^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.14, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {4902, 4970, 4406, 3305, 3351}

$$-\frac{2}{ac^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{\sqrt{\frac{\pi}{2}}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^3}-\frac{2\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{ac^3}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) - (Sqrt[Pi/2]*FresnelS[2*Sqrt[
2/Pi]*Sqrt[ArcTan[a*x]]])/(a*c^3) - (2*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x
]])/Sqrt[Pi]])/(a*c^3)
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
```

```
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}} dx = -\frac{2}{ac^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} - (8a)\int \frac{x}{\left(c+a^2cx^2\right)^3 \sqrt{\tan^{-1}(ax)}} dx$$

$$= -\frac{2}{ac^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} - \frac{8\,\mathrm{Subst}\left(\int \frac{\cos^3(x)\sin(x)}{\sqrt{x}} dx, x, \tan^{-1}(ax)\right)}{ac^3}$$

$$= -\frac{2}{ac^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} - \frac{8\,\mathrm{Subst}\left(\int \left(\frac{\sin(2x)}{4\sqrt{x}} + \frac{\sin(4x)}{8\sqrt{x}}\right) dx, x, \tan^{-1}(ax\right.}{ac^3}$$

$$= -\frac{2}{ac^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} - \frac{\mathrm{Subst}\left(\int \frac{\sin(4x)}{\sqrt{x}} dx, x, \tan^{-1}(ax)\right)}{ac^3} - \frac{2\,\mathrm{Subst}}{}$$

$$= -\frac{2}{ac^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} - \frac{2\,\mathrm{Subst}\left(\int \sin\left(4x^2\right) dx, x, \sqrt{\tan^{-1}(ax)}\right)}{ac^3} -$$

$$= -\frac{2}{ac^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} - \frac{\sqrt{\frac{\pi}{2}}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^3} - \frac{2\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-}}}{\sqrt{\pi}}\right.}{ac^3}$$

Mathematica [C] time = 0.32, size = 144, normalized size = 1.53

$$\frac{-\frac{8}{\left(a^2x^2+1\right)^2} + 2\sqrt{2}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2}, -2i\tan^{-1}(ax)\right) + 2\sqrt{2}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2}, 2i\tan^{-1}(ax)\right) + \sqrt{-i\tan^{-1}(ax)}\,\Gamma}{4ac^3\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-8/(1 + a^2*x^2)^2 + 2*Sqrt[2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-2*I)*Ar
cTan[a*x]] + 2*Sqrt[2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (2*I)*ArcTan[a*x]] +
Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-4*I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]
*Gamma[1/2, (4*I)*ArcTan[a*x]])/(4*a*c^3*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.64, size = 85, normalized size = 0.90

$$-\frac{2\sqrt{2}\,\sqrt{\pi}\,\sqrt{\arctan(ax)}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+8\sqrt{\arctan(ax)}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)+4\cos(2\arctan(ax))+\cos(4}{4a\,c^{3}\sqrt{\arctan(ax)}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

```
[Out] -1/4/a/c^3*(2*2^(1/2)*Pi^(1/2)*arctan(a*x)^(1/2)*FresnelS(2*2^(1/2)/Pi^(1/2
)*arctan(a*x)^(1/2))+8*arctan(a*x)^(1/2)*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1
/2)/Pi^(1/2))+4*cos(2*arctan(a*x))+cos(4*arctan(a*x))+3)/arctan(a*x)^(1/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}(a\,x)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6}x^{6}\operatorname{atan}^{\frac{3}{2}}{(ax)}+3a^{4}x^{4}\operatorname{atan}^{\frac{3}{2}}{(ax)}+3a^{2}x^{2}\operatorname{atan}^{\frac{3}{2}}{(ax)}+\operatorname{atan}^{\frac{3}{2}}{(ax)}}\,dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**6*x**6*atan(a*x)**(3/2) + 3*a**4*x**4*atan(a*x)**(3/2) + 3*a
**2*x**2*atan(a*x)**(3/2) + atan(a*x)**(3/2)), x)/c**3
```

3.1003 $\int \frac{1}{x(c+a^2cx^2)^3 \tan^{-1}(ax)^{3/2}} dx$

Optimal. Leaf size=140

$$-\frac{2\text{Int}\left(\frac{1}{x^2(a^2cx^2+c)^3\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{ac^3x\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{5\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{4c^3}-\frac{5\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(a}}{\sqrt{\pi}}\right.}{c^3}$$

```
[Out] -5/8*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/c^3-5*
FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/c^3-2/a/c^3/x/(a^2*x^2+1)^2
/arctan(a*x)^(1/2)-15/2*arctan(a*x)^(1/2)/c^3-2*Unintegrable(1/x^2/(a^2*c*x
^2+c)^3/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.23, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^3*x*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) - (15*Sqrt[ArcTan[a*x]])/(2*
c^3) - (5*Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(4*c^3) - (5
*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/c^3 - (2*Defer[Int][1/(
x^2*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/a
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{ac^3x\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2\int\frac{1}{x^2\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(10a)\int\frac{}{(c}$$

$$=-\frac{2}{ac^3x\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2\int\frac{1}{x^2\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a}-\frac{10\,\text{Subst}\left(\right.}{}$$

$$=-\frac{2}{ac^3x\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2\int\frac{1}{x^2\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a}-\frac{10\,\text{Subst}\left(\right.}{}$$

$$=-\frac{2}{ac^3x\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{15\sqrt{\tan^{-1}(ax)}}{2c^3}-\frac{2\int\frac{1}{x^2\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax}}}{a}$$

$$=-\frac{2}{ac^3x\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{15\sqrt{\tan^{-1}(ax)}}{2c^3}-\frac{2\int\frac{1}{x^2\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax}}}{a}$$

$$=-\frac{2}{ac^3x\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{15\sqrt{\tan^{-1}(ax)}}{2c^3}-\frac{5\sqrt{\frac{\pi}{2}}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(\right.}{4c^3}$$

Mathematica [A] time = 5.35, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 4.60, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^2c\,x^2+c\right)^3\arctan\left(ax\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
[Out] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^7\operatorname{atan}^{\frac{3}{2}}(ax)+3a^4x^5\operatorname{atan}^{\frac{3}{2}}(ax)+3a^2x^3\operatorname{atan}^{\frac{3}{2}}(ax)+x\operatorname{atan}^{\frac{3}{2}}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**6*x**7*atan(a*x)**(3/2) + 3*a**4*x**5*atan(a*x)**(3/2) + 3*a
**2*x**3*atan(a*x)**(3/2) + x*atan(a*x)**(3/2)), x)/c**3
```

3.1004 $\int \frac{1}{x^2(c+a^2cx^2)^3 \tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=93

$$-12a\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)-\frac{4\text{Int}\left(\frac{1}{x^3(a^2cx^2+c)^3\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{ac^3x^2\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c^3/x^2/(a^2*x^2+1)^2/arctan(a*x)^(1/2)-4*Unintegrable(1/x^3/(a^2*c*x^
2+c)^3/arctan(a*x)^(1/2),x)/a-12*a*Unintegrable(1/x/(a^2*c*x^2+c)^3/arctan(
a*x)^(1/2),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^3*x^2*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) - (4*Defer[Int][1/(x^3*(c
+ a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/a - 12*a*Defer[Int][1/(x*(c + a^2*c*
x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{ac^3x^2\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{4\int \frac{1}{x^3(c+a^2cx^2)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(12a)\int \frac{}{x(}$$

Mathematica [A] time = 6.54, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.71, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c\,x^{2}+c\right)^{3} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
[Out] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
[Out] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{8} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 3 a^{4} x^{6} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 3 a^{2} x^{4} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + x^{2} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
[Out] Integral(1/(a**6*x**8*atan(a*x)**(3/2) + 3*a**4*x**6*atan(a*x)**(3/2) + 3*a
**2*x**4*atan(a*x)**(3/2) + x**2*atan(a*x)**(3/2)), x)/c**3
```

3.1005 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=93

$$-14a\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)-\frac{6\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{ac^3x^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c^3/x^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)-6*Unintegrable(1/x^4/(a^2*c*x^
2+c)^3/arctan(a*x)^(1/2),x)/a-14*a*Unintegrable(1/x^2/(a^2*c*x^2+c)^3/arcta
n(a*x)^(1/2),x)
```

Rubi [A] time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^3*x^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) - (6*Defer[Int][1/(x^4*(c
+ a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/a - 14*a*Defer[Int][1/(x^2*(c + a^2*
c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{ac^3x^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{6\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(14a)\int \frac{}{x^2 (}$$

Mathematica [A] time = 7.69, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 9.06, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{9} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 3 a^{4} x^{7} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 3 a^{2} x^{5} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + x^{3} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**6*x**9*atan(a*x)**(3/2) + 3*a**4*x**7*atan(a*x)**(3/2) + 3*a
**2*x**5*atan(a*x)**(3/2) + x**3*atan(a*x)**(3/2)), x)/c**3
```

3.1006 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=93

$$-\frac{8\mathrm{Int}\left(\frac{1}{x^5\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)}{a}-16a\mathrm{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)-\frac{2}{ac^3x^4\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c^3/x^4/(a^2*x^2+1)^2/arctan(a*x)^(1/2)-8*Unintegrable(1/x^5/(a^2*c*x^
2+c)^3/arctan(a*x)^(1/2),x)/a-16*a*Unintegrable(1/x^3/(a^2*c*x^2+c)^3/arcta
n(a*x)^(1/2),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c^3*x^4*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]]) - (8*Defer[Int][1/(x^5*(c
+ a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/a - 16*a*Defer[Int][1/(x^3*(c + a^2*
c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{ac^3x^4\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{8\int \frac{1}{x^5\left(c+a^2cx^2\right)^3\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(16a)\int \frac{}{x^3}$$

Mathematica [A] time = 7.56, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 4.61, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c\, x^{2}+c\right)^{3} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{10} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 3 a^{4} x^{8} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + 3 a^{2} x^{6} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)} + x^{4} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**3/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(a**6*x**10*atan(a*x)**(3/2) + 3*a**4*x**8*atan(a*x)**(3/2) + 3*
a**2*x**6*atan(a*x)**(3/2) + x**4*atan(a*x)**(3/2)), x)/c**3
```

3.1007 $\int \frac{x^m \sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^{3/2}},x\right)$$

[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2),x]

[Out] Defer[Int][(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2), x]

Rubi steps

$$\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}} \, dx = \int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}} \, dx$$

Mathematica [A] time = 0.73, size = 0, normalized size = 0.00

$$\int \frac{x^m\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2),x]

[Out] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2), x]

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\arctan(ax)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x)^(3/2), x)

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="giac")

[Out] Exception raised: TypeError >> An error occurred running a Giac command:INPUT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m & i,const vecteur & l) Error: Bad Argument Value

maple [A] time = 3.36, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{a^{2} c \,x^{2}+c}}{\arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,\sqrt{c\,a^2\,x^2+c}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x**m*sqrt(c*(a**2*x**2 + 1))/atan(a*x)**(3/2), x)
```

3.1008 $\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.89, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.02, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{a^2c\,x^2+c}}{\arctan\left(ax\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\sqrt{c\,a^2\,x^2+c}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c\left(a^{2}x^{2}+1\right)}}{\operatorname{atan}^{\frac{3}{2}}{\left(ax \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(1/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))/atan(a*x)**(3/2), x)
```

3.1009 $\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^{3/2}},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(3/2),x]

[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(3/2), x]

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 0.46, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(3/2),x]

[Out] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(3/2), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.42, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^2 c\, x^2 + c}}{\arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)
[Out] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\, a^2\, x^2 + c}}{\mathrm{atan}\left(a\, x\right)^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^(3/2),x)
[Out] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/atan(a*x)**(3/2),x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/atan(a*x)**(3/2), x)
```

3.1010 $\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{x\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{3/2}}\,dx = \int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 4.89, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.84, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c \,x^{2}+c}}{x \arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(3/2),x)
[Out] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^(3/2)),x)
[Out] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/x/atan(a*x)**(3/2),x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/(x*atan(a*x)**(3/2)), x)
```

3.1011 $\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^m}{\arctan(ax)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x)^(3/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.02, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{\arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1012 $\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 7.19, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.79, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}{\arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x*(c*(a**2*x**2 + 1))**(3/2)/atan(a*x)**(3/2), x)
```

3.1013 $\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.42, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.50, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}}}{\arctan\left(a x\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^(3/2),x)
```

```
[Out] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{\operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/atan(a*x)**(3/2), x)
```

3.1014 $\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{x\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^{3/2}}\,dx = \int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 9.79, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{x \arctan \left(a x \right)^{\frac{3}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(3/2),x)
[Out] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^(3/2)),x)
[Out] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}}}{x \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/x/atan(a*x)**(3/2),x)
[Out] Integral((c*(a**2*x**2 + 1))**(3/2)/(x*atan(a*x)**(3/2)), x)
```

3.1015 $\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.49, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m}{\arctan\left(ax\right)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m/arctan
(a*x)^(3/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.93, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c\right)^{\frac{5}{2}}}{\arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1016 $\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2),x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 2.73, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2),x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.96, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{\arctan\left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(3/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1017 $\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(3/2),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(3/2), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.17, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(3/2),x]
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(3/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.61, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}}}{\arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^(3/2),x)
```

```
[Out] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1018 $\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{(a^2cx^2+c)^{5/2}}{x\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^{3/2}}\,dx = \int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 4.85, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{5/2}}{x\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.77, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c\right)^{\frac{5}{2}}}{x \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(3/2),x)
[Out] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^(3/2)),x)
[Out] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/x/atan(a*x)**(3/2),x)
[Out] Timed out
```

3.1019 $\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 0.90, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\arctan(ax)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^(3/2)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.14, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\arctan \left(a x \right)^{\frac{3}{2}} \sqrt{a^{2} c \,x^{2}+c}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(x^m/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
[Out] Timed out
```

3.1020 $\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx = \int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.40, size = 0, normalized size = 0.00

$$\int \frac{x}{\arctan(ax)^{\frac{3}{2}}\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{3/2}\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^{\frac{3}{2}}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2)), x)
```

3.1021 $\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(1/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 0.67, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.34, size = 0, normalized size = 0.00

$$\int \frac{1}{\arctan(ax)^{\frac{3}{2}}\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(1/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{3/2}\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c\left(a^2x^2+1\right)}\ \mathrm{atan}^{\frac{3}{2}}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2)), x)
```

3.1022 $\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=68

$$-\frac{2\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2\sqrt{a^2cx^2+c}}{acx\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2*(a^2*c*x^2+c)^(1/2)/a/c/x/arctan(a*x)^(1/2)-2*Unintegrable(1/x^2/(a^2*c*
x^2+c)^(1/2)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*Sqrt[c + a^2*c*x^2])/(a*c*x*Sqrt[ArcTan[a*x]]) - (2*Defer[Int][1/(x^2*S
qrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]), x])/a
```

Rubi steps

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2\sqrt{c+a^2cx^2}}{acx\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}$$

Mathematica [A] time = 5.42, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.66, size = 0, normalized size = 0.00

$$\int \frac{1}{x \arctan(ax)^{\frac{3}{2}} \sqrt{a^2 c x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
[Out] int(1/x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x \operatorname{atan}(a x)^{3/2} \sqrt{c a^2 x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)),x)
[Out] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \sqrt{c \left(a^2 x^2 + 1\right)} \operatorname{atan}^{\frac{3}{2}}(ax)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
[Out] Integral(1/(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2)), x)
```

3.1023 $\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(1/x^2/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 10.87, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas"
)
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.79, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \arctan \left(a x\right)^{\frac{3}{2}} \sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(1/x^2/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \sqrt{c \left(a^{2} x^{2} + 1\right)} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/atan(a*x)**(3/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(1/(x**2*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(3/2)), x)
```

3.1024 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{3/2}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan(ax)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta
n(a*x)^(3/2)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 2.94, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
[Out] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
[Out] Timed out
```

3.1025 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=100

$$\frac{6\mathrm{Int}\left(\frac{x^2}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}+4a\mathrm{Int}\left(\frac{x^4}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{2x^3}{ac\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2*x^3/a/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)+6*Unintegrable(x^2/(a^2*c*
x^2+c)^(3/2)/arctan(a*x)^(1/2),x)/a+4*a*Unintegrable(x^4/(a^2*c*x^2+c)^(3/2
)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^3)/(a*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) + (6*Defer[Int][x^2/((
c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x])/a + 4*a*Defer[Int][x^4/((c + a
^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2x^3}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{6\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}+(4a)\int \frac{}{\left(c+a^2cx\right.}$$

Mathematica [A] time = 5.96, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 9.27, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(a^2c\,x^2+c)^{\frac{3}{2}}\arctan(ax)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}(a\,x)^{3/2}\,(c\,a^2\,x^2+c)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3}{(c(a^2x^2+1))^{\frac{3}{2}}\,\mathrm{atan}^{\frac{3}{2}}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x**3/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**(3/2)), x)
```

3.1026 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=127

$$2a\mathrm{Int}\left(\frac{x^3}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{2x^2}{ac\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}+\frac{4\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c\sqrt{a^2cx^2+c}}$$

```
[Out] 4*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)
^(1/2)/a^3/c/(a^2*c*x^2+c)^(1/2)-2*x^2/a/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^
(1/2)+2*a*Unintegrable(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.43, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^2)/(a*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) + (4*Sqrt[2*Pi]*Sqrt[1
 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^3*c*Sqrt[c + a^2*c*x
^2]) + 2*a*Defer[Int][x^3/((c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2x^2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{4\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}+(2a)\int \frac{}{\left(c+a^2cx\right.}$$

$$=-\frac{2x^2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+(2a)\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx+\frac{\left(4\sqrt{1}\right.}{}$$

$$=-\frac{2x^2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+(2a)\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx+\frac{\left(4\sqrt{1}\right.}{}$$

$$=-\frac{2x^2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+(2a)\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx+\frac{\left(8\sqrt{1}\right.}{}$$

$$=-\frac{2x^2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{4\sqrt{2\pi}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c\sqrt{c+a^2cx^2}}+(2a)\int$$

Mathematica [A] time = 5.80, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 9.00, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2 c\,x^2+c\right)^{\frac{3}{2}} \arctan\left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x**2/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**(3/2)), x)
```

3.1027 $\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=93

$$\frac{2\sqrt{2\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{a^2cx^2+c}}-\frac{2x}{ac\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] 2*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)
^(1/2)/a^2/c/(a^2*c*x^2+c)^(1/2)-2*x/a/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1
/2)
```

Rubi [A] time = 0.18, antiderivative size = 93, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.208, Rules used = {4942, 4905, 4904, 3304, 3352}

$$\frac{2\sqrt{2\pi}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{a^2cx^2+c}}-\frac{2x}{ac\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x)/(a*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) + (2*Sqrt[2*Pi]*Sqrt[1 +
 a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*c*Sqrt[c + a^2*c*x^2
])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
```

```
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rubi steps

$$
\begin{aligned}
\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx &= -\frac{2x}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}\\
&= -\frac{2x}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(2\sqrt{1+a^2x^2}\right)\int \frac{1}{\left(1+a^2x^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{ac\sqrt{c+a^2cx^2}}\\
&= -\frac{2x}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\cos(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(a
}{a^2c\sqrt{c+a^2cx^2}}\\
&= -\frac{2x}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(4\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \cos\left(x^2\right)\,dx,x,\sqrt{\tan
}{a^2c\sqrt{c+a^2cx^2}}\\
&= -\frac{2x}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{2\sqrt{2\pi}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c\sqrt{c+a^2cx^2}}
\end{aligned}
$$

Mathematica [C] time = 0.16, size = 116, normalized size = 1.25

$$
\frac{-i\sqrt{a^2x^2+1}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+i\sqrt{a^2x^2+1}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)-2ax}{a^2c\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}
$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*a*x - I*Sqrt[1 + a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan
[a*x]] + I*Sqrt[1 + a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]])
/(a^2*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 3.33, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c\,x^{2}+c\right)^{\frac{3}{2}} \arctan\left(a x\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(x/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**(3/2)), x)
```

3.1028 $\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=92

$$-\frac{2\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{a^2cx^2+c}}-\frac{2}{ac\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1
)^(1/2)/a/c/(a^2*c*x^2+c)^(1/2)-2/a/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 92, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.217, Rules used = {4902, 4971, 4970, 3305, 3351}

$$-\frac{2\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{a^2cx^2+c}}-\frac{2}{ac\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (2*Sqrt[2*Pi]*Sqrt[1 + a^2
*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a*c*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
```

```
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - (2a)\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

$$= -\frac{2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(2a\sqrt{1+a^2x^2}\right)\int \frac{x}{\left(1+a^2x^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{ac\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \sin\left(x^2\right)\,dx, x, \sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{2\sqrt{2\pi}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac\sqrt{c+a^2cx^2}}$$

Mathematica [C] time = 0.14, size = 107, normalized size = 1.16

$$\frac{\sqrt{a^2x^2+1}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+\sqrt{a^2x^2+1}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)-2}{ac\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
[Out] (-2 + Sqrt[1 + a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]]
 + Sqrt[1 + a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]])/(a*c*Sq
rt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 1.43, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\operatorname{atan}(a\,x)^{3/2}\,\left(c\,a^2\,x^2+c\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(c\left(a^2x^2+1\right)\right)^{\frac{3}{2}}\operatorname{atan}^{\frac{3}{2}}(ax)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/((c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**(3/2)), x)
```

3.1029 $\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=126

$$-\frac{2\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{4\sqrt{2\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{c\sqrt{a^2cx^2+c}}-\frac{2}{acx\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -4*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1
)^(1/2)/c/(a^2*c*x^2+c)^(1/2)-2/a/c/x/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)
-2*Unintegrable(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.33, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (4*Sqrt[2*Pi]*Sqrt[1 + a
^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(c*Sqrt[c + a^2*c*x^2]) - (
2*Defer[Int][1/(x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x])/a
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2}{acx\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(4a)\int \frac{}{(c+}$$

$$=-\frac{2}{acx\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-\frac{\left(4a\sqrt{1+a^2x\right.}{}$$

$$=-\frac{2}{acx\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-\frac{\left(4\sqrt{1+a^2x^2\right.}{}$$

$$=-\frac{2}{acx\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-\frac{\left(8\sqrt{1+a^2x^2\right.}{}$$

$$=-\frac{2}{acx\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{4\sqrt{2\pi}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{c\sqrt{c+a^2cx^2}}-\frac{2\int}{}$$

Mathematica [A] time = 4.92, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

[Out] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.68, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Integral(1/(x*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**(3/2)), x)
```

3.1030 $\int \frac{1}{x^2(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=100

$$-6a\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{4\text{Int}\left(\frac{1}{x^3(a^2cx^2+c)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{acx^2\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c/x^2/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)-4*Unintegrable(1/x^3/(a^2*
c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)/a-6*a*Unintegrable(1/x/(a^2*c*x^2+c)^(3
/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.36, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (4*Defer[Int][1/(x^3*(
c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x])/a - 6*a*Defer[Int][1/(x*(c + a
^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{acx^2\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{4\int \frac{1}{x^3(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(6a)\int$$

Mathematica [A] time = 20.66, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [**A**] time = 1.83, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(a^2 c\, x^2 + c\right)^{\frac{3}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
[Out] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima"
)
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\, \mathrm{atan}\left(a\,x\right)^{3/2}\, {\left(c\,a^2\,x^2+c\right)}^{3/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(c \left(a^{2} x^{2} + 1\right)\right)^{\frac{3}{2}} \operatorname{atan}^{\frac{3}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
[Out] Integral(1/(x**2*(c*(a**2*x**2 + 1))**(3/2)*atan(a*x)**(3/2)), x)
```

3.1031 $\int \frac{1}{x^3(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=100

$$-8a\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{6\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{acx^3\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c/x^3/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)-6*Unintegrable(1/x^4/(a^2*
c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)/a-8*a*Unintegrable(1/x^2/(a^2*c*x^2+c)^
(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x^3*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (6*Defer[Int][1/(x^4*(
c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x])/a - 8*a*Defer[Int][1/(x^2*(c +
 a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{acx^3\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{6\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(8a)\int$$

Mathematica [A] time = 17.23, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.95, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c\, x^{2}+c\right)^{\frac{3}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1032 $\int \frac{1}{x^4(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=100

$$-\frac{8\text{Int}\left(\frac{1}{x^5(a^2cx^2+c)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-10a\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{2}{acx^4\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c/x^4/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)-8*Unintegrable(1/x^5/(a^2*
c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)/a-10*a*Unintegrable(1/x^3/(a^2*c*x^2+c)
^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.36, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x^4*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (8*Defer[Int][1/(x^5*(
c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x])/a - 10*a*Defer[Int][1/(x^3*(c
+ a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{acx^4\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{8\int \frac{1}{x^5(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(10a)\int$$

Mathematica [A] time = 19.47, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [**A**] time = 7.95, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1033 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)^{3/2}},x\right)$$

[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]

[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)), x]

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Mathematica [A] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)), x]

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^{\frac{3}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*x)^(3/2)), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 3.07, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right)^{\frac{5}{2}} \arctan\left(ax\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{\mathrm{atan}\left(a\, x\right)^{3/2}\, {\left(c\, a^2\, x^2 + c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1034 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=160

$$-\frac{2x^3}{ac\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{3\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 3/2*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+
1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-1/2*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a
*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-2
*x^3/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.43, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.231, Rules used = {4942, 4971, 4970, 4406, 3304, 3352}

$$\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{3\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{a^2cx^2+c}}-\frac{2x^3}{ac\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^3)/(a*c*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) + (3*Sqrt[Pi/2]*Sqrt
[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^4*c^2*Sqrt[c + a^2
*c*x^2]) - (Sqrt[(3*Pi)/2]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTa
n[a*x]]])/(a^4*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x^3}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{6\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}$$

$$= -\frac{2x^3}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(6\sqrt{1+a^2x^2}\right)\int \frac{x^2}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{ac^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^3}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(6\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \frac{\cos(x)\sin^2(x)}{\sqrt{x}}\,dx,x,\mathrm{ta}\right.}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^3}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(6\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \left(\frac{\cos(x)}{4\sqrt{x}}-\frac{\cos(3x)}{4\sqrt{x}}\right)dx\right.}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^3}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \frac{\cos(x)}{\sqrt{x}}\,dx,x,\tan^{-1}(a\right.}{2a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^3}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(3\sqrt{1+a^2x^2}\right)\mathrm{Subst}\left(\int \cos\left(x^2\right)dx,x,\sqrt{\mathrm{ta}}\right.}{a^4c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^3}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{c+a^2cx^2}}-\ldots$$

Mathematica [C] time = 0.55, size = 182, normalized size = 1.14

$$\frac{-\frac{8a^3cx^3}{a^2x^2+1}-ic\sqrt{a^2x^2+1}\left(3\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)-3\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+\sqrt{3}\left(\sqrt{i\tan^{-1}(ax}\right.\right.}{4a^4c^3\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] ((-8*a^3*c*x^3)/(1 + a^2*x^2) - I*c*Sqrt[1 + a^2*x^2]*(3*Sqrt[(-I)*ArcTan[a
*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] - 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcT
an[a*x]] + Sqrt[3]*(-(Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]]
```

```
) + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])))/(4*a^4*c^3*Sqrt[c
+ a^2*c*x^2]*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 9.16, size = 0, normalized size = 0.00

$$\int \frac{x^{3}}{\left(a^{2} c\,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{{\mathrm{atan}\left(a\,x\right)}^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^3/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1035 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=281

$$-\frac{2x^2}{ac\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{2}{3}}\cdots}{}$$

```
[Out] 1/2*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+
1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)-1/2*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a
*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)-2
*x^2/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.67, antiderivative size = 281, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 7, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.269, Rules used = {4968, 4971, 4970, 3312, 3305, 3351, 4406}

$$\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2\sqrt{a^2cx^2+c}}-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{2\pi}{3}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2\sqrt{a^2cx^2+c}}\cdots$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x^2)/(a*c*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) - (3*Sqrt[Pi/2]*Sqrt
[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^3*c^2*Sqrt[c + a^2
*c*x^2]) + (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*
x]]])/(a^3*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*Fresnel
S[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a^3*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[(2*P
i)/3]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a^3*c^2*Sq
rt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x^2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{4\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(2a)\int \frac{}{(c+}$$

$$= -\frac{2x^2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\left(4\sqrt{1+a^2x^2}\right)\int \frac{x}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{ac^2\sqrt{c+a^2cx^2}}-$$

$$= -\frac{2x^2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\sin^3(x)}{\sqrt{x}}\,dx,x,\tan^{-}\right.}{a^3c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \left(\frac{3\sin(x)}{4\sqrt{x}}-\frac{\sin(3x)}{4\sqrt{x}}\right.\right.}{a^3c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\sin(3x)}{\sqrt{x}}\,dx,x,\tan^{-1}(a\right.}{2a^3c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \sin\left(3x^2\right)\,dx,x,\sqrt{\text{ta}}\right.}{a^3c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x^2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2\sqrt{c+a^2cx^2}}+$$

Mathematica [C] time = 0.53, size = 241, normalized size = 0.86

$$\frac{\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}\left(S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-3\sqrt{3}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)\right)-\frac{12a^2x^2}{\sqrt{\tan^{-1}(ax)}}-\frac{\left(a^2x^2+1\right)^{3/2}\left(3\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan\right.\right.}{}}{6a^3c\left(a^2cx^2+c\right)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] ((-12*a^2*x^2)/Sqrt[ArcTan[a*x]] + Sqrt[6*Pi]*(1 + a^2*x^2)^(3/2)*(-3*Sqrt[
3]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan
[a*x]]]) - ((1 + a^2*x^2)^(3/2)*(3*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*A
rcTan[a*x]] + 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(Sq
rt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]*G
amma[1/2, (3*I)*ArcTan[a*x]])))/Sqrt[ArcTan[a*x]])/(6*a^3*c*(c + a^2*c*x^2)
^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 9.17, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^2/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
[Out] Timed out
```

3.1036 $\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=280

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{2\pi}{3}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right.}{a^2c^2\sqrt{a^2cx^2+c}}$$

```
[Out] 1/2*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+
1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)+1/2*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a
*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)-2
*x/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.55, antiderivative size = 280, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 9, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.375, Rules used = {4968, 4971, 4970, 4406, 3304, 3352, 4905, 4904, 3312}

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^2\sqrt{a^2cx^2+c}}+\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{\frac{2\pi}{3}}\sqrt{a^2x^2+1}\,\text{Fr}}{a^2c}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-2*x)/(a*c*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) + (3*Sqrt[Pi/2]*Sqrt[1
 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*c^2*Sqrt[c + a^2*c
*x^2]) - (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]
]])/(a^2*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[Pi/6]*Sqrt[1 + a^2*x^2]*FresnelC[
Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[(2*Pi)
/3]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*c^2*Sqrt
[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2x}{ac(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{2\int \frac{1}{(c+a^2cx^2)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a} - (4a)\int \frac{}{(c+a^2}$$

$$= -\frac{2x}{ac(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{\left(2\sqrt{1+a^2x^2}\right)\int \frac{1}{(1+a^2x^2)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{ac^2\sqrt{c+a^2cx^2}} - \frac{(4}{}$$

$$= -\frac{2x}{ac(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \frac{\cos^3(x)}{\sqrt{x}}\,dx, x, \tan^{-1}(\right.}{a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x}{ac(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{\left(2\sqrt{1+a^2x^2}\right)\text{Subst}\left(\int \left(\frac{3\cos(x)}{4\sqrt{x}} + \frac{\cos(3x)}{4\sqrt{x}}\right) d\right.}{a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x}{ac(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \frac{\cos(3x)}{\sqrt{x}}\,dx, x, \tan^{-1}(ax)\right)}{2a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x}{ac(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{\sqrt{1+a^2x^2}\,\text{Subst}\left(\int \cos(3x^2)\,dx, x, \sqrt{\tan^{-}}\right.}{a^2c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2x}{ac(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^2\sqrt{c+a^2cx^2}} - \frac{\sqrt{2}}{}$$

Mathematica [C] time = 0.50, size = 299, normalized size = 1.07

$$-\frac{i\left(a^2x^2\sqrt{3a^2x^2+3}\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-3i\tan^{-1}(ax)\right) - a^2x^2\sqrt{3a^2x^2+3}\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},3i\tan^{-1}(ax)\right) + (a^2x\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] ((-1/4*I)*((-8*I)*a*x + (1 + a^2*x^2)^(3/2)*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/
2, (-I)*ArcTan[a*x]] - (1 + a^2*x^2)^(3/2)*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I
*ArcTan[a*x]] + Sqrt[3 + 3*a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I
)*ArcTan[a*x]] + a^2*x^2*Sqrt[3 + 3*a^2*x^2]*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1
/2, (-3*I)*ArcTan[a*x]] - Sqrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamma[1/2
, (3*I)*ArcTan[a*x]] - a^2*x^2*Sqrt[3 + 3*a^2*x^2]*Sqrt[I*ArcTan[a*x]]*Gamm
a[1/2, (3*I)*ArcTan[a*x]]))/(a^2*c^2*(1 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*Sqrt
[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 3.36, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1037 $\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=157

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{3\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}-\frac{2}{ac\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -3/2*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)-1/2*FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*
x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)-2/a/
c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.27, antiderivative size = 157, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.261$, Rules used = {4902, 4971, 4970, 4406, 3305, 3351}

$$-\frac{3\sqrt{\frac{\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{\frac{3\pi}{2}}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}-\frac{2}{ac\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) - (3*Sqrt[Pi/2]*Sqrt[1 + a
^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a*c^2*Sqrt[c + a^2*c*x^2])
 - (Sqrt[(3*Pi)/2]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]]
)/(a*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - (6a)\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx$$

$$= -\frac{2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(6a\sqrt{1+a^2x^2}\right)\int \frac{x}{\left(1+a^2x^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{c^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(6\sqrt{1+a^2x^2}\right)\operatorname{Subst}\left(\int \frac{\cos^2(x)\sin(x)}{\sqrt{x}}\,dx, x,\right.}{ac^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(6\sqrt{1+a^2x^2}\right)\operatorname{Subst}\left(\int \left(\frac{\sin(x)}{4\sqrt{x}}+\frac{\sin(3x)}{4\sqrt{x}}\right)\right.}{ac^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(3\sqrt{1+a^2x^2}\right)\operatorname{Subst}\left(\int \frac{\sin(x)}{\sqrt{x}}\,dx, x, \tan^{-1}\right.}{2ac^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(3\sqrt{1+a^2x^2}\right)\operatorname{Subst}\left(\int \sin\left(x^2\right)\,dx, x, \sqrt{\right.}{ac^2\sqrt{c+a^2cx^2}}$$

$$= -\frac{2}{ac\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{3\sqrt{\frac{\pi}{2}}\sqrt{1+a^2x^2}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{c+a^2cx^2}} - \cdots$$

Mathematica [C] time = 0.40, size = 158, normalized size = 1.01

$$\frac{-8+\left(a^2x^2+1\right)^{3/2}\left(3\sqrt{-i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+3\sqrt{i\tan^{-1}(ax)}\,\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+\sqrt{3}\left(\sqrt{-i\tan^{-1}(ax}\right.\right.}{4ac\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] (-8 + (1 + a^2*x^2)^(3/2)*(3*Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[
a*x]] + 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(Sqrt[(-I
)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[1
/2, (3*I)*ArcTan[a*x]])))/(4*a*c*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]])
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.65, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1038 $\int \frac{1}{x(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=186

$$-\frac{2\mathrm{Int}\left(\frac{1}{x^2(a^2cx^2+c)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{6\sqrt{2\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}-\frac{2\sqrt{\frac{2\pi}{3}}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -2/3*FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2
+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-6*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(
1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)-2/a/c/x/(a
^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)-2*Unintegrable(1/x^2/(a^2*c*x^2+c)^(5/2
)/arctan(a*x)^(1/2),x)/a
```

Rubi [A] time = 0.40, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) - (6*Sqrt[2*Pi]*Sqrt[1 +
 a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(c^2*Sqrt[c + a^2*c*x^2])
 - (2*Sqrt[(2*Pi)/3]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]
]])/(c^2*Sqrt[c + a^2*c*x^2]) - (2*Defer[Int][1/(x^2*(c + a^2*c*x^2)^(5/2)*
Sqrt[ArcTan[a*x]]), x])/a
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx = -\frac{2}{acx\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a} - (8a)\int \frac{}{(c}$$

$$= -\frac{2}{acx\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a} - \frac{\left(8a\sqrt{1+}\right.}{}$$

$$= -\frac{2}{acx\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a} - \frac{\left(8\sqrt{1+a^2}\right.}{}$$

$$= -\frac{2}{acx\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a} - \frac{\left(8\sqrt{1+a^2}\right.}{}$$

$$= -\frac{2}{acx\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a} - \frac{\left(2\sqrt{1+a^2}\right.}{}$$

$$= -\frac{2}{acx\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a} - \frac{\left(4\sqrt{1+a^2}\right.}{}$$

$$= -\frac{2}{acx\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{6\sqrt{2\pi}\sqrt{1+a^2x^2}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{c^2\sqrt{c+a^2cx^2}} -$$

Mathematica [A] time = 5.75, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.72, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1039 $\int \frac{1}{x^2(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=100

$$-10a\text{Int}\left(\frac{1}{x(a^2cx^2+c)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{4\text{Int}\left(\frac{1}{x^3(a^2cx^2+c)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{acx^2(a^2cx^2+c)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)-4*Unintegrable(1/x^3/(a^2*
c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)/a-10*a*Unintegrable(1/x/(a^2*c*x^2+c)^(
5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) - (4*Defer[Int][1/(x^3
*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x])/a - 10*a*Defer[Int][1/(x*(c
+ a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^2(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{acx^2(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{4\int \frac{1}{x^3(c+a^2cx^2)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(10a)\int$$

Mathematica [A] time = 15.63, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.91, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2 \left(a^2 c\, x^2+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
[Out] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima"
)
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\, \mathrm{atan}\left(a\,x\right)^{3/2}\, {\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(1/(x^2*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
[Out] Timed out
```

3.1040 $\int \frac{1}{x^3(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=100

$$-12a\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{6\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-\frac{2}{acx^3\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)-6*Unintegrable(1/x^4/(a^2*
c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)/a-12*a*Unintegrable(1/x^2/(a^2*c*x^2+c)
^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.36, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x^3*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) - (6*Defer[Int][1/(x^4
*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x])/a - 12*a*Defer[Int][1/(x^2*(
c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{acx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{6\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(12a)\int$$

Mathematica [A] time = 26.78, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.90, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
```

```
[Out] Timed out
```

3.1041 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$

Optimal. Leaf size=100

$$-\frac{8\text{Int}\left(\frac{1}{x^5\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a}-14a\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{2}{acx^4\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/a/c/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)-8*Unintegrable(1/x^5/(a^2*
c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)/a-14*a*Unintegrable(1/x^3/(a^2*c*x^2+c)
^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.37, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] -2/(a*c*x^4*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) - (8*Defer[Int][1/(x^5
*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x])/a - 14*a*Defer[Int][1/(x^3*(
c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx=-\frac{2}{acx^4\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{8\int \frac{1}{x^5\left(c+a^2cx^2\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\,dx}{a}-(14a)\int$$

Mathematica [A] time = 22.27, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(3/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 7.94, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(a^2 c\,x^2+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
[Out] int(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(3/2),x, algorithm="maxima"
)
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,\mathrm{atan}\left(a\,x\right)^{3/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(1/(x^4*atan(a*x)^(3/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(3/2),x)
[Out] Timed out
```

3.1042 $\int \frac{x^m(c+a^2cx^2)}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=25

$$\mathrm{Int}\left(\frac{x^m\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 2.19, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\left(a^2cx^2+c\right)x^m}{\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)*x^m/arctan(a*x)^(5/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.99, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)}{\arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2))/atan(a*x)^(5/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2))/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1043 $\int \frac{x(c+a^2cx^2)}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 2.80, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x*(c + a^2*c*x^2))/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.73, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2}c\,x^{2}+c\right)}{\arctan\left(ax\right)^{\frac{5}{2}}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\left(c\,a^2\,x^2+c\right)}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2))/atan(a*x)^(5/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2))/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c\left(\int \frac{x}{\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}\, dx + \int \frac{a^{2}x^{3}}{\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)/atan(a*x)**(5/2),x)
```

```
[Out] c*(Integral(x/atan(a*x)**(5/2), x) + Integral(a**2*x**3/atan(a*x)**(5/2), x
))
```

3.1044 $\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=22

$$\text{Int}\left(\frac{a^2cx^2+c}{\tan^{-1}(ax)^{5/2}},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)/arctan(a*x)^(5/2),x)

Rubi [A] time = 0.01, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)/ArcTan[a*x]^(5/2),x]

[Out] Defer[Int][(c + a^2*c*x^2)/ArcTan[a*x]^(5/2), x]

Rubi steps

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 2.15, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^(5/2),x]

[Out] Integrate[(c + a^2*c*x^2)/ArcTan[a*x]^(5/2), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="giac")

[Out] Timed out

maple [A] time = 1.55, size = 0, normalized size = 0.00

$$\int \frac{a^{2} c\,x^{2}+c}{\arctan\left(a x\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.05

$$\int \frac{c\,a^2\,x^2+c}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/atan(a*x)^(5/2),x)
```

```
[Out] int((c + a^2*c*x^2)/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{a^{2} x^{2}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{1}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/atan(a*x)**(5/2),x)
```

```
[Out] c*(Integral(a**2*x**2/atan(a*x)**(5/2), x) + Integral(atan(a*x)**(-5/2), x)
)
```

3.1045 $\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{a^2cx^2+c}{x\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)/x/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)/(x*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][(c + a^2*c*x^2)/(x*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 5.98, size = 0, normalized size = 0.00

$$\int \frac{c+a^2cx^2}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[(c + a^2*c*x^2)/(x*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 3.02, size = 0, normalized size = 0.00

$$\int \frac{a^{2} c \,x^{2}+c}{x \arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)/x/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)/x/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)/x/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{c\,a^2\,x^2+c}{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)/(x*atan(a*x)^(5/2)),x)
```

```
[Out] int((c + a^2*c*x^2)/(x*atan(a*x)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c \left(\int \frac{1}{x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{2} x}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)/x/atan(a*x)**(5/2),x)
```

```
[Out] c*(Integral(1/(x*atan(a*x)**(5/2)), x) + Integral(a**2*x/atan(a*x)**(5/2),
x))
```

3.1046 $\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.54, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)x^m}{\arctan(ax)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*x^m/arctan(a*x)^(5/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 4.30, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{2}}{\arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^(5/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^2)/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1047 $\int \frac{x(c+a^2cx^2)^2}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 2.17, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x*(c + a^2*c*x^2)^2)/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 2.25, size = 0, normalized size = 0.00

$$\int \frac{x\left(a^{2} c\, x^{2}+c\right)^{2}}{\arctan \left(a x\right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^2}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^(5/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^2)/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{x}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x^{3}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{5}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] c**2*(Integral(x/atan(a*x)**(5/2), x) + Integral(2*a**2*x**3/atan(a*x)**(5/
2), x) + Integral(a**4*x**5/atan(a*x)**(5/2), x))
```

3.1048 $\int \frac{(c+a^2cx^2)^2}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=24

$$\mathrm{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^2/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^2/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.99, size = 0, normalized size = 0.00

$$\int \frac{\left(a^2 c\, x^2 + c\right)^2}{\arctan\left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\, a^2\, x^2 + c\right)^2}{\mathrm{atan}\left(a\, x\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/atan(a*x)^(5/2),x)
```

```
[Out] int((c + a^2*c*x^2)^2/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^2 \left(\int \frac{2a^2x^2}{\mathrm{atan}^{\frac{5}{2}}\left(ax\right)}\, dx + \int \frac{a^4x^4}{\mathrm{atan}^{\frac{5}{2}}\left(ax\right)}\, dx + \int \frac{1}{\mathrm{atan}^{\frac{5}{2}}\left(ax\right)}\, dx \right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] c**2*(Integral(2*a**2*x**2/atan(a*x)**(5/2), x) + Integral(a**4*x**4/atan(a
*x)**(5/2), x) + Integral(atan(a*x)**(-5/2), x))
```

3.1049 $\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^2}{x\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^2/x/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 3.24, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^2}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^2/(x*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.74, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\, x^{2}+c\right)^{2}}{x \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^2/x/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^2/x/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^2/x/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^2}{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^2/(x*atan(a*x)^(5/2)),x)
```

```
[Out] int((c + a^2*c*x^2)^2/(x*atan(a*x)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{2} \left(\int \frac{1}{x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{2 a^{2} x}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{4} x^{3}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**2/x/atan(a*x)**(5/2),x)
```

```
[Out] c**2*(Integral(1/(x*atan(a*x)**(5/2)), x) + Integral(2*a**2*x/atan(a*x)**(5
/2), x) + Integral(a**4*x**3/atan(a*x)**(5/2), x))
```

3.1050 $\int \frac{x^m(c+a^2cx^2)^3}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 0.94, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.80, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)x^m}{\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*x^m/arctan(a*x
)^(5/2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

[Out] sage0*x

maple [A] time = 4.54, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{3}}{\arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)

[Out] int(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")

[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima: expt: undefined: 0 to a negative exponent.

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^3}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^(5/2),x)

[Out] int((x^m*(c + a^2*c*x^2)^3)/atan(a*x)^(5/2), x)

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**m*(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)

[Out] Timed out

3.1051 $\int \frac{x(c+a^2cx^2)^3}{\tan^{-1}(ax)^{5/2}} dx$

Optimal. Leaf size=25

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^3}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}} dx = \int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}} dx$$

Mathematica [A] time = 2.23, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^3}{\tan^{-1}(ax)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(x*(c + a^2*c*x^2)^3)/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.84, size = 0, normalized size = 0.00

$$\int \frac{x \left(a^{2} c \,x^{2}+c \right)^{3}}{\arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^3}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^(5/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^3)/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{x}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x^{3}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{5}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{7}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] c**3*(Integral(x/atan(a*x)**(5/2), x) + Integral(3*a**2*x**3/atan(a*x)**(5/
2), x) + Integral(3*a**4*x**5/atan(a*x)**(5/2), x) + Integral(a**6*x**7/ata
n(a*x)**(5/2), x))
```

3.1052 $\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=24

$$\text{Int}\left(\frac{(a^2cx^2+c)^3}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{5/2}}\,dx = \int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.67, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^3}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.50, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c\,x^{2}+c\right)^{3}}{\arctan\left(a x\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\left(c\,a^2\,x^2+c\right)^3}{\mathrm{atan}\left(a\,x\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/atan(a*x)^(5/2),x)
```

```
[Out] int((c + a^2*c*x^2)^3/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3}\left(\int \frac{3a^{2}x^{2}}{\operatorname{atan}^{\frac{5}{2}}\left(ax\right)}\,dx+\int \frac{3a^{4}x^{4}}{\operatorname{atan}^{\frac{5}{2}}\left(ax\right)}\,dx+\int \frac{a^{6}x^{6}}{\operatorname{atan}^{\frac{5}{2}}\left(ax\right)}\,dx+\int \frac{1}{\operatorname{atan}^{\frac{5}{2}}\left(ax\right)}\,dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] c**3*(Integral(3*a**2*x**2/atan(a*x)**(5/2), x) + Integral(3*a**4*x**4/atan
(a*x)**(5/2), x) + Integral(a**6*x**6/atan(a*x)**(5/2), x) + Integral(atan(
a*x)**(-5/2), x))
```

3.1053 $\int \frac{(c+a^2cx^2)^3}{x\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^3}{x\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^3/x/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 4.07, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^3}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^3/(x*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.41, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{3}}{x \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^3/x/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^3/x/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^3/x/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^3}{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^3/(x*atan(a*x)^(5/2)),x)
```

```
[Out] int((c + a^2*c*x^2)^3/(x*atan(a*x)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$c^{3} \left(\int \frac{1}{x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{2} x}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{3 a^{4} x^{3}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx + \int \frac{a^{6} x^{5}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**3/x/atan(a*x)**(5/2),x)
```

```
[Out] c**3*(Integral(1/(x*atan(a*x)**(5/2)), x) + Integral(3*a**2*x/atan(a*x)**(5
/2), x) + Integral(3*a**4*x**3/atan(a*x)**(5/2), x) + Integral(a**6*x**5/at
an(a*x)**(5/2), x))
```

3.1054 $\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=50

$$\frac{2m\text{Int}\left(\frac{x^{m-1}}{\tan^{-1}(ax)^{3/2}},x\right)}{3ac}-\frac{2x^m}{3ac\tan^{-1}(ax)^{3/2}}$$

```
[Out] -2/3*x^m/a/c/arctan(a*x)^(3/2)+2/3*m*Unintegrable(x^(-1+m)/arctan(a*x)^(3/2
),x)/a/c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^m)/(3*a*c*ArcTan[a*x]^(3/2)) + (2*m*Defer[Int][x^(-1 + m)/ArcTan[a*x]
^(3/2), x])/(3*a*c)
```

Rubi steps

$$\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2x^m}{3ac\tan^{-1}(ax)^{3/2}}+\frac{(2m)\int \frac{x^{-1+m}}{\tan^{-1}(ax)^{3/2}}\,dx}{3ac}$$

Mathematica [A] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[x^m/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)), x]
```

fricas [A] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{(a^2cx^2+c)\arctan(ax)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(x^m/((a^2*c*x^2 + c)*arctan(a*x)^(5/2)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.47, size = 0, normalized size = 0.00

$$\int \frac{x^m}{(a^2 c x^2 + c) \arctan(ax)^{\frac{5}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^m}{\mathrm{atan}(a\,x)^{5/2}\,(c\,a^2\,x^2 + c)} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1055 $\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=41

$$\frac{2\text{Int}\left(\frac{1}{\tan^{-1}(ax)^{3/2}},x\right)}{3ac}-\frac{2x}{3ac\tan^{-1}(ax)^{3/2}}$$

```
[Out] -2/3*x/a/c/arctan(a*x)^(3/2)+2/3*Unintegrable(1/arctan(a*x)^(3/2),x)/a/c
```

Rubi [A] time = 0.05, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x)/(3*a*c*ArcTan[a*x]^(3/2)) + (2*Defer[Int][ArcTan[a*x]^(-3/2), x])/(3
*a*c)
```

Rubi steps

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2x}{3ac\tan^{-1}(ax)^{3/2}}+\frac{2\int \frac{1}{\tan^{-1}(ax)^{3/2}}\,dx}{3ac}$$

Mathematica [A] time = 1.55, size = 0, normalized size = 0.00

$$\int \frac{x}{(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[x/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.37, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c\,x^{2}+c\right) \arctan \left(a x\right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
[Out] int(x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x}{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)),x)
[Out] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^{2} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)/atan(a*x)**(5/2),x)
[Out] Integral(x/(a**2*x**2*atan(a*x)**(5/2) + atan(a*x)**(5/2)), x)/c
```

3.1056 $\int \frac{1}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=18

$$-\frac{2}{3ac\tan^{-1}(ax)^{3/2}}$$

```
[Out] -2/3/a/c/arctan(a*x)^(3/2)
```

Rubi [A] time = 0.02, antiderivative size = 18, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.048, Rules used = {4884}

$$-\frac{2}{3ac\tan^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*ArcTan[a*x]^(3/2))
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac\tan^{-1}(ax)^{3/2}}$$

Mathematica [A] time = 0.01, size = 18, normalized size = 1.00

$$-\frac{2}{3ac\tan^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[1/((c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*ArcTan[a*x]^(3/2))
```

fricas [A] time = 0.49, size = 14, normalized size = 0.78

$$-\frac{2}{3\,ac\arctan\left(ax\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] -2/3/(a*c*arctan(a*x)^(3/2))
```

giac [A] time = 0.14, size = 14, normalized size = 0.78

$$-\frac{2}{3\,ac\arctan\left(ax\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] -2/3/(a*c*arctan(a*x)^(3/2))
```

maple [A] time = 0.17, size = 15, normalized size = 0.83

$$-\frac{2}{3ac\arctan\left(ax\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

```
[Out] -2/3/a/c/arctan(a*x)^(3/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 0.33, size = 14, normalized size = 0.78

$$-\frac{2}{3\,a\,c\,\mathrm{atan}\left(a\,x\right)^{3/2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)),x)
```

```
[Out] -2/(3*a*c*atan(a*x)^(3/2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\begin{cases} -\frac{2}{3ac\operatorname{atan}^{\frac{3}{2}}\left(ax\right)} & \text{for}\ c \neq 0 \\ \tilde{\infty}\int\frac{1}{\operatorname{atan}^{\frac{5}{2}}\left(ax\right)}\,dx & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)/atan(a*x)**(5/2),x)
```

```
[Out] Piecewise((-2/(3*a*c*atan(a*x)**(3/2)), Ne(c, 0)), (zoo*Integral(atan(a*x)*
*(-5/2), x), True))
```

3.1057 $\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=47

$$-\frac{2\text{Int}\left(\frac{1}{x^2\tan^{-1}(ax)^{3/2}},x\right)}{3ac}-\frac{2}{3acx\tan^{-1}(ax)^{3/2}}$$

```
[Out] -2/3/a/c/x/arctan(a*x)^(3/2)-2/3*Unintegrable(1/x^2/arctan(a*x)^(3/2),x)/a/
c
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x*ArcTan[a*x]^(3/2)) - (2*Defer[Int][1/(x^2*ArcTan[a*x]^(3/2)), x
])/(3*a*c)
```

Rubi steps

$$\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2}{3acx\tan^{-1}(ax)^{3/2}}-\frac{2\int \frac{1}{x^2\tan^{-1}(ax)^{3/2}}\,dx}{3ac}$$

Mathematica [A] time = 1.43, size = 0, normalized size = 0.00

$$\int \frac{1}{x(c+a^2cx^2)\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x*(c + a^2*c*x^2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.45, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2} c\,x^{2}+c\right) \arctan\left(a x\right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{5/2}\,\left(c\,a^2\,x^2+c\right)} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{2} x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**2*x**3*atan(a*x)**(5/2) + x*atan(a*x)**(5/2)), x)/c
```

3.1058 $\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^2 \tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx = \int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$$

Mathematica [A] time = 1.24, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)), x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral(x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arctan(a*x)^(5/2)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

[Out] Timed out

maple [A] time = 2.71, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right)^2 \arctan\left(ax\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\, x\right)^{5/2} \left(c\, a^2\, x^2 + c\right)^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1059 $\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=186

$$\frac{8}{3}a^2\text{Int}\left(\frac{x^5}{\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)+\frac{16}{3}\text{Int}\left(\frac{x^3}{\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)+\frac{4\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^4c^2}-\frac{4x}{a^2c^2\left(a^2x^2+1\right.}$$

```
[Out] -2/3*x^3/a/c^2/(a^2*x^2+1)/arctan(a*x)^(3/2)+4*FresnelS(2*arctan(a*x)^(1/2)
/Pi^(1/2))*Pi^(1/2)/a^4/c^2-4*x^2/a^2/c^2/(a^2*x^2+1)/arctan(a*x)^(1/2)-4/3
*x^4/c^2/(a^2*x^2+1)/arctan(a*x)^(1/2)+16/3*Unintegrable(x^3/(a^2*c*x^2+c)^
2/arctan(a*x)^(1/2),x)+8/3*a^2*Unintegrable(x^5/(a^2*c*x^2+c)^2/arctan(a*x)
^(1/2),x)
```

Rubi [A] time = 0.42, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^3)/(3*a*c^2*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) - (4*x^2)/(a^2*c^2*(1 +
a^2*x^2)*Sqrt[ArcTan[a*x]]) - (4*x^4)/(3*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]
]) + (4*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(a^4*c^2) + (16*
Defer[Int][x^3/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/3 + (8*a^2*Defer[
Int][x^5/((c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x^3}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{2\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx}{a} + \frac{1}{3}(2a)\int \frac{}{\left(c+\right.}$$

$$= -\frac{2x^3}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{4}{3c^2\left(1+a^2x^{\cdot}\right.}$$

$$= -\frac{2x^3}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{4}{3c^2\left(1+a^2x^{\cdot}\right.}$$

$$= -\frac{2x^3}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{4}{3c^2\left(1+a^2x^{\cdot}\right.}$$

$$= -\frac{2x^3}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{4}{3c^2\left(1+a^2x^{\cdot}\right.}$$

$$= -\frac{2x^3}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{4}{3c^2\left(1+a^2x^{\cdot}\right.}$$

$$= -\frac{2x^3}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{4}{3c^2\left(1+a^2x^{\cdot}\right.}$$

Mathematica [A] time = 4.81, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[x^3/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{x^{3}}{\left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^{3}}{a^{4} x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 2 a^{2} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(x**3/(a**4*x**4*atan(a*x)**(5/2) + 2*a**2*x**2*atan(a*x)**(5/2) +
atan(a*x)**(5/2)), x)/c**2
```

3.1060 $\int \frac{x^2}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=180

$$\frac{8\sqrt{\pi}\, C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^3c^2}+\frac{16\sqrt{\tan^{-1}(ax)}}{3a^3c^2}-\frac{2x^2}{3ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}+\frac{16\left(1-a^2\right.}{3a^3c^2}$$

```
[Out] -2/3*x^2/a/c^2/(a^2*x^2+1)/arctan(a*x)^(3/2)+8/3*FresnelC(2*arctan(a*x)^(1/
2)/Pi^(1/2))*Pi^(1/2)/a^3/c^2-8/3*x/a^2/c^2/(a^2*x^2+1)/arctan(a*x)^(1/2)+1
6/3*arctan(a*x)^(1/2)/a^3/c^2-32/3*arctan(a*x)^(1/2)/a^3/c^2/(a^2*x^2+1)+16
/3*(-a^2*x^2+1)*arctan(a*x)^(1/2)/a^3/c^2/(a^2*x^2+1)
```

Rubi [A] time = 0.26, antiderivative size = 180, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4942, 4932, 4930, 4904, 3312, 3304, 3352}

$$\frac{8\sqrt{\pi}\,\text{FresnelC}\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^3c^2}-\frac{2x^2}{3ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}+\frac{16\left(1-a^2x^2\right)\sqrt{\tan}}{3a^3c^2\left(a^2x^2+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^2)/(3*a*c^2*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) - (8*x)/(3*a^2*c^2*(1 +
a^2*x^2)*Sqrt[ArcTan[a*x]]) + (16*Sqrt[ArcTan[a*x]])/(3*a^3*c^2) - (32*Sqrt
[ArcTan[a*x]])/(3*a^3*c^2*(1 + a^2*x^2)) + (16*(1 - a^2*x^2)*Sqrt[ArcTan[a*
x]])/(3*a^3*c^2*(1 + a^2*x^2)) + (8*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])
/Sqrt[Pi]])/(3*a^3*c^2)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4932

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*(x_))/((d_) + (e_.)*(x_)^2)^2,
 x_Symbol] :> Simp[(x*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p + 1)*(d + e*x^
2)), x] + (-Dist[4/(b^2*(p + 1)*(p + 2)), Int[(x*(a + b*ArcTan[c*x])^(p + 2
))/(d + e*x^2)^2, x], x] - Simp[((1 - c^2*x^2)*(a + b*ArcTan[c*x])^(p + 2))
/(b^2*e*(p + 1)*(p + 2)*(d + e*x^2)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[p, -1] && NeQ[p, -2]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}+\frac{4\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx}{3a}$$

$$= -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{16\left(1-a^2x^2\right)}{3a^3c^2\left(1-\right.}$$

$$= -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{32\sqrt{\tan^{-1}(ax}}{3a^3c^2\left(1+a^2x\right.}$$

$$= -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{32\sqrt{\tan^{-1}(ax}}{3a^3c^2\left(1+a^2x\right.}$$

$$= -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}-\frac{32\sqrt{\tan^{-1}(ax}}{3a^3c^2\left(1+a^2x\right.}$$

$$= -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{16\sqrt{\tan^{-1}(ax)}}{3a^3c^2}$$

$$= -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{16\sqrt{\tan^{-1}(ax)}}{3a^3c^2}$$

$$= -\frac{2x^2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{16\sqrt{\tan^{-1}(ax)}}{3a^3c^2}$$

Mathematica [C] time = 0.37, size = 162, normalized size = 0.90

$$\frac{4\sqrt{\pi}\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+\sqrt{2}\left(a^2x^2+1\right)\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)+\sqrt{2}\left(a^2x^2\right.}{3a^3c^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*a*x*(a*x + 4*ArcTan[a*x]) + 4*Sqrt[Pi]*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)*
FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + Sqrt[2]*(1 + a^2*x^2)*((-I)*ArcT
an[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcTan[a*x]] + Sqrt[2]*(1 + a^2*x^2)*(I*Ar
cTan[a*x])^(3/2)*Gamma[1/2, (2*I)*ArcTan[a*x]])/(3*a^3*c^2*(1 + a^2*x^2)*Ar
cTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.48, size = 62, normalized size = 0.34

$$-\frac{-8\sqrt{\pi}\ \mathrm{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan\left(ax\right)^{\frac{3}{2}}+4\sin\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)-\cos\left(2\arctan\left(ax\right)\right)+1}{3a^3c^2\arctan\left(ax\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] -1/3/a^3/c^2*(-8*Pi^(1/2)*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*arctan(a*x
)^(3/2)+4*sin(2*arctan(a*x))*arctan(a*x)-cos(2*arctan(a*x))+1)/arctan(a*x)^
(3/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\operatorname{atan}(a\,x)^{5/2}\,\left(c\,a^2\,x^2+c\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^4x^4\operatorname{atan}^{\frac{5}{2}}(ax)+2a^2x^2\operatorname{atan}^{\frac{5}{2}}(ax)+\operatorname{atan}^{\frac{5}{2}}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(x**2/(a**4*x**4*atan(a*x)**(5/2) + 2*a**2*x**2*atan(a*x)**(5/2) +
atan(a*x)**(5/2)), x)/c**2
```

3.1061 $\int \frac{x}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} dx$

Optimal. Leaf size=101

$$-\frac{8\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^2c^2}-\frac{2x}{3ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}-\frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/3*x/a/c^2/(a^2*x^2+1)/arctan(a*x)^(3/2)-8/3*FresnelS(2*arctan(a*x)^(1/2)
/Pi^(1/2))*Pi^(1/2)/a^2/c^2-4/3*(-a^2*x^2+1)/a^2/c^2/(a^2*x^2+1)/arctan(a*x
)^(1/2)
```

Rubi [A] time = 0.12, antiderivative size = 101, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4932, 4970, 4406, 12, 3305, 3351}

$$-\frac{8\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^2c^2}-\frac{2x}{3ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}-\frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x)/(3*a*c^2*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) - (4*(1 - a^2*x^2))/(3*a^2
*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - (8*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan
[a*x]])/Sqrt[Pi]])/(3*a^2*c^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4932

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*(x_))/((d_) + (e_.)*(x_)^2)^2,
 x_Symbol] :> Simp[(x*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p + 1)*(d + e*x^
2)), x] + (-Dist[4/(b^2*(p + 1)*(p + 2)), Int[(x*(a + b*ArcTan[c*x])^(p + 2
))/(d + e*x^2)^2, x], x] - Simp[((1 - c^2*x^2)*(a + b*ArcTan[c*x])^(p + 2))
/(b^2*e*(p + 1)*(p + 2)*(d + e*x^2)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
```

```
qQ[e, c^2*d] && LtQ[p, -1] && NeQ[p, -2]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16}{3}\int \frac{\ }{\left(c+a^2c\right.}$$

$$= -\frac{2x}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16\,\mathrm{Subst}\left(\int \frac{\mathrm{co}}{\ }\right.}{\ }$$

$$= -\frac{2x}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16\,\mathrm{Subst}\left(\int \frac{\mathrm{si}}{2}\right.}{\ }$$

$$= -\frac{2x}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{8\,\mathrm{Subst}\left(\int \frac{\sin}{\sqrt{\ }}\right.}{\ }$$

$$= -\frac{2x}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16\,\mathrm{Subst}\left(\int \mathrm{si}\right.}{\ }$$

$$= -\frac{2x}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4\left(1-a^2x^2\right)}{3a^2c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{8\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}}}{\sqrt{\pi}}\right.}{3a^2c^2}$$

Mathematica [A] time = 0.08, size = 88, normalized size = 0.87

$$-\frac{2\left(4\sqrt{\pi}\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+\left(2-2a^2x^2\right)\tan^{-1}(ax)+ax\right)}{3a^2c^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Integrate[x/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*(a*x + (2 - 2*a^2*x^2)*ArcTan[a*x] + 4*Sqrt[Pi]*(1 + a^2*x^2)*ArcTan[a*
x]^(3/2)*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]]))/(3*a^2*c^2*(1 + a^2*x^2
)*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 0.32, size = 59, normalized size = 0.58

$$-\frac{8\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan(ax)^{\frac{3}{2}}+4\cos(2\arctan(ax))\arctan(ax)+\sin(2\arctan(ax))}{3a^2c^2\arctan(ax)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] -1/3/a^2/c^2*(8*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))*arctan(a*x)
^(3/2)+4*cos(2*arctan(a*x))*arctan(a*x)+sin(2*arctan(a*x)))/arctan(a*x)^(3/
2)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^4x^4\,\mathrm{atan}^{\frac{5}{2}}(ax)+2a^2x^2\,\mathrm{atan}^{\frac{5}{2}}(ax)+\mathrm{atan}^{\frac{5}{2}}(ax)}\,dx}{c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(x/(a**4*x**4*atan(a*x)**(5/2) + 2*a**2*x**2*atan(a*x)**(5/2) + ata
n(a*x)**(5/2)), x)/c**2
```

3.1062 $\int \frac{1}{\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=174

$$\frac{8x}{3c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}-\frac{16\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{3ac^2\left(a^2x^2+1\right)}+\frac{32\sqrt{\tan^{-1}(ax)}}{3ac^2\left(a^2x^2+1\right)}-\frac{2}{3ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}-\frac{8\sqrt{\pi}\,C\left(\ldots\right)}{3\ldots}$$

[Out] -2/3/a/c^2/(a^2*x^2+1)/arctan(a*x)^(3/2)-8/3*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/a/c^2+8/3*x/c^2/(a^2*x^2+1)/arctan(a*x)^(1/2)-16/3*arctan(a*x)^(1/2)/a/c^2+32/3*arctan(a*x)^(1/2)/a/c^2/(a^2*x^2+1)-16/3*(-a^2*x^2+1)*arctan(a*x)^(1/2)/a/c^2/(a^2*x^2+1)

Rubi [A] time = 0.21, antiderivative size = 174, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4902, 4932, 4930, 4904, 3312, 3304, 3352}

$$\frac{8x}{3c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}-\frac{16\left(1-a^2x^2\right)\sqrt{\tan^{-1}(ax)}}{3ac^2\left(a^2x^2+1\right)}+\frac{32\sqrt{\tan^{-1}(ax)}}{3ac^2\left(a^2x^2+1\right)}-\frac{2}{3ac^2\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}}-\frac{8\sqrt{\pi}\,\text{Fres}\ldots}{\ldots}$$

Antiderivative was successfully verified.

[In] Int[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]

[Out] -2/(3*a*c^2*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) + (8*x)/(3*c^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) - (16*Sqrt[ArcTan[a*x]])/(3*a*c^2) + (32*Sqrt[ArcTan[a*x]])/(3*a*c^2*(1 + a^2*x^2)) - (16*(1 - a^2*x^2)*Sqrt[ArcTan[a*x]])/(3*a*c^2*(1 + a^2*x^2)) - (8*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(3*a*c^2)

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*FresnelC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && LtQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4930

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)*((d_) + (e_.)*(x_)^2)^(q_
.), x_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^p)/(2*e*(q +
 1)), x] - Dist[(b*p)/(2*c*(q + 1)), Int[(d + e*x^2)^q*(a + b*ArcTan[c*x])^
(p - 1), x], x] /; FreeQ[{a, b, c, d, e, q}, x] && EqQ[e, c^2*d] && GtQ[p,
0] && NeQ[q, -1]
```

Rule 4932

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*(x_))/((d_) + (e_.)*(x_)^2)^2,
 x_Symbol] :> Simp[(x*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p + 1)*(d + e*x^
2)), x] + (-Dist[4/(b^2*(p + 1)*(p + 2)), Int[(x*(a + b*ArcTan[c*x])^(p + 2
))/(d + e*x^2)^2, x], x] - Simp[((1 - c^2*x^2)*(a + b*ArcTan[c*x])^(p + 2))
/(b^2*e*(p + 1)*(p + 2)*(d + e*x^2)), x]) /; FreeQ[{a, b, c, d, e}, x] && E
qQ[e, c^2*d] && LtQ[p, -1] && NeQ[p, -2]
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{1}{3}(4a)\int \frac{x}{\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx$$

$$= -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8x}{3c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16\left(1-a^2x^2\right)}{3ac^2\left(1\right.}$$

$$= -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8x}{3c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{32\sqrt{\tan^{-1}(a}}{3ac^2\left(1+a^2x\right.}$$

$$= -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8x}{3c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{32\sqrt{\tan^{-1}(a}}{3ac^2\left(1+a^2x\right.}$$

$$= -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8x}{3c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{32\sqrt{\tan^{-1}(a}}{3ac^2\left(1+a^2x\right.}$$

$$= -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8x}{3c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16\sqrt{\tan^{-1}(ax}}{3ac^2}$$

$$= -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8x}{3c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16\sqrt{\tan^{-1}(ax}}{3ac^2}$$

$$= -\frac{2}{3ac^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8x}{3c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} - \frac{16\sqrt{\tan^{-1}(ax}}{3ac^2}$$

Mathematica [C] time = 0.44, size = 170, normalized size = 0.98

$$\frac{-4\sqrt{\pi}\left(a^2x^2+1\right)\tan^{-1}(ax)^{3/2}C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)+\frac{\sqrt{2}\left(a^2x^2+1\right)\tan^{-1}(ax)^2\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)}{\sqrt{i\tan^{-1}(ax)}}+\sqrt{2}\left(a^2x^2+1\right)\sqrt{i\tan^{-1}(ax)}\sqrt{}}{3c^2\left(a^3x^2+a\right)\tan^{-1}(ax)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2 + 8*a*x*ArcTan[a*x] - 4*Sqrt[Pi]*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)*Fresne
lC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]] + Sqrt[2]*(1 + a^2*x^2)*Sqrt[I*ArcTan[a*
x]]*Sqrt[ArcTan[a*x]^2]*Gamma[1/2, (-2*I)*ArcTan[a*x]] + (Sqrt[2]*(1 + a^2*
x^2)*ArcTan[a*x]^2*Gamma[1/2, (2*I)*ArcTan[a*x]])/Sqrt[I*ArcTan[a*x]])/(3*c
^2*(a + a^3*x^2)*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.47, size = 62, normalized size = 0.36

$$\frac{-8\sqrt{\pi}\ \mathrm{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan\left(ax\right)^{\frac{3}{2}}+4\sin\left(2\arctan\left(ax\right)\right)\arctan\left(ax\right)-\cos\left(2\arctan\left(ax\right)\right)-1}{3a\,c^2\arctan\left(ax\right)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] 1/3/a/c^2*(-8*Pi^(1/2)*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*arctan(a*x)^(
3/2)+4*sin(2*arctan(a*x))*arctan(a*x)-cos(2*arctan(a*x))-1)/arctan(a*x)^(3/
2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 2 a^{2} x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**4*x**4*atan(a*x)**(5/2) + 2*a**2*x**2*atan(a*x)**(5/2) + ata
n(a*x)**(5/2)), x)/c**2
```

3.1063 $\int \frac{1}{x(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=180

$$\frac{16}{3}\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+\frac{4}{c^2\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}+\frac{}{3a^2c^2x^2\left(a^2x^2 \cdot\right.}$$

```
[Out] -2/3/a/c^2/x/(a^2*x^2+1)/arctan(a*x)^(3/2)+4*FresnelS(2*arctan(a*x)^(1/2)/P
i^(1/2))*Pi^(1/2)/c^2+4/c^2/(a^2*x^2+1)/arctan(a*x)^(1/2)+4/3/a^2/c^2/x^2/(
a^2*x^2+1)/arctan(a*x)^(1/2)+8/3*Unintegrable(1/x^3/(a^2*c*x^2+c)^2/arctan(
a*x)^(1/2),x)/a^2+16/3*Unintegrable(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x
)
```

Rubi [A] time = 0.36, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^2*x*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) + 4/(c^2*(1 + a^2*x^2)*Sqrt[
ArcTan[a*x]]) + 4/(3*a^2*c^2*x^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + (4*Sqrt
[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/c^2 + (8*Defer[Int][1/(x^3*(
c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/(3*a^2) + (16*Defer[Int][1/(x*(c +
 a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac^2x\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx}{3a} - (2a)\int \frac{}{\left(c\right.}$$

$$= -\frac{2}{3ac^2x\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{4}{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^2x^2\left(1\right.}$$

$$= -\frac{2}{3ac^2x\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{4}{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^2x^2\left(1\right.}$$

$$= -\frac{2}{3ac^2x\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{4}{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^2x^2\left(1\right.}$$

$$= -\frac{2}{3ac^2x\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{4}{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^2x^2\left(1\right.}$$

$$= -\frac{2}{3ac^2x\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{4}{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^2x^2\left(1\right.}$$

$$= -\frac{2}{3ac^2x\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{4}{c^2\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^2x^2\left(1\right.}$$

Mathematica [A] time = 4.54, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

[Out] Timed out

maple [A] time = 2.67, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2} c\,x^{2}+c\right)^{2} \arctan\left(a x\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{5} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 2 a^{2} x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**4*x**5*atan(a*x)**(5/2) + 2*a**2*x**3*atan(a*x)**(5/2) + x*a
tan(a*x)**(5/2)), x)/c**2
```

3.1064 $\int \frac{1}{x^2(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}} dx$

Optimal. Leaf size=198

$$\frac{56}{3}\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+\frac{16}{3c^2x\left(a^2x^2+1\right)\sqrt{\tan^{-1}(ax)}}-\frac{}{3ac^2x^2\left(\right.}$$

[Out] -2/3/a/c^2/x^2/(a^2*x^2+1)/arctan(a*x)^(3/2)+8*a*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*Pi^(1/2)/c^2+8/3/a^2/c^2/x^3/(a^2*x^2+1)/arctan(a*x)^(1/2)+16/3/c^2/x/(a^2*x^2+1)/arctan(a*x)^(1/2)+16*a*arctan(a*x)^(1/2)/c^2+8*Unintegrable(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)/a^2+56/3*Unintegrable(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)

Rubi [A] time = 0.48, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]

[Out] -2/(3*a*c^2*x^2*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) + 8/(3*a^2*c^2*x^3*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + 16/(3*c^2*x*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) + (16*a*Sqrt[ArcTan[a*x]])/c^2 + (8*a*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/c^2 + (8*Defer[Int][1/(x^4*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/a^2 + (56*Defer[Int][1/(x^2*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/3

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac^2x^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} - \frac{4\int \frac{1}{x^3\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{3/2}}\,dx}{3a} - \frac{1}{3}(8a)\int -$$

$$= -\frac{2}{3ac^2x^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^2x^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^2x\,(1}$$

$$= -\frac{2}{3ac^2x^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^2x^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^2x\,(1}$$

$$= -\frac{2}{3ac^2x^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^2x^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^2x\,(1}$$

$$= -\frac{2}{3ac^2x^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^2x^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^2x\,(1}$$

$$= -\frac{2}{3ac^2x^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^2x^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^2x\,(1}$$

$$= -\frac{2}{3ac^2x^2\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^2x^3\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^2x\,(1}$$

Mathematica [A] time = 6.88, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^2\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A]   time = 2.40, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{6} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 2 a^{2} x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**4*x**6*atan(a*x)**(5/2) + 2*a**2*x**4*atan(a*x)**(5/2) + x**
2*atan(a*x)**(5/2)), x)/c**2
```

3.1065 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=189

$$\frac{80}{3}a^2\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)+\frac{16\text{Int}\left(\frac{1}{x^5\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+\frac{112}{3}\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right.$$

```
[Out] -2/3/a/c^2/x^3/(a^2*x^2+1)/arctan(a*x)^(3/2)+4/a^2/c^2/x^4/(a^2*x^2+1)/arct
an(a*x)^(1/2)+20/3/c^2/x^2/(a^2*x^2+1)/arctan(a*x)^(1/2)+16*Unintegrable(1/
x^5/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)/a^2+112/3*Unintegrable(1/x^3/(a^2*
c*x^2+c)^2/arctan(a*x)^(1/2),x)+80/3*a^2*Unintegrable(1/x/(a^2*c*x^2+c)^2/a
rctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.46, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^2*x^3*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) + 4/(a^2*c^2*x^4*(1 + a^2*
x^2)*Sqrt[ArcTan[a*x]]) + 20/(3*c^2*x^2*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) +
(16*Defer[Int][1/(x^5*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/a^2 + (112*
Defer[Int][1/(x^3*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/3 + (80*a^2*Def
er[Int][1/(x*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx = -\frac{2}{3ac^2x^3\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{2\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{3/2}} \, dx}{a}-\frac{1}{3}(10a)\int$$

$$=-\frac{2}{3ac^2x^3\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}+\frac{4}{a^2c^2x^4\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{}{3c^2x^2\left(1\right.}$$

Mathematica [A] time = 5.64, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 5.52, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c \,x^{2}+c \right)^{2} \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{7} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 2 a^{2} x^{5} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**4*x**7*atan(a*x)**(5/2) + 2*a**2*x**5*atan(a*x)**(5/2) + x**
3*atan(a*x)**(5/2)), x)/c**2
```

3.1066 $\int \frac{1}{x^4(c+a^2cx^2)^2 \tan^{-1}(ax)^{5/2}} dx$

Optimal. Leaf size=189

$$40a^2\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},x\right)+\frac{80\text{Int}\left(\frac{1}{x^6(a^2cx^2+c)^2\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+\frac{184}{3}\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^2\sqrt{\tan^{-1}(ax)}},\right.$$

```
[Out] -2/3/a/c^2/x^4/(a^2*x^2+1)/arctan(a*x)^(3/2)+16/3/a^2/c^2/x^5/(a^2*x^2+1)/a
rctan(a*x)^(1/2)+8/c^2/x^3/(a^2*x^2+1)/arctan(a*x)^(1/2)+80/3*Unintegrable(
1/x^6/(a^2*c*x^2+c)^2/arctan(a*x)^(1/2),x)/a^2+184/3*Unintegrable(1/x^4/(a^
2*c*x^2+c)^2/arctan(a*x)^(1/2),x)+40*a^2*Unintegrable(1/x^2/(a^2*c*x^2+c)^2
/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.47, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^2*x^4*(1 + a^2*x^2)*ArcTan[a*x]^(3/2)) + 16/(3*a^2*c^2*x^5*(1 + a
^2*x^2)*Sqrt[ArcTan[a*x]]) + 8/(c^2*x^3*(1 + a^2*x^2)*Sqrt[ArcTan[a*x]]) +
(80*Defer[Int][1/(x^6*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/(3*a^2) + (
184*Defer[Int][1/(x^4*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x])/3 + 40*a^2*
Defer[Int][1/(x^2*(c + a^2*c*x^2)^2*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} dx = -\frac{2}{3ac^2x^4\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}-\frac{8\int \frac{1}{x^5(c+a^2cx^2)^2\tan^{-1}(ax)^{3/2}}dx}{3a}-(4a)\int \frac{}{x^3\left(\right.}$$

$$=-\frac{2}{3ac^2x^4\left(1+a^2x^2\right)\tan^{-1}(ax)^{3/2}}+\frac{16}{3a^2c^2x^5\left(1+a^2x^2\right)\sqrt{\tan^{-1}(ax)}}+\frac{}{c^2x^3\left(1\right.}$$

Mathematica [A] time = 11.36, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^2 \tan^{-1}(ax)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^2*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.87, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c\, x^{2}+c\right)^{2} \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^2/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\, \mathrm{atan}\left(a\,x\right)^{5/2}\, {\left(c\,a^2\,x^2+c\right)}^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2),x)
```

```
[Out] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{4} x^{8} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 2 a^{2} x^{6} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**2/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**4*x**8*atan(a*x)**(5/2) + 2*a**2*x**6*atan(a*x)**(5/2) + x**
4*atan(a*x)**(5/2)), x)/c**2
```

3.1067 $\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^3 \tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.06, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}} \, dx = \int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}} \, dx$$

Mathematica [A] time = 1.45, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)), x]
```

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral(x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*x^2 + c^3)*arctan(a*
x)^(5/2)), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.38, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\,x^2+c\right)^3 \arctan\left(a x\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)^{5/2}\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1068 $\int \frac{x^3}{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=160

$$\frac{4\sqrt{2\pi}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^4c^3}-\frac{4\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^4c^3}-\frac{4x^2}{a^2c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}+\frac{4x^4}{3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\cdots$$

```
[Out] -2/3*x^3/a/c^3/(a^2*x^2+1)^2/arctan(a*x)^(3/2)-4/3*FresnelS(2*arctan(a*x)^(
1/2)/Pi^(1/2))*Pi^(1/2)/a^4/c^3+4/3*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)
^(1/2))*2^(1/2)*Pi^(1/2)/a^4/c^3-4*x^2/a^2/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1
/2)+4/3*x^4/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.59, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4968, 4942, 4970, 4406, 3305, 3351}

$$\frac{4\sqrt{2\pi}\, S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^4c^3}-\frac{4\sqrt{\pi}\, S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^4c^3}+\frac{4x^4}{3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2x^3}{3ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}-\cdots$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^3)/(3*a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) - (4*x^2)/(a^2*c^3*(1
+ a^2*x^2)^2*Sqrt[ArcTan[a*x]]) + (4*x^4)/(3*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTa
n[a*x]]) + (4*Sqrt[2*Pi]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(3*a^4*c
^3) - (4*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(3*a^4*c^3)
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x^3}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{2\int \frac{x^2}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx}{a} - \frac{1}{3}(2a)\int \frac{}{(c+}$$

$$= -\frac{2x^3}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+a^2\right.}$$

$$= -\frac{2x^3}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+a^2\right.}$$

$$= -\frac{2x^3}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+a^2\right.}$$

$$= -\frac{2x^3}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+a^2\right.}$$

$$= -\frac{2x^3}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+a^2\right.}$$

$$= -\frac{2x^3}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+a^2\right.}$$

Mathematica [C] time = 0.47, size = 227, normalized size = 1.42

$$i\sqrt{2}\left(a^2x^2+1\right)^2\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\tfrac{1}{2},-2i\tan^{-1}(ax)\right)+\sqrt{2}\left(a^2x^2+1\right)^2\sqrt{i\tan^{-1}(ax)}\,\tan^{-1}(ax)\Gamma\left(\tfrac{1}{2},2i\tan^{-1}(\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (I*Sqrt[2]*(1 + a^2*x^2)^2*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcTa
n[a*x]] + Sqrt[2]*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*ArcTan[a*x]*Gamma[1/2
, (2*I)*ArcTan[a*x]] - 2*(a^2*x^2*(a*x + (6 - 2*a^2*x^2)*ArcTan[a*x]) + I*(
1 + a^2*x^2)^2*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-4*I)*ArcTan[a*x]] + (1
 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*ArcTan[a*x]*Gamma[1/2, (4*I)*ArcTan[a*x]]
))/(3*a^4*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.55, size = 112, normalized size = 0.70

$$-\frac{-16\sqrt{2}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan(ax)^{\frac{3}{2}}+16\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan(ax)^{\frac{3}{2}}+8\cos(2\arctan(ax))\arctan}{12a^4c^3\arctan(ax)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] -1/12/a^4/c^3*(-16*2^(1/2)*Pi^(1/2)*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)
^(1/2))*arctan(a*x)^(3/2)+16*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2)
)*arctan(a*x)^(3/2)+8*cos(2*arctan(a*x))*arctan(a*x)-8*cos(4*arctan(a*x))*a
rctan(a*x)+2*sin(2*arctan(a*x))-sin(4*arctan(a*x)))/arctan(a*x)^(3/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

[Out] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^3}{a^6x^6\,\mathrm{atan}^{\frac{5}{2}}(ax)+3a^4x^4\,\mathrm{atan}^{\frac{5}{2}}(ax)+3a^2x^2\,\mathrm{atan}^{\frac{5}{2}}(ax)+\mathrm{atan}^{\frac{5}{2}}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x**3/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)

[Out] Integral(x**3/(a**6*x**6*atan(a*x)**(5/2) + 3*a**4*x**4*atan(a*x)**(5/2) + 3*a**2*x**2*atan(a*x)**(5/2) + atan(a*x)**(5/2)), x)/c**3

3.1069 $\int \frac{x^2}{(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}} dx$

Optimal. Leaf size=129

$$\frac{4\sqrt{2\pi}\, C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^3c^3}-\frac{2x^2}{3ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}+\frac{8x^3}{3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/3*x^2/a/c^3/(a^2*x^2+1)^2/arctan(a*x)^(3/2)+4/3*FresnelC(2*2^(1/2)/Pi^(1
/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/a^3/c^3-8/3*x/a^2/c^3/(a^2*x^2+1)^2
/arctan(a*x)^(1/2)+8/3*x^3/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.69, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {4968, 4970, 3312, 3304, 3352, 4406, 4904}

$$\frac{4\sqrt{2\pi}\, \text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^3c^3}+\frac{8x^3}{3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2x^2}{3ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^2)/(3*a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) - (8*x)/(3*a^2*c^3*(1
+ a^2*x^2)^2*Sqrt[ArcTan[a*x]]) + (8*x^3)/(3*c^3*(1 + a^2*x^2)^2*Sqrt[ArcTa
n[a*x]]) + (4*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(3*a^3*c
^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
```

```
+ 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x^2}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{4\int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}\,dx}{3a} - \frac{1}{3}(4a)\int \frac{}{(c+}$$

$$= -\frac{2x^2}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+\right.}$$

$$= -\frac{2x^2}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+\right.}$$

$$= -\frac{2x^2}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+\right.}$$

$$= -\frac{2x^2}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+\right.}$$

$$= -\frac{2x^2}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+\right.}$$

$$= -\frac{2x^2}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{3c^3\left(1+\right.}$$

Mathematica [C] time = 0.95, size = 259, normalized size = 2.01

$$\frac{\frac{2\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3} - \frac{16\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{a^3} + \frac{-\frac{32x\tan^{-1}(ax)}{\left(a^3x^2+a\right)^2} + \frac{4\sqrt{2}\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)}{a^3} + \frac{4\sqrt{2}\left(i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)}{a^3}}{\tan}}{12c^3}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] ((2*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/a^3 - (16*Sqrt[Pi]
*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/a^3 + ((-8*x^2)/(a*(1 + a^2*x^2)
^2) + (32*x^3*ArcTan[a*x])/(1 + a^2*x^2)^2 - (32*x*ArcTan[a*x])/(a + a^3*x^
2)^2 + (4*Sqrt[2]*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcTan[a*x]])/
a^3 + (4*Sqrt[2]*(I*ArcTan[a*x])^(3/2)*Gamma[1/2, (2*I)*ArcTan[a*x]])/a^3 +
 (7*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-4*I)*ArcTan[a*x]])/a^3 + (7*(I*Ar
cTan[a*x])^(3/2)*Gamma[1/2, (4*I)*ArcTan[a*x]])/a^3)/ArcTan[a*x]^(3/2))/(12
*c^3)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.50, size = 68, normalized size = 0.53

$$-\frac{-16\sqrt{2}\,\sqrt{\pi}\,\operatorname{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan(ax)^{\frac{3}{2}}+8\sin(4\arctan(ax))\arctan(ax)-\cos(4\arctan(ax))+1}{12a^3c^3\arctan(ax)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] -1/12/a^3/c^3*(-16*2^(1/2)*Pi^(1/2)*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)
^(1/2))*arctan(a*x)^(3/2)+8*sin(4*arctan(a*x))*arctan(a*x)-cos(4*arctan(a*x
))+1)/arctan(a*x)^(3/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2}{\operatorname{atan}(a\,x)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x^2}{a^6x^6\operatorname{atan}^{\frac{5}{2}}(ax)+3a^4x^4\operatorname{atan}^{\frac{5}{2}}(ax)+3a^2x^2\operatorname{atan}^{\frac{5}{2}}(ax)+\operatorname{atan}^{\frac{5}{2}}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Integral(x**2/(a**6*x**6*atan(a*x)**(5/2) + 3*a**4*x**4*atan(a*x)**(5/2) +
3*a**2*x**2*atan(a*x)**(5/2) + atan(a*x)**(5/2)), x)/c**3
```

3.1070 $\int \frac{x}{(c+a^2cx^2)^3\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=155

$$-\frac{4\sqrt{2\pi}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^2c^3}-\frac{4\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^2c^3}+\frac{4x^2}{c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2x}{3ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}-$$

```
[Out] -2/3*x/a/c^3/(a^2*x^2+1)^2/arctan(a*x)^(3/2)-4/3*FresnelS(2*arctan(a*x)^(1/
2)/Pi^(1/2))*Pi^(1/2)/a^2/c^3-4/3*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(
1/2))*2^(1/2)*Pi^(1/2)/a^2/c^3-4/3/a^2/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)+
4*x^2/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.50, antiderivative size = 155, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 6, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.273, Rules used = {4968, 4970, 4406, 3305, 3351, 4902}

$$-\frac{4\sqrt{2\pi}\,S\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^2c^3}-\frac{4\sqrt{\pi}\,S\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3a^2c^3}+\frac{4x^2}{c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2x}{3ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}-$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x)/(3*a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) - 4/(3*a^2*c^3*(1 + a^2*
x^2)^2*Sqrt[ArcTan[a*x]]) + (4*x^2)/(c^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])
 - (4*Sqrt[2*Pi]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(3*a^2*c^3) - (4
*Sqrt[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(3*a^2*c^3)
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{2\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}\,dx}{3a} - (2a)\int \frac{}{\left(c+a\right.}$$

$$= -\frac{2x}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{c^3\left(1+a^2\right.}$$

$$= -\frac{2x}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{c^3\left(1+a^2\right.}$$

$$= -\frac{2x}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{c^3\left(1+a^2\right.}$$

$$= -\frac{2x}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{c^3\left(1+a^2\right.}$$

$$= -\frac{2x}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{c^3\left(1+a^2\right.}$$

$$= -\frac{2x}{3ac^3\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{c^3\left(1+a^2\right.}$$

Mathematica [C] time = 0.40, size = 220, normalized size = 1.42

$$\frac{i\sqrt{2}\left(a^2x^2+1\right)^2\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)+\sqrt{2}\left(a^2x^2+1\right)^2\sqrt{i\tan^{-1}(ax)}\tan^{-1}(ax)\Gamma\left(\frac{1}{2},2i\tan^{-1}(\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (I*Sqrt[2]*(1 + a^2*x^2)^2*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcTa
n[a*x]] + Sqrt[2]*(1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*ArcTan[a*x]*Gamma[1/2
```

```
, (2*I)*ArcTan[a*x]] + 2*(-(a*x) - 2*ArcTan[a*x] + 6*a^2*x^2*ArcTan[a*x] +
I*(1 + a^2*x^2)^2*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-4*I)*ArcTan[a*x]] +
 (1 + a^2*x^2)^2*Sqrt[I*ArcTan[a*x]]*ArcTan[a*x]*Gamma[1/2, (4*I)*ArcTan[a*
x]]))/(3*c^3*(a + a^3*x^2)^2*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.46, size = 110, normalized size = 0.71

$$-\frac{16\sqrt{2}\,\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan(ax)^{\frac{3}{2}}+16\sqrt{\pi}\,\mathrm{S}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan(ax)^{\frac{3}{2}}+8\cos(2\arctan(ax))\arctan(}{12a^{2}c^{3}\arctan(ax)^{\frac{3}{2}}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] -1/12/a^2/c^3*(16*2^(1/2)*Pi^(1/2)*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^
(1/2))*arctan(a*x)^(3/2)+16*Pi^(1/2)*FresnelS(2*arctan(a*x)^(1/2)/Pi^(1/2))
*arctan(a*x)^(3/2)+8*cos(2*arctan(a*x))*arctan(a*x)+8*cos(4*arctan(a*x))*ar
ctan(a*x)+2*sin(2*arctan(a*x))+sin(4*arctan(a*x)))/arctan(a*x)^(3/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x}{a^6x^6 \operatorname{atan}^{\frac{5}{2}}(ax)+3a^4x^4 \operatorname{atan}^{\frac{5}{2}}(ax)+3a^2x^2 \operatorname{atan}^{\frac{5}{2}}(ax)+\operatorname{atan}^{\frac{5}{2}}(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Integral(x/(a**6*x**6*atan(a*x)**(5/2) + 3*a**4*x**4*atan(a*x)**(5/2) + 3*a
**2*x**2*atan(a*x)**(5/2) + atan(a*x)**(5/2)), x)/c**3
```

3.1071 $\int \frac{1}{\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=125

$$\frac{16x}{3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2}{3ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}-\frac{4\sqrt{2\pi}\,C\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3ac^3}-\frac{8\sqrt{\pi}\,C\left(\frac{2\sqrt{\tan^{-1}(ax)}}{\sqrt{\pi}}\right)}{3ac^3}$$

```
[Out] -2/3/a/c^3/(a^2*x^2+1)^2/arctan(a*x)^(3/2)-8/3*FresnelC(2*arctan(a*x)^(1/2)
/Pi^(1/2))*Pi^(1/2)/a/c^3-4/3*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2)
)*2^(1/2)*Pi^(1/2)/a/c^3+16/3*x/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.30, antiderivative size = 125, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4902, 4968, 4970, 4406, 3304, 3352, 4904, 3312}

$$\frac{16x}{3c^3\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{2}{3ac^3\left(a^2x^2+1\right)^2\tan^{-1}(ax)^{3/2}}-\frac{4\sqrt{2\pi}\,\text{FresnelC}\left(2\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3ac^3}-\frac{8\sqrt{\pi}\,\text{FresnelC}}{3a}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^3*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) + (16*x)/(3*c^3*(1 + a^2*x^2
)^2*Sqrt[ArcTan[a*x]]) - (4*Sqrt[2*Pi]*FresnelC[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*
x]]])/(3*a*c^3) - (8*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(3*
a*c^3)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
```

```
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{1}{3}(8a)\int \frac{x}{\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx$$

$$= -\frac{2}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{16x}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} - \frac{16}{3}\int \frac{}{(c+}$$

$$= -\frac{2}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{16x}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} - \frac{16\,\mathrm{Subst}\left(\int\right.}{}$$

$$= -\frac{2}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{16x}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} - \frac{16\,\mathrm{Subst}\left(\int\right.}{}$$

$$= -\frac{2}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{16x}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} - \frac{2\,\mathrm{Subst}\left(\int\right.}{}$$

$$= -\frac{2}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{16x}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} - \frac{4\,\mathrm{Subst}\left(\int\right.}{}$$

$$= -\frac{2}{3ac^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{16x}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} - \frac{4\sqrt{2\pi}\,C\left(2\right.}{}$$

Mathematica [C] time = 0.72, size = 186, normalized size = 1.49

$$\frac{2\left(-\frac{1}{a\left(a^2x^2+1\right)^2}+\frac{8x\tan^{-1}(ax)}{\left(a^2x^2+1\right)^2}+\frac{\sqrt{2}\tan^{-1}(ax)^2\Gamma\left(\frac{1}{2},2i\tan^{-1}(ax)\right)}{a\sqrt{i\tan^{-1}(ax)}}+\frac{\tan^{-1}(ax)^2\Gamma\left(\frac{1}{2},4i\tan^{-1}(ax)\right)}{a\sqrt{i\tan^{-1}(ax)}}-\frac{\sqrt{2}\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},-2i\tan^{-1}(ax)\right)}{a}-\right.}{3c^3\tan^{-1}(ax)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (2*(-(1/(a*(1 + a^2*x^2)^2)) + (8*x*ArcTan[a*x])/(1 + a^2*x^2)^2 - (Sqrt[2]
*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-2*I)*ArcTan[a*x]])/a + (Sqrt[2]*ArcT
an[a*x]^2*Gamma[1/2, (2*I)*ArcTan[a*x]])/(a*Sqrt[I*ArcTan[a*x]]) - (((-I)*A
rcTan[a*x])^(3/2)*Gamma[1/2, (-4*I)*ArcTan[a*x]])/a + (ArcTan[a*x]^2*Gamma[
1/2, (4*I)*ArcTan[a*x]])/(a*Sqrt[I*ArcTan[a*x]])))/(3*c^3*ArcTan[a*x]^(3/2)
)
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.70, size = 113, normalized size = 0.90

$$\frac{-16\sqrt{2}\,\sqrt{\pi}\ \mathrm{FresnelC}\left(\frac{2\sqrt{2}\,\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan\left(ax\right)^{\frac{3}{2}}-32\sqrt{\pi}\ \mathrm{FresnelC}\left(\frac{2\sqrt{\arctan(ax)}}{\sqrt{\pi}}\right)\arctan\left(ax\right)^{\frac{3}{2}}+16\sin\left(2\,\mathrm{ar}\right.}{12a\,c^3\arctan}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] 1/12/a/c^3*(-16*2^(1/2)*Pi^(1/2)*FresnelC(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1
/2))*arctan(a*x)^(3/2)-32*Pi^(1/2)*FresnelC(2*arctan(a*x)^(1/2)/Pi^(1/2))*a
rctan(a*x)^(3/2)+16*sin(2*arctan(a*x))*arctan(a*x)+8*sin(4*arctan(a*x))*arc
tan(a*x)-4*cos(2*arctan(a*x))-cos(4*arctan(a*x))-3)/arctan(a*x)^(3/2)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6}x^{6}\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}+3a^{4}x^{4}\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}+3a^{2}x^{2}\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}+\operatorname{atan}^{\frac{5}{2}}{\left(ax \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**6*x**6*atan(a*x)**(5/2) + 3*a**4*x**4*atan(a*x)**(5/2) + 3*a
**2*x**2*atan(a*x)**(5/2) + atan(a*x)**(5/2)), x)/c**3
```

3.1072 $\int \frac{1}{x(c+a^2cx^2)^3 \tan^{-1}(ax)^{5/2}} dx$

Optimal. Leaf size=216

$$8\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+\frac{4}{3a^2c^3x^2\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}+\frac{}{3c^3\left(a^2x^2\right.}$$

```
[Out] -2/3/a/c^3/x/(a^2*x^2+1)^2/arctan(a*x)^(3/2)+20/3*FresnelS(2*arctan(a*x)^(1
/2)/Pi^(1/2))*Pi^(1/2)/c^3+5/3*FresnelS(2*2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2
))*2^(1/2)*Pi^(1/2)/c^3+20/3/c^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)+4/3/a^2/c^
3/x^2/(a^2*x^2+1)^2/arctan(a*x)^(1/2)+8/3*Unintegrable(1/x^3/(a^2*c*x^2+c)^
3/arctan(a*x)^(1/2),x)/a^2+8*Unintegrable(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(
1/2),x)
```

Rubi [A] time = 0.41, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}} dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^3*x*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) + 20/(3*c^3*(1 + a^2*x^2)^
2*Sqrt[ArcTan[a*x]]) + 4/(3*a^2*c^3*x^2*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])
+ (5*Sqrt[2*Pi]*FresnelS[2*Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(3*c^3) + (20*Sqr
t[Pi]*FresnelS[(2*Sqrt[ArcTan[a*x]])/Sqrt[Pi]])/(3*c^3) + (8*Defer[Int][1/(
x^3*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/(3*a^2) + 8*Defer[Int][1/(x*(
c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx}{3a} - \frac{1}{3}(10a)\int$$

$$= -\frac{2}{3ac^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{20}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^3x^2}$$

$$= -\frac{2}{3ac^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{20}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^3x^2}$$

$$= -\frac{2}{3ac^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{20}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^3x^2}$$

$$= -\frac{2}{3ac^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{20}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^3x^2}$$

$$= -\frac{2}{3ac^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{20}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^3x^2}$$

$$= -\frac{2}{3ac^3x\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}} + \frac{20}{3c^3\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c^3x^2}$$

Mathematica [A] time = 6.23, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.81, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^2c\,x^2+c\right)^3 \arctan\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{5/2}\,\left(c\,a^2\,x^2+c\right)^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^6x^7\,\mathrm{atan}^{\frac{5}{2}}\,(ax)+3a^4x^5\,\mathrm{atan}^{\frac{5}{2}}\,(ax)+3a^2x^3\,\mathrm{atan}^{\frac{5}{2}}\,(ax)+x\,\mathrm{atan}^{\frac{5}{2}}\,(ax)}\,dx}{c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**6*x**7*atan(a*x)**(5/2) + 3*a**4*x**5*atan(a*x)**(5/2) + 3*a
**2*x**3*atan(a*x)**(5/2) + x*atan(a*x)**(5/2)), x)/c**3
```

3.1073 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=231

$$\frac{80}{3}\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+\frac{8}{c^3x\left(a^2x^2+1\right)^2\sqrt{\tan^{-1}(ax)}}-\frac{}{3ac^3x^2\left(\right.}$$

```
[Out] -2/3/a/c^3/x^2/(a^2*x^2+1)^2/arctan(a*x)^(3/2)+5/2*a*FresnelC(2*2^(1/2)/Pi^
(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)/c^3+20*a*FresnelC(2*arctan(a*x)^(
1/2)/Pi^(1/2))*Pi^(1/2)/c^3+8/3/a^2/c^3/x^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)
+8/c^3/x/(a^2*x^2+1)^2/arctan(a*x)^(1/2)+30*a*arctan(a*x)^(1/2)/c^3+8*Unint
egrable(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)/a^2+80/3*Unintegrable(1/
x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.51, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^3*x^2*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) + 8/(3*a^2*c^3*x^3*(1 +
a^2*x^2)^2*Sqrt[ArcTan[a*x]]) + 8/(c^3*x*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x]])
 + (30*a*Sqrt[ArcTan[a*x]])/c^3 + (5*a*Sqrt[Pi/2]*FresnelC[2*Sqrt[2/Pi]*Sqr
t[ArcTan[a*x]]])/c^3 + (20*a*Sqrt[Pi]*FresnelC[(2*Sqrt[ArcTan[a*x]])/Sqrt[P
i]])/c^3 + (8*Defer[Int][1/(x^4*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/a
^2 + (80*Defer[Int][1/(x^2*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac^3x^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} - \frac{4\int \frac{1}{x^3\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{3/2}}\,dx}{3a} - (4a)\int \frac{}{x(}$$

$$= -\frac{2}{3ac^3x^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^3x^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{c^3x(}$$

$$= -\frac{2}{3ac^3x^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^3x^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{c^3x(}$$

$$= -\frac{2}{3ac^3x^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^3x^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{c^3x(}$$

$$= -\frac{2}{3ac^3x^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^3x^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{c^3x(}$$

$$= -\frac{2}{3ac^3x^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^3x^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{c^3x(}$$

$$= -\frac{2}{3ac^3x^2\left(1+a^2x^2\right)^2 \tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2c^3x^3\left(1+a^2x^2\right)^2 \sqrt{\tan^{-1}(ax)}} + \frac{}{c^3x(}$$

Mathematica [A] time = 8.47, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 2.77, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{8} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 3 a^{4} x^{6} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 3 a^{2} x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x^{2} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**6*x**8*atan(a*x)**(5/2) + 3*a**4*x**6*atan(a*x)**(5/2) + 3*a
**2*x**4*atan(a*x)**(5/2) + x**2*atan(a*x)**(5/2)), x)/c**3
```

3.1074 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=187

$$56a^2\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)+\frac{16\text{Int}\left(\frac{1}{x^5\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+\frac{152}{3}\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right.$$

```
[Out] -2/3/a/c^3/x^3/(a^2*x^2+1)^2/arctan(a*x)^(3/2)+4/a^2/c^3/x^4/(a^2*x^2+1)^2/
arctan(a*x)^(1/2)+28/3/c^3/x^2/(a^2*x^2+1)^2/arctan(a*x)^(1/2)+16*Unintegra
ble(1/x^5/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)/a^2+152/3*Unintegrable(1/x^3
/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)+56*a^2*Unintegrable(1/x/(a^2*c*x^2+c)
^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.46, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^3*x^3*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) + 4/(a^2*c^3*x^4*(1 + a^
2*x^2)^2*Sqrt[ArcTan[a*x]]) + 28/(3*c^3*x^2*(1 + a^2*x^2)^2*Sqrt[ArcTan[a*x
]]) + (16*Defer[Int][1/(x^5*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/a^2 +
 (152*Defer[Int][1/(x^3*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/3 + 56*a^
2*Defer[Int][1/(x*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2}{3ac^3x^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}-\frac{2\int \frac{1}{x^4\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx}{a}-\frac{1}{3}(14a)\int$$

$$=-\frac{2}{3ac^3x^3\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}+\frac{4}{a^2c^3x^4\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}+\frac{}{3c^3x^2}$$

Mathematica [A] time = 6.25, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 8.64, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c \,x^{2}+c \right)^{3} \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{9} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 3 a^{4} x^{7} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 3 a^{2} x^{5} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x^{3} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**6*x**9*atan(a*x)**(5/2) + 3*a**4*x**7*atan(a*x)**(5/2) + 3*a
**2*x**5*atan(a*x)**(5/2) + x**3*atan(a*x)**(5/2)), x)/c**3
```

3.1075 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=191

$$\frac{224}{3}a^2\mathrm{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)+\frac{80\mathrm{Int}\left(\frac{1}{x^6\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+80\mathrm{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^3\sqrt{\tan^{-1}(ax)}},\right.$$

```
[Out] -2/3/a/c^3/x^4/(a^2*x^2+1)^2/arctan(a*x)^(3/2)+16/3/a^2/c^3/x^5/(a^2*x^2+1)
^2/arctan(a*x)^(1/2)+32/3/c^3/x^3/(a^2*x^2+1)^2/arctan(a*x)^(1/2)+80/3*Unin
tegrable(1/x^6/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)/a^2+80*Unintegrable(1/x
^4/(a^2*c*x^2+c)^3/arctan(a*x)^(1/2),x)+224/3*a^2*Unintegrable(1/x^2/(a^2*c
*x^2+c)^3/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.47, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c^3*x^4*(1 + a^2*x^2)^2*ArcTan[a*x]^(3/2)) + 16/(3*a^2*c^3*x^5*(1 +
 a^2*x^2)^2*Sqrt[ArcTan[a*x]]) + 32/(3*c^3*x^3*(1 + a^2*x^2)^2*Sqrt[ArcTan[
a*x]]) + (80*Defer[Int][1/(x^6*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/(3
*a^2) + 80*Defer[Int][1/(x^4*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x] + (22
4*a^2*Defer[Int][1/(x^2*(c + a^2*c*x^2)^3*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac^3x^4\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}-\frac{8\int \frac{1}{x^5\left(c+a^2cx^2\right)^3\tan^{-1}(ax)^{3/2}}\,dx}{3a}-\frac{1}{3}(16a)\int$$

$$=-\frac{2}{3ac^3x^4\left(1+a^2x^2\right)^2\tan^{-1}(ax)^{3/2}}+\frac{16}{3a^2c^3x^5\left(1+a^2x^2\right)^2\sqrt{\tan^{-1}(ax)}}+\frac{}{3c^3x}$$

Mathematica [A] time = 13.24, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^3 \tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^3*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 4.39, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{4} \left(a^{2} c\,x^{2}+c\right)^{3} \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^3/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^3} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3),x)
```

```
[Out] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^3), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{1}{a^{6} x^{10} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 3 a^{4} x^{8} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + 3 a^{2} x^{6} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)} + x^{4} \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx}{c^{3}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**3/atan(a*x)**(5/2),x)
```

```
[Out] Integral(1/(a**6*x**10*atan(a*x)**(5/2) + 3*a**4*x**8*atan(a*x)**(5/2) + 3*
a**2*x**6*atan(a*x)**(5/2) + x**4*atan(a*x)**(5/2)), x)/c**3
```

3.1076 $\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m \sqrt{a^2 c x^2+c}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^{5/2}} \, dx = \int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^{5/2}} \, dx$$

Mathematica [A] time = 0.74, size = 0, normalized size = 0.00

$$\int \frac{x^m \sqrt{c+a^2 c x^2}}{\tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x^m*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2 c x^2+c}\, x^m}{\arctan(ax)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/arctan(a*x)^(5/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.94, size = 0, normalized size = 0.00

$$\int \frac{x^{m}\sqrt{a^{2}c\,x^{2}+c}}{\arctan\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
[Out] int(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^{m}\,\sqrt{c\,a^{2}\,x^{2}+c}}{\mathrm{atan}\left(a\,x\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(5/2),x)
[Out] int((x^m*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(1/2)/atan(a*x)**(5/2),x)
[Out] Timed out
```

3.1077 $\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.07, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx = \int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 2.71, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x*Sqrt[c + a^2*c*x^2])/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.83, size = 0, normalized size = 0.00

$$\int \frac{x\sqrt{a^2 c\, x^2 + c}}{\arctan\left(ax\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
[Out] int(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,\sqrt{c\,a^2\,x^2+c}}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(5/2),x)
[Out] int((x*(c + a^2*c*x^2)^(1/2))/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x \sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(1/2)/atan(a*x)**(5/2),x)
[Out] Integral(x*sqrt(c*(a**2*x**2 + 1))/atan(a*x)**(5/2), x)
```

3.1078 $\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.59, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(5/2),x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.47, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c \,x^{2}+c}}{\arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
[Out] int((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^(5/2),x)
[Out] int((c + a^2*c*x^2)^(1/2)/atan(a*x)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{\operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/atan(a*x)**(5/2),x)
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/atan(a*x)**(5/2), x)
```

3.1079 $\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{\sqrt{a^2cx^2+c}}{x\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{5/2}}\,dx = \int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 18.82, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c+a^2cx^2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[Sqrt[c + a^2*c*x^2]/(x*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.72, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{a^{2} c \,x^{2}+c}}{x \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(1/2)/x/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{\sqrt{c\,a^2\,x^2+c}}{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^(5/2)),x)
```

```
[Out] int((c + a^2*c*x^2)^(1/2)/(x*atan(a*x)^(5/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{c \left(a^{2} x^{2} + 1\right)}}{x \operatorname{atan}^{\frac{5}{2}}{\left(a x \right)}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(1/2)/x/atan(a*x)**(5/2),x)
```

```
[Out] Integral(sqrt(c*(a**2*x**2 + 1))/(x*atan(a*x)**(5/2)), x)
```

3.1080 $\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^2cx^2+c\right)^{\frac{3}{2}}x^m}{\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^2*c*x^2 + c)^(3/2)*x^m/arctan(a*x)^(5/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.82, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{\arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(5/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1081 $\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 2.75, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x*(c + a^2*c*x^2)^(3/2))/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.66, size = 0, normalized size = 0.00

$$\int \frac{x \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{\arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(5/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^(3/2))/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1082 $\int \frac{(c+a^2cx^2)^{3/2}}{\tan^{-1}(ax)^{5/2}} \, dx$

Optimal. Leaf size=26

$$\operatorname{Int}\left(\frac{\left(a^2cx^2+c\right)^{3/2}}{\tan^{-1}(ax)^{5/2}},x\right)$$

[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

[In] Int[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(5/2),x]

[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(5/2), x]

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}} \, dx = \int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}} \, dx$$

Mathematica [A] time = 1.71, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{3/2}}{\tan^{-1}(ax)^{5/2}} \, dx$$

Verification is Not applicable to the result.

[In] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(5/2),x]

[Out] Integrate[(c + a^2*c*x^2)^(3/2)/ArcTan[a*x]^(5/2), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integ rate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.42, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{\arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
[Out] int((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^(5/2),x)
[Out] int((c + a^2*c*x^2)^(3/2)/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
[Out] Timed out
```

3.1083 $\int \frac{(c+a^2cx^2)^{3/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{(a^2cx^2+c)^{3/2}}{x\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{(c+a^2cx^2)^{3/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{(c+a^2cx^2)^{3/2}}{x\tan^{-1}(ax)^{5/2}}\,dx = \int \frac{(c+a^2cx^2)^{3/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 12.11, size = 0, normalized size = 0.00

$$\int \frac{(c+a^2cx^2)^{3/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[(c + a^2*c*x^2)^(3/2)/(x*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.61, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}}}{x \arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(5/2),x)
[Out] int((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(3/2)/x/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{3/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^(5/2)),x)
[Out] int((c + a^2*c*x^2)^(3/2)/(x*atan(a*x)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(3/2)/x/atan(a*x)**(5/2),x)
[Out] Timed out
```

3.1084 $\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.50, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x^m*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\sqrt{a^2cx^2+c}\,x^m}{\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*sqrt(a^2*c*x^2 + c)*x^m/arctan
(a*x)^(5/2), x)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 2.77, size = 0, normalized size = 0.00

$$\int \frac{x^m \left(a^2 c x^2 + c\right)^{\frac{5}{2}}}{\arctan\left(ax\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m \left(c\, a^2\, x^2 + c\right)^{5/2}}{\mathrm{atan}\left(a\, x\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(5/2),x)
```

```
[Out] int((x^m*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1085 $\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2),x]
[Out] Defer[Int][(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 3.43, size = 0, normalized size = 0.00

$$\int \frac{x\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2),x]
[Out] Integrate[(x*(c + a^2*c*x^2)^(5/2))/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.89, size = 0, normalized size = 0.00

$$\int \frac{x \left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}{\arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(5/2),x)
```

```
[Out] int((x*(c + a^2*c*x^2)^(5/2))/atan(a*x)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1086 $\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(5/2),x]
```

```
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(5/2), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.83, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(5/2),x]
```

```
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/ArcTan[a*x]^(5/2), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A]   time = 1.51, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}}}{\arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
[Out] int((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^(5/2),x)
[Out] int((c + a^2*c*x^2)^(5/2)/atan(a*x)^(5/2), x)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
[Out] Timed out
```

3.1087 $\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\mathrm{Int}\left(\frac{\left(a^2cx^2+c\right)^{5/2}}{x\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 11.62, size = 0, normalized size = 0.00

$$\int \frac{\left(c+a^2cx^2\right)^{5/2}}{x\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[(c + a^2*c*x^2)^(5/2)/(x*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >> Error detected within library code: integ
rate: implementation incomplete (constant residues)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.79, size = 0, normalized size = 0.00

$$\int \frac{\left(a^{2}c\,x^{2}+c\right)^{\frac{5}{2}}}{x \arctan\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(5/2),x)
```

```
[Out] int((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a^2*c*x^2+c)^(5/2)/x/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{{\left(c\,a^2\,x^2+c\right)}^{5/2}}{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^(5/2)),x)
```

```
[Out] int((c + a^2*c*x^2)^(5/2)/(x*atan(a*x)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a**2*c*x**2+c)**(5/2)/x/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1088 $\int \frac{x^m}{\sqrt{c+a^2cx^2} \tan^{-1}(ax)^{5/2}} dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx = \int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 0.91, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[x^m/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x^m}{\sqrt{a^2cx^2+c}\arctan(ax)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] integral(x^m/(sqrt(a^2*c*x^2 + c)*arctan(a*x)^(5/2)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.99, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\arctan\left(ax\right)^{\frac{5}{2}} \sqrt{a^{2}c\,x^{2}+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x^m/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.1089 $\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=27

$$\text{Int}\left(\frac{x}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.85, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[x/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 3.42, size = 0, normalized size = 0.00

$$\int \frac{x}{\arctan(ax)^{\frac{5}{2}}\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{5/2}\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x}{\sqrt{c\left(a^2x^2+1\right)}\ \mathrm{atan}^{\frac{5}{2}}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(x/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(5/2)), x)
```

3.1090 $\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=26

$$\text{Int}\left(\frac{1}{\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(1/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

Rubi [A] time = 0.04, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 0.83, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.31, size = 0, normalized size = 0.00

$$\int \frac{1}{\arctan(ax)^{\frac{5}{2}}\sqrt{a^2c\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(1/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{5/2}\,\sqrt{c\,a^2\,x^2+c}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{\sqrt{c\left(a^2x^2+1\right)}\,\mathrm{atan}^{\frac{5}{2}}\left(ax\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(1/(sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(5/2)), x)
```

3.1091 $\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=72

$$-\frac{2\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}},x\right)}{3a}-\frac{2\sqrt{a^2cx^2+c}}{3acx\tan^{-1}(ax)^{3/2}}$$

```
[Out] -2/3*(a^2*c*x^2+c)^(1/2)/a/c/x/arctan(a*x)^(3/2)-2/3*Unintegrable(1/x^2/arc
tan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2),x)/a
```

Rubi [A] time = 0.22, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*Sqrt[c + a^2*c*x^2])/(3*a*c*x*ArcTan[a*x]^(3/2)) - (2*Defer[Int][1/(x^2
*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)), x])/(3*a)
```

Rubi steps

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2\sqrt{c+a^2cx^2}}{3acx\tan^{-1}(ax)^{3/2}}-\frac{2\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}\,dx}{3a}$$

Mathematica [A] time = 3.62, size = 0, normalized size = 0.00

$$\int \frac{1}{x\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.62, size = 0, normalized size = 0.00

$$\int \frac{1}{x \arctan(ax)^{\frac{5}{2}} \sqrt{a^2 c\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(1/x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x\, \mathrm{atan}\left(a\, x\right)^{5/2} \sqrt{c\, a^2\, x^2 + c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{1}{x \sqrt{c \left(a^2 x^2 + 1\right)}\, \mathrm{atan}^{\frac{5}{2}}\left(ax\right)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Integral(1/(x*sqrt(c*(a**2*x**2 + 1))*atan(a*x)**(5/2)), x)
```

3.1092 $\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{1}{x^2\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{5/2}},x\right)$$

[Out] Unintegrable(1/x^2/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)

Rubi [A] time = 0.11, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]

[Out] Defer[Int][1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]

Rubi steps

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx = \int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 20.55, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)),x]

[Out] Integrate[1/(x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(5/2)), x]

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^2/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="fricas")

[Out] Exception raised: TypeError >> Error detected within library code: integrate: implementation incomplete (constant residues)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(1/x^2/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="giac")

[Out] sage0*x

maple [A] time = 1.78, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \arctan \left(a x\right)^{\frac{5}{2}} \sqrt{a^{2} c \,x^{2}+c}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

```
[Out] int(1/x^2/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/arctan(a*x)^(5/2)/(a^2*c*x^2+c)^(1/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,\sqrt{c\,a^2\,x^2+c}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(1/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/atan(a*x)**(5/2)/(a**2*c*x**2+c)**(1/2),x)
```

```
[Out] Timed out
```

3.1093 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{5/2}},x\right)$$

[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]

[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.07, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]

[Out] Integrate[x^m/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^4c^2x^4+2\,a^2c^2x^2+c^2\right)\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")

[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^4*c^2*x^4 + 2*a^2*c^2*x^2 + c^2)*arcta n(a*x)^(5/2)), x)

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")

```
[Out] sage0*x
```

maple [A] time = 2.88, size = 0, normalized size = 0.00

$$\int \frac{x^{m}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1094 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=229

$$8a^2\text{Int}\left(\frac{x^5}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{44}{3}\text{Int}\left(\frac{x^3}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{4x^2}{a^2c\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}-\frac{\ldots}{3c\sqrt{a\ldots}}$$

```
[Out] -2/3*x^3/a/c/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)+8*FresnelS(2^(1/2)/Pi^(1
/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c/(a^2*c*x^2+
c)^(1/2)-4*x^2/a^2/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)-8/3*x^4/c/(a^2*c
*x^2+c)^(1/2)/arctan(a*x)^(1/2)+44/3*Unintegrable(x^3/(a^2*c*x^2+c)^(3/2)/a
rctan(a*x)^(1/2),x)+8*a^2*Unintegrable(x^5/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^
(1/2),x)
```

Rubi [A] time = 0.93, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^3)/(3*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) - (4*x^2)/(a^2*c*Sqr
t[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (8*x^4)/(3*c*Sqrt[c + a^2*c*x^2]*Sqrt
[ArcTan[a*x]]) + (8*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[A
rcTan[a*x]]])/(a^4*c*Sqrt[c + a^2*c*x^2]) + (44*Defer[Int][x^3/((c + a^2*c*
x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x])/3 + 8*a^2*Defer[Int][x^5/((c + a^2*c*x^2
)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2x^3}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}+\frac{2\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx}{a}+\frac{1}{3}(4a)\int \frac{\ldots}{\left(c+a\ldots\right.}$$

$$=-\frac{2x^3}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}-\frac{4x^2}{a^2c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{8x^4}{3c\sqrt{c+a^2cx^2}\ldots}$$

$$=-\frac{2x^3}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}-\frac{4x^2}{a^2c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{8x^4}{3c\sqrt{c+a^2cx^2}\ldots}$$

$$=-\frac{2x^3}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}-\frac{4x^2}{a^2c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{8x^4}{3c\sqrt{c+a^2cx^2}\ldots}$$

$$=-\frac{2x^3}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}-\frac{4x^2}{a^2c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{8x^4}{3c\sqrt{c+a^2cx^2}\ldots}$$

$$=-\frac{2x^3}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}-\frac{4x^2}{a^2c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}-\frac{8x^4}{3c\sqrt{c+a^2cx^2}\ldots}$$

Mathematica [A] time = 7.56, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[x^3/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 8.88, size = 0, normalized size = 0.00

$$\int \frac{x^3}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
[Out] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
[Out] Timed out
```

3.1095 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=231

$$4\text{Int}\left(\frac{x^2}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8}{3}a^2\text{Int}\left(\frac{x^4}{\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)-\frac{2x^2}{3ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}-\frac{}{3a}$$

```
[Out] -2/3*x^2/a/c/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)+8/3*FresnelC(2^(1/2)/Pi^
(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^3/c/(a^2*c*x^
2+c)^(1/2)-8/3*x/a^2/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)-4/3*x^3/c/(a^2
*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)+4*Unintegrable(x^2/(a^2*c*x^2+c)^(3/2)/ar
ctan(a*x)^(1/2),x)+8/3*a^2*Unintegrable(x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)
^(1/2),x)
```

Rubi [A] time = 0.68, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^2)/(3*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) - (8*x)/(3*a^2*c*Sqr
t[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (4*x^3)/(3*c*Sqrt[c + a^2*c*x^2]*Sqrt
[ArcTan[a*x]]) + (8*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[A
rcTan[a*x]]])/(3*a^3*c*Sqrt[c + a^2*c*x^2]) + 4*Defer[Int][x^2/((c + a^2*c*
x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x] + (8*a^2*Defer[Int][x^4/((c + a^2*c*x^2)^
(3/2)*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx &= -\frac{2x^2}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}+\frac{4\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a}+\frac{1}{3}(2a)\int \frac{}{(c} \\
&= -\frac{2x^2}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{}{3c\sqrt{c+a^2}} \\
&= -\frac{2x^2}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{}{3c\sqrt{c+a^2}} \\
&= -\frac{2x^2}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{}{3c\sqrt{c+a^2}} \\
&= -\frac{2x^2}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{}{3c\sqrt{c+a^2}} \\
&= -\frac{2x^2}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{}{3c\sqrt{c+a^2}}
\end{aligned}$$

Mathematica [A] time = 6.78, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[x^2/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 8.76, size = 0, normalized size = 0.00

$$\int \frac{x^2}{\left(a^2c\,x^2+c\right)^{\frac{3}{2}}\arctan\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
[Out] int(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1096 $\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=129

$$-\frac{4\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^2c\sqrt{a^2cx^2+c}}-\frac{2x}{3ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}-\frac{4}{3a^2c\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)}}$$

```
[Out] -2/3*x/a/c/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)-4/3*FresnelS(2^(1/2)/Pi^(1
/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c/(a^2*c*x^2+
c)^(1/2)-4/3/a^2/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.30, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4942, 4902, 4971, 4970, 3305, 3351}

$$-\frac{4\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^2c\sqrt{a^2cx^2+c}}-\frac{2x}{3ac\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}-\frac{4}{3a^2c\sqrt{a^2cx^2+c}\,\sqrt{\tan^{-1}(ax)}}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x)/(3*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) - 4/(3*a^2*c*Sqrt[c +
a^2*c*x^2]*Sqrt[ArcTan[a*x]]) - (4*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sq
rt[2/Pi]*Sqrt[ArcTan[a*x]]])/(3*a^2*c*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
```

```
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}+\frac{2\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a}$$

$$= -\frac{2x}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{4}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{4}{3}\int \frac{}{(c+}$$

$$= -\frac{2x}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{4}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{\left(4\sqrt{1+a^2}\right.}{}$$

$$= -\frac{2x}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{4}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{\left(4\sqrt{1+a^2}\right.}{}$$

$$= -\frac{2x}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{4}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{\left(8\sqrt{1+a^2}\right.}{}$$

$$= -\frac{2x}{3ac\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}}-\frac{4}{3a^2c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}}-\frac{4\sqrt{2\pi}\,\sqrt{1}}{}$$

Mathematica [C] time = 0.19, size = 124, normalized size = 0.96

$$-\frac{2\left(-i\sqrt{a^2x^2+1}\,\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)+i\sqrt{a^2x^2+1}\,\left(i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+ax+2\right.}{3a^2c\sqrt{a^2cx^2+c}\,\tan^{-1}(ax)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*(a*x + 2*ArcTan[a*x] - I*Sqrt[1 + a^2*x^2]*((-I)*ArcTan[a*x])^(3/2)*Gam
ma[1/2, (-I)*ArcTan[a*x]] + I*Sqrt[1 + a^2*x^2]*(I*ArcTan[a*x])^(3/2)*Gamma
[1/2, I*ArcTan[a*x]]))/(3*a^2*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 3.12, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c\, x^{2}+c\right)^{\frac{3}{2}} \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1097 $\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=126

$$-\frac{4\sqrt{2\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3ac\sqrt{a^2cx^2+c}}+\frac{4x}{3c\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}-\frac{2}{3ac\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}}$$

```
[Out] -2/3/a/c/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)-4/3*FresnelC(2^(1/2)/Pi^(1/2
)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c/(a^2*c*x^2+c)^(
1/2)+4/3*x/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 126, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {4902, 4942, 4905, 4904, 3304, 3352}

$$-\frac{4\sqrt{2\pi}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3ac\sqrt{a^2cx^2+c}}+\frac{4x}{3c\sqrt{a^2cx^2+c}\sqrt{\tan^{-1}(ax)}}-\frac{2}{3ac\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) + (4*x)/(3*c*Sqrt[c + a^2*
c*x^2]*Sqrt[ArcTan[a*x]]) - (4*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2
/Pi]*Sqrt[ArcTan[a*x]]])/(3*a*c*Sqrt[c + a^2*c*x^2])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
```

```
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}} - \frac{1}{3}(2a)\int \frac{x}{\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx$$

$$= -\frac{2}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{3c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{4}{3}\int \frac{}{\left(c+a^2cx^2\right.}$$

$$= -\frac{2}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{3c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a^2x^2}\right)\int}{3c}$$

$$= -\frac{2}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{3c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a^2x^2}\right)S}{}$$

$$= -\frac{2}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{3c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(8\sqrt{1+a^2x^2}\right)S}{}$$

$$= -\frac{2}{3ac\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{3c\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}} - \frac{4\sqrt{2\pi}\sqrt{1+a^2x}}{3ac}$$

Mathematica [C] time = 0.15, size = 120, normalized size = 0.95

$$\frac{-2\sqrt{a^2x^2+1}\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},-i\tan^{-1}(ax)\right)-2\sqrt{a^2x^2+1}\left(i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)+4ax\tan^{-1}(a}{3ac\sqrt{a^2cx^2+c}\tan^{-1}(ax)^{3/2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2 + 4*a*x*ArcTan[a*x] - 2*Sqrt[1 + a^2*x^2]*((-I)*ArcTan[a*x])^(3/2)*Gamm
a[1/2, (-I)*ArcTan[a*x]] - 2*Sqrt[1 + a^2*x^2]*(I*ArcTan[a*x])^(3/2)*Gamma[
1/2, I*ArcTan[a*x]])/(3*a*c*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.40, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1098 $\int \frac{1}{x(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=227

$$4\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+\frac{8\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3c\sqrt{a^2cx^2+c}}+\frac{}{3}$$

```
[Out] -2/3/a/c/x/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)+8/3*FresnelS(2^(1/2)/Pi^(1
/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)^(
1/2)+8/3/c/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)+4/3/a^2/c/x^2/(a^2*c*x^2+c
)^(1/2)/arctan(a*x)^(1/2)+8/3*Unintegrable(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan
(a*x)^(1/2),x)/a^2+4*Unintegrable(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)
,x)
```

Rubi [A] time = 0.70, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) + 8/(3*c*Sqrt[c + a^2*c*
x^2]*Sqrt[ArcTan[a*x]]) + 4/(3*a^2*c*x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[a*
x]]) + (8*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]
]])/(3*c*Sqrt[c + a^2*c*x^2]) + (8*Defer[Int][1/(x^3*(c + a^2*c*x^2)^(3/2)*
Sqrt[ArcTan[a*x]]), x])/(3*a^2) + 4*Defer[Int][1/(x*(c + a^2*c*x^2)^(3/2)*S
qrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}dx}{3a} - \frac{1}{3}(4a)\int$$

$$= -\frac{2}{3acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2cx^2\sqrt{c}}$$

$$= -\frac{2}{3acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2cx^2\sqrt{c}}$$

$$= -\frac{2}{3acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2cx^2\sqrt{c}}$$

$$= -\frac{2}{3acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2cx^2\sqrt{c}}$$

$$= -\frac{2}{3acx\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3c\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2cx^2\sqrt{c}}$$

Mathematica [A] time = 12.34, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.60, size = 0, normalized size = 0.00

$$\int \frac{1}{x \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{5}{2}}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1099 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=227

$$\frac{44}{3}\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+\frac{8\sqrt{2\pi}\,a\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(a$$

```
[Out] -2/3/a/c/x^2/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)+8*a*FresnelC(2^(1/2)/Pi^
(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/c/(a^2*c*x^2+c)
^(1/2)+8/3/a^2/c/x^3/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)+4/c/x/(a^2*c*x^2
+c)^(1/2)/arctan(a*x)^(1/2)+8*Unintegrable(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan
(a*x)^(1/2),x)/a^2+44/3*Unintegrable(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^
(1/2),x)
```

Rubi [A] time = 0.83, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x^2*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) + 8/(3*a^2*c*x^3*Sqrt[
c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) + 4/(c*x*Sqrt[c + a^2*c*x^2]*Sqrt[ArcTan[
a*x]]) + (8*a*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sqrt[ArcTan[
a*x]]])/(c*Sqrt[c + a^2*c*x^2]) + (8*Defer[Int][1/(x^4*(c + a^2*c*x^2)^(3/2
)*Sqrt[ArcTan[a*x]]), x])/a^2 + (44*Defer[Int][1/(x^2*(c + a^2*c*x^2)^(3/2)
*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3acx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} - \frac{4\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a} - (2a)\int$$

$$= -\frac{2}{3acx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{cx\sqrt{c}}$$

$$= -\frac{2}{3acx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{cx\sqrt{c}}$$

$$= -\frac{2}{3acx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{cx\sqrt{c}}$$

$$= -\frac{2}{3acx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{cx\sqrt{c}}$$

$$= -\frac{2}{3acx^2\sqrt{c+a^2cx^2}\,\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\sqrt{c+a^2cx^2}\,\sqrt{\tan^{-1}(ax)}} + \frac{}{cx\sqrt{c}}$$

Mathematica [A] time = 13.95, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas"
)
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.88, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1100 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=202

$$16a^2\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{16\text{Int}\left(\frac{1}{x^5\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+\frac{92}{3}\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}\right.$$

```
[Out] -2/3/a/c/x^3/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)+4/a^2/c/x^4/(a^2*c*x^2+c
)^(1/2)/arctan(a*x)^(1/2)+16/3/c/x^2/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/2)+
16*Unintegrable(1/x^5/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)/a^2+92/3*Uni
ntegrable(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)+16*a^2*Unintegrabl
e(1/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.85, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x^3*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) + 4/(a^2*c*x^4*Sqrt[c
 + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) + 16/(3*c*x^2*Sqrt[c + a^2*c*x^2]*Sqrt[ArcT
an[a*x]]) + (16*Defer[Int][1/(x^5*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),
 x])/a^2 + (92*Defer[Int][1/(x^3*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]),
x])/3 + 16*a^2*Defer[Int][1/(x*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2}{3acx^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}-\frac{2\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx}{a}-\frac{1}{3}(8a)\int$$

$$=-\frac{2}{3acx^3\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}+\frac{4}{a^2cx^4\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{}{3cx^2\sqrt{c}}$$

Mathematica [A] time = 16.24, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 3.98, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c \,x^{2}+c \right)^{\frac{3}{2}} \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1101 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=206

$$\frac{80}{3}a^2\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{80\text{Int}\left(\frac{1}{x^6\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+52\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax}\right.$$

```
[Out] -2/3/a/c/x^4/arctan(a*x)^(3/2)/(a^2*c*x^2+c)^(1/2)+16/3/a^2/c/x^5/(a^2*c*x^
2+c)^(1/2)/arctan(a*x)^(1/2)+20/3/c/x^3/(a^2*c*x^2+c)^(1/2)/arctan(a*x)^(1/
2)+80/3*Unintegrable(1/x^6/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)/a^2+52*
Unintegrable(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)+80/3*a^2*Uninte
grable(1/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.85, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x^4*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2)) + 16/(3*a^2*c*x^5*Sqrt
[c + a^2*c*x^2]*Sqrt[ArcTan[a*x]]) + 20/(3*c*x^3*Sqrt[c + a^2*c*x^2]*Sqrt[A
rcTan[a*x]]) + (80*Defer[Int][1/(x^6*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]
]), x])/(3*a^2) + 52*Defer[Int][1/(x^4*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*
x]]), x] + (80*a^2*Defer[Int][1/(x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]
]), x])/3
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2}{3acx^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}-\frac{8\int \frac{1}{x^5\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a}-\frac{1}{3}(10a)\int$$

$$=-\frac{2}{3acx^4\sqrt{c+a^2cx^2}\tan^{-1}(ax)^{3/2}}+\frac{16}{3a^2cx^5\sqrt{c+a^2cx^2}\sqrt{\tan^{-1}(ax)}}+\frac{}{3cx^3\sqrt{}}$$

Mathematica [A] time = 28.50, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 7.53, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(a^2 c\, x^2+c\right)^{\frac{3}{2}} \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(5/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^4\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(3/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**(3/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1102 $\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=29

$$\text{Int}\left(\frac{x^m}{\left(a^2cx^2+c\right)^{5/2}\tan^{-1}(ax)^{5/2}},x\right)$$

```
[Out] Unintegrable(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
[Out] Defer[Int][x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)), x]
```

Rubi steps

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx=\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Mathematica [A] time = 1.15, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[x^m/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{a^2cx^2+c}\,x^m}{\left(a^6c^3x^6+3\,a^4c^3x^4+3\,a^2c^3x^2+c^3\right)\arctan\left(ax\right)^{\frac{5}{2}}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(a^2*c*x^2 + c)*x^m/((a^6*c^3*x^6 + 3*a^4*c^3*x^4 + 3*a^2*c^3*
x^2 + c^3)*arctan(a*x)^(5/2)), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 3.02, size = 0, normalized size = 0.00

$$\int \frac{x^m}{\left(a^2 c\, x^2 + c\right)^{\frac{5}{2}} \arctan\left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \frac{x^m}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^m/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1103 $\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=190

$$-\frac{4x^2}{a^2c\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{2x^3}{3ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{3/2}}-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{6\pi}\sqrt{a^2}\cdots}{\cdots}$$

```
[Out] -2/3*x^3/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)-FresnelS(2^(1/2)/Pi^(1/2
)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+
c)^(1/2)+FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2
*x^2+1)^(1/2)/a^4/c^2/(a^2*c*x^2+c)^(1/2)-4*x^2/a^2/c/(a^2*c*x^2+c)^(3/2)/a
rctan(a*x)^(1/2)
```

Rubi [A] time = 0.81, antiderivative size = 190, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.308$, Rules used = {4942, 4968, 4971, 4970, 3312, 3305, 3351, 4406}

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{6\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^4c^2\sqrt{a^2cx^2+c}}-\frac{2x^3}{3ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{3/2}}-\frac{\cdots}{a^2\cdots}$$

Antiderivative was successfully verified.

```
[In] Int[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^3)/(3*a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) - (4*x^2)/(a^2*c*(
c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) - (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*Fre
snelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]])/(a^4*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[
6*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a^4*c^2*Sq
rt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^3}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{2\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx}{a}$$

$$= -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - 4\int \frac{}{\left(c+\right.}$$

$$= -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a\right.}{}$$

$$= -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a\right.}{}$$

$$= -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a\right.}{}$$

$$= -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{\sqrt{1+a^2x}}{}$$

$$= -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{\left(2\sqrt{1+a\right.}{}$$

$$= -\frac{2x^3}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4x^2}{a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\sqrt{2\pi}\sqrt{1}}{}$$

Mathematica [C] time = 0.89, size = 255, normalized size = 1.34

$$\frac{\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^{3/2}\left(S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-3\sqrt{3}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)\right)-2a^2x^2\left(ax+6\tan^{-1}(ax)\right)-\left(\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^3/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*a^2*x^2*(a*x + 6*ArcTan[a*x]) + Sqrt[6*Pi]*(1 + a^2*x^2)^(3/2)*ArcTan[a
*x]^(3/2)*(-3*Sqrt[3]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] + FresnelS[Sqr
t[6/Pi]*Sqrt[ArcTan[a*x]]]) - (1 + a^2*x^2)^(3/2)*ArcTan[a*x]*(3*Sqrt[(-I)*
ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] + 3*Sqrt[I*ArcTan[a*x]]*Gamma[1/2
, I*ArcTan[a*x]] + Sqrt[3]*(Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3*I)*ArcTan
[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])))/(3*a^4*c*(c +
 a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**F**] time = 8.67, size = 0, normalized size = 0.00

$$\int \frac{x^{3}}{\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x^3/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1104 $\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=224

$$-\frac{2x^2}{3ac\left(a^2cx^2+c\right)^{3/2}\tan^{-1}(ax)^{3/2}}-\frac{8x}{3a^2c\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+\frac{4x^3}{3c\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}}{3a^3c^2}$$

```
[Out] -2/3*x^2/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)-1/3*FresnelC(2^(1/2)/Pi^
(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*
x^2+c)^(1/2)+FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*
(a^2*x^2+1)^(1/2)/a^3/c^2/(a^2*c*x^2+c)^(1/2)-8/3*x/a^2/c/(a^2*c*x^2+c)^(3/
2)/arctan(a*x)^(1/2)+4/3*x^3/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 1.14, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 10, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {4968, 4942, 4971, 4970, 4406, 3304, 3352, 4905, 4904, 3312}

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^3c^2\sqrt{a^2cx^2+c}}+\frac{\sqrt{6\pi}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^3c^2\sqrt{a^2cx^2+c}}+\frac{4x^3}{3c\left(a^2cx^2+c\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x^2)/(3*a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) - (8*x)/(3*a^2*c*(
c + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) + (4*x^3)/(3*c*(c + a^2*c*x^2)^(3/2
)*Sqrt[ArcTan[a*x]]) - (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sq
rt[ArcTan[a*x]]])/(3*a^3*c^2*Sqrt[c + a^2*c*x^2]) + (Sqrt[6*Pi]*Sqrt[1 + a^
2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a^3*c^2*Sqrt[c + a^2*c*x^2]
)
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4942

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((f_.)*(x_))^(m_.)*((d_) + (e_.
)*(x_)^2)^(q_.), x_Symbol] :> Simp[((f*x)^m*(d + e*x^2)^(q + 1)*(a + b*ArcT
an[c*x])^(p + 1))/(b*c*d*(p + 1)), x] - Dist[(f*m)/(b*c*(p + 1)), Int[(f*x)
^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] /; FreeQ[{a, b,
c, d, e, f, m, q}, x] && EqQ[e, c^2*d] && EqQ[m + 2*q + 2, 0] && LtQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x^2}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a} - \frac{1}{3}(2a)\int \frac{}{(c}$$

$$= -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c\left(c+\right.}$$

$$= -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c\left(c+\right.}$$

$$= -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c\left(c+\right.}$$

$$= -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c\left(c+\right.}$$

$$= -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c\left(c+\right.}$$

$$= -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c\left(c+\right.}$$

$$= -\frac{2x^2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{8x}{3a^2c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c\left(c+\right.}$$

Mathematica [C] time = 0.86, size = 311, normalized size = 1.39

$$\frac{\frac{-8ia^3x^3\left(i\tan^{-1}(ax)\right)^{3/2}-4a^2x^2\sqrt{i\tan^{-1}(ax)}-3a^2x^2\sqrt{3a^2x^2+3}\,\tan^{-1}(ax)^2\Gamma\left(\frac{1}{2},3i\tan^{-1}(ax)\right)+\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^2\Gamma\left(\frac{1}{2},i\tan^{-1}(ax)\right)-3i\sqrt{3}\left(a^2x^2+1\right)^{3}}{\sqrt{i\tan^{-1}(ax)}}}{6a^3c^2\left(a^2\right.}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-((1 + a^2*x^2)^(3/2)*((-I)*ArcTan[a*x])^(3/2)*Gamma[1/2, (-I)*ArcTan[a*x]
]) + (-4*a^2*x^2*Sqrt[I*ArcTan[a*x]] + (16*I)*a*x*(I*ArcTan[a*x])^(3/2) - (
8*I)*a^3*x^3*(I*ArcTan[a*x])^(3/2) + (1 + a^2*x^2)^(3/2)*ArcTan[a*x]^2*Gamm
a[1/2, I*ArcTan[a*x]] - (3*I)*Sqrt[3]*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]*Sqrt[
ArcTan[a*x]^2]*Gamma[1/2, (-3*I)*ArcTan[a*x]] - 3*Sqrt[3 + 3*a^2*x^2]*ArcTa
n[a*x]^2*Gamma[1/2, (3*I)*ArcTan[a*x]] - 3*a^2*x^2*Sqrt[3 + 3*a^2*x^2]*ArcT
an[a*x]^2*Gamma[1/2, (3*I)*ArcTan[a*x]])/Sqrt[I*ArcTan[a*x]])/(6*a^3*c^2*(1
 + a^2*x^2)*Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 8.92, size = 0, normalized size = 0.00

$$\int \frac{x^{2}}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
[Out] int(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2}{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(x^2/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
[Out] Timed out
```

3.1105 $\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=222

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^2c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{6\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^2\sqrt{a^2cx^2+c}}+\frac{8x^2}{3c\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{}{3ac}$$

```
[Out] -2/3*x/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)-1/3*FresnelS(2^(1/2)/Pi^(1
/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^
2+c)^(1/2)-FresnelS(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a
^2*x^2+1)^(1/2)/a^2/c^2/(a^2*c*x^2+c)^(1/2)-4/3/a^2/c/(a^2*c*x^2+c)^(3/2)/a
rctan(a*x)^(1/2)+8/3*x^2/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)
```

Rubi [A] time = 1.06, antiderivative size = 222, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 8, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4968, 4971, 4970, 3312, 3305, 3351, 4406, 4902}

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{3a^2c^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{6\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{a^2c^2\sqrt{a^2cx^2+c}}+\frac{8x^2}{3c\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{}{3ac}$$

Antiderivative was successfully verified.

```
[In] Int[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-2*x)/(3*a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) - 4/(3*a^2*c*(c + a^
2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) + (8*x^2)/(3*c*(c + a^2*c*x^2)^(3/2)*Sqrt
[ArcTan[a*x]]) - (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[Arc
Tan[a*x]]])/(3*a^2*c^2*Sqrt[c + a^2*c*x^2]) - (Sqrt[6*Pi]*Sqrt[1 + a^2*x^2]
*FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a^2*c^2*Sqrt[c + a^2*c*x^2])
```

Rule 3305

```
Int[sin[(e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> Dist[2/d
, Subst[Int[Sin[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d, e, f}
, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3351

```
Int[Sin[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lS[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
+ 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
+ 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
+ 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{x}{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{2\int \frac{1}{(c+a^2cx^2)^{5/2}\tan^{-1}(ax)^{3/2}}dx}{3a} - \frac{1}{3}(4a)\int \frac{}{(c}$$

$$= -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c(c+}$$

$$= -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c(c+}$$

$$= -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c(c+}$$

$$= -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c(c+}$$

$$= -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c(c+}$$

$$= -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c(c+}$$

$$= -\frac{2x}{3ac(c+a^2cx^2)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4}{3a^2c(c+a^2cx^2)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3c(c+}$$

Mathematica [C] time = 0.87, size = 261, normalized size = 1.18

$$\frac{4\sqrt{6\pi}\left(a^2x^2+1\right)^{3/2}\tan^{-1}(ax)^{3/2}\left(3\sqrt{3}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)-S\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)\right)-12\left(\left(2-4a^2x^2\right)\tan^{-1}(ax)+\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-12*(a*x + (2 - 4*a^2*x^2)*ArcTan[a*x]) + 4*Sqrt[6*Pi]*(1 + a^2*x^2)^(3/2)
*ArcTan[a*x]^(3/2)*(3*Sqrt[3]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcTan[a*x]]] - Fres
nelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]]) + 7*(1 + a^2*x^2)^(3/2)*ArcTan[a*x]*(3*
Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-I)*ArcTan[a*x]] + 3*Sqrt[I*ArcTan[a*x]]
*Gamma[1/2, I*ArcTan[a*x]] + Sqrt[3]*(Sqrt[(-I)*ArcTan[a*x]]*Gamma[1/2, (-3
*I)*ArcTan[a*x]] + Sqrt[I*ArcTan[a*x]]*Gamma[1/2, (3*I)*ArcTan[a*x]])))/(18
*a^2*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [F] time = 3.16, size = 0, normalized size = 0.00

$$\int \frac{x}{\left(a^{2} c \,x^{2}+c \right)^{\frac{5}{2}} \arctan \left(a x \right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x}{{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(x/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1106 $\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=183

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{6\pi}\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}+\frac{4x}{c\left(a^2cx^2+c\right)^{3/2}\sqrt{\tan^{-1}(ax)}}-\frac{}{3ac\,(}$$

```
[Out] -2/3/a/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)-FresnelC(2^(1/2)/Pi^(1/2)*ar
ctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/
2)-FresnelC(6^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1
)^(1/2)/a/c^2/(a^2*c*x^2+c)^(1/2)+4*x/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/
2)
```

Rubi [A] time = 0.62, antiderivative size = 183, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4902, 4968, 4971, 4970, 4406, 3304, 3352, 4905, 4904, 3312}

$$-\frac{\sqrt{2\pi}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}-\frac{\sqrt{6\pi}\sqrt{a^2x^2+1}\,\text{FresnelC}\left(\sqrt{\frac{6}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{ac^2\sqrt{a^2cx^2+c}}+\frac{4x}{c\left(a^2cx^2+c\right)^{3/2}\sqrt{\mathrm{t}}}$$

Antiderivative was successfully verified.

```
[In] Int[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) + (4*x)/(c*(c + a^2*c*x^
2)^(3/2)*Sqrt[ArcTan[a*x]]) - (Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2
/Pi]*Sqrt[ArcTan[a*x]]])/(a*c^2*Sqrt[c + a^2*c*x^2]) - (Sqrt[6*Pi]*Sqrt[1 +
 a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(a*c^2*Sqrt[c + a^2*c*x^2
])
```

Rule 3304

```
Int[sin[Pi/2 + (e_.) + (f_.)*(x_)]/Sqrt[(c_.) + (d_.)*(x_)], x_Symbol] :> D
ist[2/d, Subst[Int[Cos[(f*x^2)/d], x], x, Sqrt[c + d*x]], x] /; FreeQ[{c, d
, e, f}, x] && ComplexFreeQ[f] && EqQ[d*e - c*f, 0]
```

Rule 3312

```
Int[((c_.) + (d_.)*(x_))^(m_)*sin[(e_.) + (f_.)*(x_)]^(n_), x_Symbol] :> In
t[ExpandTrigReduce[(c + d*x)^m, Sin[e + f*x]^n, x], x] /; FreeQ[{c, d, e, f
, m}, x] && IGtQ[n, 1] && ( !RationalQ[m] || (GeQ[m, -1] && LtQ[m, 1]))
```

Rule 3352

```
Int[Cos[(d_.)*((e_.) + (f_.)*(x_))^2], x_Symbol] :> Simp[(Sqrt[Pi/2]*Fresne
lC[Sqrt[2/Pi]*Rt[d, 2]*(e + f*x)])/(f*Rt[d, 2]), x] /; FreeQ[{d, e, f}, x]
```

Rule 4406

```
Int[Cos[(a_.) + (b_.)*(x_)]^(p_.)*((c_.) + (d_.)*(x_))^(m_.)*Sin[(a_.) + (b
_.)*(x_)]^(n_.), x_Symbol] :> Int[ExpandTrigReduce[(c + d*x)^m, Sin[a + b*x
]^n*Cos[a + b*x]^p, x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[n, 0] && IG
tQ[p, 0]
```

Rule 4902

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_)^2)^(q_), x_S
ymbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p + 1))/(b*c*d*(p
 + 1)), x] - Dist[(2*c*(q + 1))/(b*(p + 1)), Int[x*(d + e*x^2)^q*(a + b*ArcT
an[c*x])^(p + 1), x], x] /; FreeQ[{a, b, c, d, e}, x] && EqQ[e, c^2*d] && L
tQ[q, -1] && LtQ[p, -1]
```

Rule 4904

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[d^q/c, Subst[Int[(a + b*x)^p/Cos[x]^(2*(q + 1)), x], x, Arc
Tan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}, x] && EqQ[e, c^2*d] && ILtQ[2*(q
 + 1), 0] && (IntegerQ[q] || GtQ[d, 0])
```

Rule 4905

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_), x_
Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2], Int[(1 + c
^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] &&
EqQ[e, c^2*d] && ILtQ[2*(q + 1), 0] &&  !(IntegerQ[q] || GtQ[d, 0])
```

Rule 4968

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Simp[(x^m*(d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x])^(p
 + 1))/(b*c*d*(p + 1)), x] + (-Dist[(c*(m + 2*q + 2))/(b*(p + 1)), Int[x^(m
 + 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x] - Dist[m/(b*c*(p + 1
)), Int[x^(m - 1)*(d + e*x^2)^q*(a + b*ArcTan[c*x])^(p + 1), x], x]) /; Fre
eQ[{a, b, c, d, e, m}, x] && EqQ[e, c^2*d] && IntegerQ[m] && LtQ[q, -1] &&
LtQ[p, -1] && NeQ[m + 2*q + 2, 0]
```

Rule 4970

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[d^q/c^(m + 1), Subst[Int[((a + b*x)^p*Sin[x]^m)/
Cos[x]^(m + 2*(q + 1)), x], x, ArcTan[c*x]], x] /; FreeQ[{a, b, c, d, e, p}
, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] && (IntegerQ[q]
 || GtQ[d, 0])
```

Rule 4971

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_)^(m_.)*((d_) + (e_.)*(x_)^
2)^(q_), x_Symbol] :> Dist[(d^(q + 1/2)*Sqrt[1 + c^2*x^2])/Sqrt[d + e*x^2],
 Int[x^m*(1 + c^2*x^2)^q*(a + b*ArcTan[c*x])^p, x], x] /; FreeQ[{a, b, c, d
, e, p}, x] && EqQ[e, c^2*d] && IGtQ[m, 0] && ILtQ[m + 2*q + 1, 0] &&  !(In
tegerQ[q] || GtQ[d, 0])
```

Rubi steps

$$\int \frac{1}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - (2a)\int \frac{x}{\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx$$

$$= -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - 4\int \frac{}{\left(c+a^2\right.}$$

$$= -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a^2x\right.}{}$$

$$= -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a^2x\right.}{}$$

$$= -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(4\sqrt{1+a^2x\right.}{}$$

$$= -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\sqrt{1+a^2x^2}}{}$$

$$= -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\left(2\sqrt{1+a^2x\right.}{}$$

$$= -\frac{2}{3ac\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{4x}{c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} - \frac{\sqrt{2\pi}\sqrt{1+}}{}$$

Mathematica [C] time = 0.53, size = 300, normalized size = 1.64

$$\frac{-3a^2x^2\sqrt{3a^2x^2+3}\left(-i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},-3i\tan^{-1}(ax)\right) - 3a^2x^2\sqrt{3a^2x^2+3}\left(i\tan^{-1}(ax)\right)^{3/2}\Gamma\left(\frac{1}{2},3i\tan^{-1}(ax)\right)}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[1/((c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] (-4 + 24*a*x*ArcTan[a*x] - 3*(1 + a^2*x^2)^(3/2)*((-I)*ArcTan[a*x])^(3/2)*G
amma[1/2, (-I)*ArcTan[a*x]] - 3*(1 + a^2*x^2)^(3/2)*(I*ArcTan[a*x])^(3/2)*G
amma[1/2, I*ArcTan[a*x]] - 3*Sqrt[3 + 3*a^2*x^2]*((-I)*ArcTan[a*x])^(3/2)*G
amma[1/2, (-3*I)*ArcTan[a*x]] - 3*a^2*x^2*Sqrt[3 + 3*a^2*x^2]*((-I)*ArcTan[
a*x])^(3/2)*Gamma[1/2, (-3*I)*ArcTan[a*x]] - 3*Sqrt[3 + 3*a^2*x^2]*(I*ArcTa
n[a*x])^(3/2)*Gamma[1/2, (3*I)*ArcTan[a*x]] - 3*a^2*x^2*Sqrt[3 + 3*a^2*x^2]
*(I*ArcTan[a*x])^(3/2)*Gamma[1/2, (3*I)*ArcTan[a*x]])/(6*c^2*(a + a^3*x^2)*
Sqrt[c + a^2*c*x^2]*ArcTan[a*x]^(3/2))
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
```

```
[Out] Exception raised: TypeError >> Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 1.43, size = 0, normalized size = 0.00

$$\int \frac{1}{\left(a^2c\,x^2+c\right)^{\frac{5}{2}}\arctan\left(ax\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
[Out] int(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{\mathrm{atan}\left(a\,x\right)^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
[Out] int(1/(atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
[Out] Timed out
```

3.1107 $\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=287

$$\frac{20}{3}\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+\frac{4\sqrt{2\pi}\sqrt{a^2x^2+1}\,S\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(ax)}\right)}{c^2\sqrt{a^2cx^2+c}}+$$

```
[Out] -2/3/a/c/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)+4/3*FresnelS(6^(1/2)/Pi^(1
/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)
^(1/2)+4*FresnelS(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1/2)*(a^2
*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+16/3/c/(a^2*c*x^2+c)^(3/2)/arctan(a*x
)^(1/2)+4/3/a^2/c/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)+8/3*Unintegrabl
e(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)/a^2+20/3*Unintegrable(1/x/
(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.77, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) + 16/(3*c*(c + a^2*c*x
^2)^(3/2)*Sqrt[ArcTan[a*x]]) + 4/(3*a^2*c*x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[Ar
cTan[a*x]]) + (4*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelS[Sqrt[2/Pi]*Sqrt[ArcT
an[a*x]]])/(c^2*Sqrt[c + a^2*c*x^2]) + (4*Sqrt[(2*Pi)/3]*Sqrt[1 + a^2*x^2]*
FresnelS[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(c^2*Sqrt[c + a^2*c*x^2]) + (8*Defe
r[Int][1/(x^3*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x])/(3*a^2) + (20*D
efer[Int][1/(x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{2\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a} - \frac{1}{3}(8a$$

$$= -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{16}{3c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c}$$

$$= -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{16}{3c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c}$$

$$= -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{16}{3c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c}$$

$$= -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{16}{3c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c}$$

$$= -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{16}{3c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c}$$

$$= -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{16}{3c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c}$$

$$= -\frac{2}{3acx\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{16}{3c\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} + \frac{}{3a^2c}$$

Mathematica [A] time = 12.98, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas")
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [A] time = 1.59, size = 0, normalized size = 0.00

$$\int \frac{1}{x\left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan\left(a x\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x\,\mathrm{atan}\left(a\,x\right)^{5/2}\,\left(c\,a^2\,x^2+c\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1108 $\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=292

$$\frac{68}{3}\mathrm{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{8\mathrm{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+\frac{20\sqrt{2\pi}\,a\sqrt{a^2x^2+1}\,C\left(\sqrt{\frac{2}{\pi}}\sqrt{\tan^{-1}(}\right.}{c^2\sqrt{a^2cx^2+c}}$$

```
[Out] -2/3/a/c/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)+20/9*a*FresnelC(6^(1/2)/
Pi^(1/2)*arctan(a*x)^(1/2))*6^(1/2)*Pi^(1/2)*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x
^2+c)^(1/2)+20*a*FresnelC(2^(1/2)/Pi^(1/2)*arctan(a*x)^(1/2))*2^(1/2)*Pi^(1
/2)*(a^2*x^2+1)^(1/2)/c^2/(a^2*c*x^2+c)^(1/2)+8/3/a^2/c/x^3/(a^2*c*x^2+c)^(
3/2)/arctan(a*x)^(1/2)+20/3/c/x/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)+8*Uni
ntegrable(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)/a^2+68/3*Unintegra
ble(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.93, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x^2*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) + 8/(3*a^2*c*x^3*(c
+ a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) + 20/(3*c*x*(c + a^2*c*x^2)^(3/2)*Sqr
t[ArcTan[a*x]]) + (20*a*Sqrt[2*Pi]*Sqrt[1 + a^2*x^2]*FresnelC[Sqrt[2/Pi]*Sq
rt[ArcTan[a*x]]])/(c^2*Sqrt[c + a^2*c*x^2]) + (20*a*Sqrt[(2*Pi)/3]*Sqrt[1 +
 a^2*x^2]*FresnelC[Sqrt[6/Pi]*Sqrt[ArcTan[a*x]]])/(3*c^2*Sqrt[c + a^2*c*x^2
]) + (8*Defer[Int][1/(x^4*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x])/a^2
 + (68*Defer[Int][1/(x^2*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x])/3
```

Rubi steps

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} - \frac{4\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a} - \frac{1}{3}(10a$$

$$= -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} +$$

$$= -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} +$$

$$= -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} +$$

$$= -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} +$$

$$= -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} +$$

$$= -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} +$$

$$= -\frac{2}{3acx^2\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}} + \frac{8}{3a^2cx^3\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}} +$$

Mathematica [A] time = 14.85, size = 0, normalized size = 0.00

$$\int \frac{1}{x^2\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
[Out] Integrate[1/(x^2*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas"
)
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.81, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{2} \left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^2\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x^2*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**2/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1109 $\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=198

$$40a^2\text{Int}\left(\frac{1}{x\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{16\text{Int}\left(\frac{1}{x^5\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{a^2}+44\text{Int}\left(\frac{1}{x^3\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}}\right.$$

```
[Out] -2/3/a/c/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)+4/a^2/c/x^4/(a^2*c*x^2+c
)^(3/2)/arctan(a*x)^(1/2)+8/c/x^2/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/2)+16*
Unintegrable(1/x^5/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)/a^2+44*Unintegr
able(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)+40*a^2*Unintegrable(1/x
/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.90, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x^3*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) + 4/(a^2*c*x^4*(c +
a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) + 8/(c*x^2*(c + a^2*c*x^2)^(3/2)*Sqrt[A
rcTan[a*x]]) + (16*Defer[Int][1/(x^5*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]
]), x])/a^2 + 44*Defer[Int][1/(x^3*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]])
, x] + 40*a^2*Defer[Int][1/(x*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx=-\frac{2}{3acx^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}-\frac{2\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx}{a}-(4a)\int$$

$$=-\frac{2}{3acx^3\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}+\frac{4}{a^2cx^4\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+-$$

Mathematica [A] time = 17.67, size = 0, normalized size = 0.00

$$\int \frac{1}{x^3\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^3*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] Exception raised: TypeError >> An error occurred running a Giac command:INP
UT:sage2:=int(sage0,x):;OUTPUT:sym2poly/r2sym(const gen & e,const index_m &
 i,const vecteur & l) Error: Bad Argument Value
```

maple [**A**] time = 3.81, size = 0, normalized size = 0.00

$$\int \frac{1}{x^{3} \left(a^{2} c\,x^{2}+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^3/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{1}{x^3\,{\mathrm{atan}\left(a\,x\right)}^{5/2}\,{\left(c\,a^2\,x^2+c\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x^3*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**3/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1110 $\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$

Optimal. Leaf size=206

$$56a^2\text{Int}\left(\frac{1}{x^2\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)+\frac{80\text{Int}\left(\frac{1}{x^6\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(ax)}},x\right)}{3a^2}+\frac{212}{3}\text{Int}\left(\frac{1}{x^4\left(a^2cx^2+c\right)^{5/2}\sqrt{\tan^{-1}(a}\right.$$

```
[Out] -2/3/a/c/x^4/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(3/2)+16/3/a^2/c/x^5/(a^2*c*x^
2+c)^(3/2)/arctan(a*x)^(1/2)+28/3/c/x^3/(a^2*c*x^2+c)^(3/2)/arctan(a*x)^(1/
2)+80/3*Unintegrable(1/x^6/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)/a^2+212
/3*Unintegrable(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)+56*a^2*Unint
egrable(1/x^2/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(1/2),x)
```

Rubi [A] time = 0.92, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] -2/(3*a*c*x^4*(c + a^2*c*x^2)^(3/2)*ArcTan[a*x]^(3/2)) + 16/(3*a^2*c*x^5*(c
 + a^2*c*x^2)^(3/2)*Sqrt[ArcTan[a*x]]) + 28/(3*c*x^3*(c + a^2*c*x^2)^(3/2)*
Sqrt[ArcTan[a*x]]) + (80*Defer[Int][1/(x^6*(c + a^2*c*x^2)^(5/2)*Sqrt[ArcTa
n[a*x]]), x])/(3*a^2) + (212*Defer[Int][1/(x^4*(c + a^2*c*x^2)^(5/2)*Sqrt[A
rcTan[a*x]]), x])/3 + 56*a^2*Defer[Int][1/(x^2*(c + a^2*c*x^2)^(5/2)*Sqrt[A
rcTan[a*x]]), x]
```

Rubi steps

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx = -\frac{2}{3acx^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}-\frac{8\int \frac{1}{x^5\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{3/2}}\,dx}{3a}-\frac{1}{3}(14a$$

$$= -\frac{2}{3acx^4\left(c+a^2cx^2\right)^{3/2}\tan^{-1}(ax)^{3/2}}+\frac{16}{3a^2cx^5\left(c+a^2cx^2\right)^{3/2}\sqrt{\tan^{-1}(ax)}}+$$

Mathematica [A] time = 33.16, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4\left(c+a^2cx^2\right)^{5/2}\tan^{-1}(ax)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)),x]
```

```
[Out] Integrate[1/(x^4*(c + a^2*c*x^2)^(5/2)*ArcTan[a*x]^(5/2)), x]
```

fricas [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: TypeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="fricas"
)
```

```
[Out] Exception raised: TypeError >>  Error detected within library code:   integ
rate: implementation incomplete (constant residues)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 7.45, size = 0, normalized size = 0.00

$$\int \frac{1}{x^4 \left(a^2 c\, x^2+c\right)^{\frac{5}{2}} \arctan \left(a x\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

```
[Out] int(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x^4/(a^2*c*x^2+c)^(5/2)/arctan(a*x)^(5/2),x, algorithm="maxima"
)
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{1}{x^4\, \mathrm{atan}\left(a\, x\right)^{5/2}\, {\left(c\, a^2\, x^2+c\right)}^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)),x)
```

```
[Out] int(1/(x^4*atan(a*x)^(5/2)*(c + a^2*c*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(1/x**4/(a**2*c*x**2+c)**(5/2)/atan(a*x)**(5/2),x)
```

```
[Out] Timed out
```

3.1111 $\int \frac{x\tan^{-1}(ax)^n}{c+a^2cx^2}\,dx$

Optimal. Leaf size=46

$$\frac{x\tan^{-1}(ax)^{n+1}}{ac(n+1)}-\frac{\operatorname{Int}\left(\tan^{-1}(ax)^{n+1},x\right)}{ac(n+1)}$$

```
[Out] x*arctan(a*x)^(1+n)/a/c/(1+n)-Unintegrable(arctan(a*x)^(1+n),x)/a/c/(1+n)
```

Rubi [A] time = 0.08, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x\tan^{-1}(ax)^n}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x*ArcTan[a*x]^n)/(c + a^2*c*x^2),x]
```

```
[Out] (x*ArcTan[a*x]^(1 + n))/(a*c*(1 + n)) - Defer[Int][ArcTan[a*x]^(1 + n), x]/
(a*c*(1 + n))
```

Rubi steps

$$\int \frac{x\tan^{-1}(ax)^n}{c+a^2cx^2}\,dx=\frac{x\tan^{-1}(ax)^{1+n}}{ac(1+n)}-\frac{\int \tan^{-1}(ax)^{1+n}\,dx}{ac(1+n)}$$

Mathematica [A] time = 0.95, size = 0, normalized size = 0.00

$$\int \frac{x\tan^{-1}(ax)^n}{c+a^2cx^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x*ArcTan[a*x]^n)/(c + a^2*c*x^2),x]
```

```
[Out] Integrate[(x*ArcTan[a*x]^n)/(c + a^2*c*x^2), x]
```

fricas [A] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{x\arctan(ax)^n}{a^2cx^2+c},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^n/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] integral(x*arctan(a*x)^n/(a^2*c*x^2 + c), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^n/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.80, size = 0, normalized size = 0.00

$$\int \frac{x \arctan \left(a x\right)^{n}}{a^{2} c \,x^{2}+c}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(a*x)^n/(a^2*c*x^2+c),x)
```

```
[Out] int(x*arctan(a*x)^n/(a^2*c*x^2+c),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(a*x)^n/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x\,{\mathrm{atan}\left(a\,x\right)}^n}{c\,a^2\,x^2+c} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*atan(a*x)^n)/(c + a^2*c*x^2),x)
```

```
[Out] int((x*atan(a*x)^n)/(c + a^2*c*x^2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{x \operatorname{atan}^{n}{\left (a x \right)}}{a^{2} x^{2} + 1}\, dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(a*x)**n/(a**2*c*x**2+c),x)
```

```
[Out] Integral(x*atan(a*x)**n/(a**2*x**2 + 1), x)/c
```

3.1112 $\int \frac{\tan^{-1}(ax)^n}{c+a^2cx^2} dx$

Optimal. Leaf size=20

$$\frac{\tan^{-1}(ax)^{n+1}}{ac(n+1)}$$

```
[Out] arctan(a*x)^(1+n)/a/c/(1+n)
```

Rubi [A] time = 0.04, antiderivative size = 20, normalized size of antiderivative = 1.00, number of steps used = 1, number of rules used = 1, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.053, Rules used = {4884}

$$\frac{\tan^{-1}(ax)^{n+1}}{ac(n+1)}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]^n/(c + a^2*c*x^2),x]
```

```
[Out] ArcTan[a*x]^(1 + n)/(a*c*(1 + n))
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)^n}{c + a^2cx^2} dx = \frac{\tan^{-1}(ax)^{1+n}}{ac(1+n)}$$

Mathematica [A] time = 0.00, size = 20, normalized size = 1.00

$$\frac{\tan^{-1}(ax)^{n+1}}{ac(n+1)}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]^n/(c + a^2*c*x^2),x]
```

```
[Out] ArcTan[a*x]^(1 + n)/(a*c*(1 + n))
```

fricas [A] time = 0.60, size = 21, normalized size = 1.05

$$\frac{\arctan(ax)^n \arctan(ax)}{acn + ac}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^n/(a^2*c*x^2+c),x, algorithm="fricas")
```

```
[Out] arctan(a*x)^n*arctan(a*x)/(a*c*n + a*c)
```

giac [A] time = 0.12, size = 20, normalized size = 1.00

$$\frac{\arctan(ax)^{n+1}}{ac(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^n/(a^2*c*x^2+c),x, algorithm="giac")
```

```
[Out] arctan(a*x)^(n + 1)/(a*c*(n + 1))
```

maple [A] time = 0.07, size = 21, normalized size = 1.05

$$\frac{\arctan(ax)^{1+n}}{ac(1+n)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)^n/(a^2*c*x^2+c),x)
```

```
[Out] arctan(a*x)^(1+n)/a/c/(1+n)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)^n/(a^2*c*x^2+c),x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: Error executing code in Maxima:
 expt: undefined: 0 to a negative exponent.
```

mupad [B] time = 0.36, size = 20, normalized size = 1.00

$$\frac{\operatorname{atan}(a\,x)^{n+1}}{a\,c\,(n+1)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)^n/(c + a^2*c*x^2),x)
```

```
[Out] atan(a*x)^(n + 1)/(a*c*(n + 1))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{\int \frac{\operatorname{atan}^{n}(ax)}{a^{2}x^{2}+1}\,dx}{c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)**n/(a**2*c*x**2+c),x)
```

```
[Out] Integral(atan(a*x)**n/(a**2*x**2 + 1), x)/c
```

3.1113 $\int (fx)^m \left(d+c^2dx^2\right)^q \left(a+b\tan^{-1}(cx)\right)^p\,dx$

Optimal. Leaf size=31

$$\mathrm{Int}\left((fx)^m \left(c^2dx^2+d\right)^q \left(a+b\tan^{-1}(cx)\right)^p, x\right)$$

```
[Out] Unintegrable((f*x)^m*(c^2*d*x^2+d)^q*(a+b*arctan(c*x))^p,x)
```

Rubi [A] time = 0.10, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int (fx)^m \left(d+c^2dx^2\right)^q \left(a+b\tan^{-1}(cx)\right)^p\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(f*x)^m*(d + c^2*d*x^2)^q*(a + b*ArcTan[c*x])^p,x]
[Out] Defer[Int][(f*x)^m*(d + c^2*d*x^2)^q*(a + b*ArcTan[c*x])^p, x]
```

Rubi steps

$$\int (fx)^m \left(d+c^2dx^2\right)^q \left(a+b\tan^{-1}(cx)\right)^p\,dx = \int (fx)^m \left(d+c^2dx^2\right)^q \left(a+b\tan^{-1}(cx)\right)^p\,dx$$

Mathematica [A] time = 0.72, size = 0, normalized size = 0.00

$$\int (fx)^m \left(d+c^2dx^2\right)^q \left(a+b\tan^{-1}(cx)\right)^p\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(f*x)^m*(d + c^2*d*x^2)^q*(a + b*ArcTan[c*x])^p,x]
[Out] Integrate[(f*x)^m*(d + c^2*d*x^2)^q*(a + b*ArcTan[c*x])^p, x]
```

fricas [A] time = 0.49, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\left(c^2dx^2+d\right)^q \left(fx\right)^m (b\arctan(cx)+a)^p, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(c^2*d*x^2+d)^q*(a+b*arctan(c*x))^p,x, algorithm="fricas"
)
[Out] integral((c^2*d*x^2 + d)^q*(f*x)^m*(b*arctan(c*x) + a)^p, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(c^2*d*x^2+d)^q*(a+b*arctan(c*x))^p,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 7.56, size = 0, normalized size = 0.00

$$\int \left(fx\right)^m \left(c^2d\,x^2+d\right)^q (a+b\arctan(cx))^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((f*x)^m*(c^2*d*x^2+d)^q*(a+b*arctan(c*x))^p,x)
```

```
[Out] int((f*x)^m*(c^2*d*x^2+d)^q*(a+b*arctan(c*x))^p,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(c^2dx^2+d\right)^q \left(fx\right)^m \left(b\arctan\left(cx\right)+a\right)^p\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)^m*(c^2*d*x^2+d)^q*(a+b*arctan(c*x))^p,x, algorithm="maxima"
)
```

```
[Out] integrate((c^2*d*x^2 + d)^q*(f*x)^m*(b*arctan(c*x) + a)^p, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.03

$$\int \left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^p\,\left(d\,c^2\,x^2+d\right)^q\,\left(f\,x\right)^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^p*(d + c^2*d*x^2)^q*(f*x)^m,x)
```

```
[Out] int((a + b*atan(c*x))^p*(d + c^2*d*x^2)^q*(f*x)^m, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((f*x)**m*(c**2*d*x**2+d)**q*(a+b*atan(c*x))**p,x)
```

```
[Out] Timed out
```

3.1114 $\int x^3 \left(d+ex^2\right) \left(a+b\tan^{-1}(cx)\right) \, dx$

Optimal. Leaf size=107

$$\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(3c^2d-2e\right)\tan^{-1}(cx)}{12c^6}+\frac{bx\left(3c^2d-2e\right)}{12c^5}-\frac{bx^3\left(3c^2d-2e\right)}{36c^3}-\frac{bex^5}{30c}$$

```
[Out] 1/12*b*(3*c^2*d-2*e)*x/c^5-1/36*b*(3*c^2*d-2*e)*x^3/c^3-1/30*b*e*x^5/c-1/12
*b*(3*c^2*d-2*e)*arctan(c*x)/c^6+1/4*d*x^4*(a+b*arctan(c*x))+1/6*e*x^6*(a+b
*arctan(c*x))
```

Rubi [A] time = 0.11, antiderivative size = 107, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4976, 459, 302, 203}

$$\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}ex^6\left(a+b\tan^{-1}(cx)\right)-\frac{bx^3\left(3c^2d-2e\right)}{36c^3}+\frac{bx\left(3c^2d-2e\right)}{12c^5}-\frac{b\left(3c^2d-2e\right)\tan^{-1}(cx)}{12c^6}-\frac{bex^5}{30c}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (b*(3*c^2*d - 2*e)*x)/(12*c^5) - (b*(3*c^2*d - 2*e)*x^3)/(36*c^3) - (b*e*x^
5)/(30*c) - (b*(3*c^2*d - 2*e)*ArcTan[c*x])/(12*c^6) + (d*x^4*(a + b*ArcTan
[c*x]))/4 + (e*x^6*(a + b*ArcTan[c*x]))/6
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
```

```
- 1)/2, 0]))
```

Rubi steps

$$\int x^3 \left(d + ex^2\right) \left(a + b \tan^{-1}(cx)\right) dx = \frac{1}{4} dx^4 \left(a + b \tan^{-1}(cx)\right) + \frac{1}{6} ex^6 \left(a + b \tan^{-1}(cx)\right) - (bc) \int \frac{x^4 \left(3d + 2ex^2\right.}{12 + 12c^2x^2}$$

$$= -\frac{bex^5}{30c} + \frac{1}{4} dx^4 \left(a + b \tan^{-1}(cx)\right) + \frac{1}{6} ex^6 \left(a + b \tan^{-1}(cx)\right) + \left(bc \left(-3d + \right.\right.$$

$$= -\frac{bex^5}{30c} + \frac{1}{4} dx^4 \left(a + b \tan^{-1}(cx)\right) + \frac{1}{6} ex^6 \left(a + b \tan^{-1}(cx)\right) + \left(bc \left(-3d + \right.\right.$$

$$= \frac{b \left(3d - \frac{2e}{c^2}\right) x}{12c^3} - \frac{b \left(3d - \frac{2e}{c^2}\right) x^3}{36c} - \frac{bex^5}{30c} + \frac{1}{4} dx^4 \left(a + b \tan^{-1}(cx)\right) + \frac{1}{6} ex^6$$

$$= \frac{b \left(3d - \frac{2e}{c^2}\right) x}{12c^3} - \frac{b \left(3d - \frac{2e}{c^2}\right) x^3}{36c} - \frac{bex^5}{30c} - \frac{b \left(3d - \frac{2e}{c^2}\right) \tan^{-1}(cx)}{12c^4} + \frac{1}{4} dx^4 \left(\right.$$

Mathematica [A] time = 0.01, size = 127, normalized size = 1.19

$$\frac{1}{4} adx^4 + \frac{1}{6} aex^6 + \frac{be \tan^{-1}(cx)}{6c^6} - \frac{bex}{6c^5} - \frac{bd \tan^{-1}(cx)}{4c^4} + \frac{bdx}{4c^3} + \frac{bex^3}{18c^3} + \frac{1}{4} bdx^4 \tan^{-1}(cx) - \frac{bdx^3}{12c} + \frac{1}{6} bex^6 \tan^{-1}(cx) - \frac{bex^5}{30c}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (b*d*x)/(4*c^3) - (b*e*x)/(6*c^5) - (b*d*x^3)/(12*c) + (b*e*x^3)/(18*c^3) +
 (a*d*x^4)/4 - (b*e*x^5)/(30*c) + (a*e*x^6)/6 - (b*d*ArcTan[c*x])/(4*c^4) +
 (b*e*ArcTan[c*x])/(6*c^6) + (b*d*x^4*ArcTan[c*x])/4 + (b*e*x^6*ArcTan[c*x]
)/6
```

fricas [A] time = 0.45, size = 110, normalized size = 1.03

$$\frac{30\, ac^6ex^6 + 45\, ac^6dx^4 - 6\, bc^5ex^5 - 5 \left(3\, bc^5d - 2\, bc^3e\right)x^3 + 15 \left(3\, bc^3d - 2\, bce\right)x + 15 \left(2\, bc^6ex^6 + 3\, bc^6dx^4 - 3\, bc\right.}{180\, c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/180*(30*a*c^6*e*x^6 + 45*a*c^6*d*x^4 - 6*b*c^5*e*x^5 - 5*(3*b*c^5*d - 2*b
*c^3*e)*x^3 + 15*(3*b*c^3*d - 2*b*c*e)*x + 15*(2*b*c^6*e*x^6 + 3*b*c^6*d*x^
4 - 3*b*c^2*d + 2*b*e)*arctan(c*x))/c^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 106, normalized size = 0.99

$$\frac{ae\,x^6}{6} + \frac{a\,x^4 d}{4} + \frac{b \arctan(cx)\, e\, x^6}{6} + \frac{b \arctan(cx)\, x^4 d}{4} - \frac{be\,x^5}{30c} - \frac{bd\,x^3}{12c} + \frac{b\,x^3 e}{18c^3} + \frac{bdx}{4c^3} - \frac{bex}{6c^5} - \frac{bd \arctan(cx)}{4c^4} + \frac{b \arctan(}{6c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)*(a+b*arctan(c*x)),x)
```

```
[Out] 1/6*a*e*x^6+1/4*a*x^4*d+1/6*b*arctan(c*x)*e*x^6+1/4*b*arctan(c*x)*x^4*d-1/3
0*b*e*x^5/c-1/12*b*d*x^3/c+1/18/c^3*b*x^3*e+1/4*b*d*x/c^3-1/6/c^5*b*e*x-1/4
*b*d*arctan(c*x)/c^4+1/6/c^6*b*arctan(c*x)*e
```

maxima [A] time = 0.41, size = 108, normalized size = 1.01

$$\frac{1}{6}aex^6+\frac{1}{4}adx^4+\frac{1}{12}\left(3x^4\arctan(cx)-c\left(\frac{c^2x^3-3x}{c^4}+\frac{3\arctan(cx)}{c^5}\right)\right)bd+\frac{1}{90}\left(15x^6\arctan(cx)-c\left(\frac{3c^4x^5-5c^2}{c^6}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*e*x^6 + 1/4*a*d*x^4 + 1/12*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^
4 + 3*arctan(c*x)/c^5))*b*d + 1/90*(15*x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*
c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*e
```

mupad [B] time = 0.62, size = 105, normalized size = 0.98

$$\frac{a\,d\,x^4}{4}+\frac{a\,e\,x^6}{6}+\frac{b\,d\,x}{4\,c^3}-\frac{b\,e\,x}{6\,c^5}-\frac{b\,d\,\mathrm{atan}\left(c\,x\right)}{4\,c^4}+\frac{b\,e\,\mathrm{atan}\left(c\,x\right)}{6\,c^6}+\frac{b\,d\,x^4\,\mathrm{atan}\left(c\,x\right)}{4}+\frac{b\,e\,x^6\,\mathrm{atan}\left(c\,x\right)}{6}-\frac{b\,d\,x^3}{12\,c}-\frac{b\,e\,x^5}{30\,c}+\frac{b\,e\,x^3}{18\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + e*x^2),x)
```

```
[Out] (a*d*x^4)/4 + (a*e*x^6)/6 + (b*d*x)/(4*c^3) - (b*e*x)/(6*c^5) - (b*d*atan(c
*x))/(4*c^4) + (b*e*atan(c*x))/(6*c^6) + (b*d*x^4*atan(c*x))/4 + (b*e*x^6*a
tan(c*x))/6 - (b*d*x^3)/(12*c) - (b*e*x^5)/(30*c) + (b*e*x^3)/(18*c^3)
```

sympy [A] time = 2.00, size = 138, normalized size = 1.29

$$\begin{cases} \frac{adx^4}{4}+\frac{aex^6}{6}+\frac{bdx^4\,\mathrm{atan}\,(cx)}{4}+\frac{bex^6\,\mathrm{atan}\,(cx)}{6}-\frac{bdx^3}{12c}-\frac{bex^5}{30c}+\frac{bdx}{4c^3}+\frac{bex^3}{18c^3}-\frac{bd\,\mathrm{atan}\,(cx)}{4c^4}-\frac{bex}{6c^5}+\frac{be\,\mathrm{atan}\,(cx)}{6c^6} & \text{for}\ c\neq 0 \\ a\left(\frac{dx^4}{4}+\frac{ex^6}{6}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d*x**4/4 + a*e*x**6/6 + b*d*x**4*atan(c*x)/4 + b*e*x**6*atan(c
*x)/6 - b*d*x**3/(12*c) - b*e*x**5/(30*c) + b*d*x/(4*c**3) + b*e*x**3/(18*c
**3) - b*d*atan(c*x)/(4*c**4) - b*e*x/(6*c**5) + b*e*atan(c*x)/(6*c**6), Ne
(c, 0)), (a*(d*x**4/4 + e*x**6/6), True))
```

3.1115 $\int x^2 \left(d+ex^2\right) \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=94

$$\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{b\left(5c^2d-3e\right)\log\left(c^2x^2+1\right)}{30c^5}-\frac{bx^2\left(5c^2d-3e\right)}{30c^3}-\frac{bex^4}{20c}$$

```
[Out] -1/30*b*(5*c^2*d-3*e)*x^2/c^3-1/20*b*e*x^4/c+1/3*d*x^3*(a+b*arctan(c*x))+1/
5*e*x^5*(a+b*arctan(c*x))+1/30*b*(5*c^2*d-3*e)*ln(c^2*x^2+1)/c^5
```

Rubi [A] time = 0.14, antiderivative size = 94, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}} = 0.210$, Rules used = {14, 4976, 446, 77}

$$\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}ex^5\left(a+b\tan^{-1}(cx)\right)-\frac{bx^2\left(5c^2d-3e\right)}{30c^3}+\frac{b\left(5c^2d-3e\right)\log\left(c^2x^2+1\right)}{30c^5}-\frac{bex^4}{20c}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(5*c^2*d - 3*e)*x^2)/(30*c^3) - (b*e*x^4)/(20*c) + (d*x^3*(a + b*ArcTan
[c*x]))/3 + (e*x^5*(a + b*ArcTan[c*x]))/5 + (b*(5*c^2*d - 3*e)*Log[1 + c^2*
x^2])/(30*c^5)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^2 \left(d+ex^2\right) \left(a+b\tan^{-1}(cx)\right) dx = \frac{1}{3}dx^3 \left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}ex^5 \left(a+b\tan^{-1}(cx)\right)-(bc)\int \frac{x^3 \left(5d+3ex^2\right)}{15+15c^2x^2} d$$
$$= \frac{1}{3}dx^3 \left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}ex^5 \left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{x(5d+}{15+1}\right.$$
$$= \frac{1}{3}dx^3 \left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}ex^5 \left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int \left(\frac{5c^2d-}{15c}\right.\right.$$
$$= -\frac{b\left(5c^2d-3e\right)x^2}{30c^3}-\frac{bex^4}{20c}+\frac{1}{3}dx^3 \left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}ex^5 \left(a+b\tan^{-1}(cx\right.$$

Mathematica [A] time = 0.02, size = 119, normalized size = 1.27

$$\frac{1}{3}adx^3+\frac{1}{5}aex^5+\frac{bex^2}{10c^3}-\frac{be\log\left(c^2x^2+1\right)}{10c^5}+\frac{bd\log\left(c^2x^2+1\right)}{6c^3}+\frac{1}{3}bdx^3\tan^{-1}(cx)-\frac{bdx^2}{6c}+\frac{1}{5}bex^5\tan^{-1}(cx)-\frac{bex^4}{20c}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -1/6*(b*d*x^2)/c + (b*e*x^2)/(10*c^3) + (a*d*x^3)/3 - (b*e*x^4)/(20*c) + (a
*e*x^5)/5 + (b*d*x^3*ArcTan[c*x])/3 + (b*e*x^5*ArcTan[c*x])/5 + (b*d*Log[1
+ c^2*x^2])/(6*c^3) - (b*e*Log[1 + c^2*x^2])/(10*c^5)
```

fricas [A] time = 0.48, size = 107, normalized size = 1.14

$$\frac{12\,ac^5ex^5+20\,ac^5dx^3-3\,bc^4ex^4-2\left(5\,bc^4d-3\,bc^2e\right)x^2+4\left(3\,bc^5ex^5+5\,bc^5dx^3\right)\arctan(cx)+2\left(5\,bc^2d-3\,be\right)l}{60\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/60*(12*a*c^5*e*x^5 + 20*a*c^5*d*x^3 - 3*b*c^4*e*x^4 - 2*(5*b*c^4*d - 3*b*
c^2*e)*x^2 + 4*(3*b*c^5*e*x^5 + 5*b*c^5*d*x^3)*arctan(c*x) + 2*(5*b*c^2*d -
 3*b*e)*log(c^2*x^2 + 1))/c^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 102, normalized size = 1.09

$$\frac{ae\,x^5}{5}+\frac{ad\,x^3}{3}+\frac{be\,x^5\arctan(cx)}{5}+\frac{b\arctan(cx)\,d\,x^3}{3}-\frac{bd\,x^2}{6c}-\frac{be\,x^4}{20c}+\frac{be\,x^2}{10c^3}+\frac{bd\ln\left(c^2x^2+1\right)}{6c^3}-\frac{be\ln\left(c^2x^2+1\right)}{10c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)*(a+b*arctan(c*x)),x)
```

```
[Out] 1/5*a*e*x^5+1/3*a*d*x^3+1/5*b*e*x^5*arctan(c*x)+1/3*b*arctan(c*x)*d*x^3-1/6
*b*d*x^2/c-1/20*b*e*x^4/c+1/10*b*e*x^2/c^3+1/6*b*d*ln(c^2*x^2+1)/c^3-1/10*b
*e*ln(c^2*x^2+1)/c^5
```

maxima [A] time = 0.31, size = 105, normalized size = 1.12

$$\frac{1}{5}\,aex^5+\frac{1}{3}\,adx^3+\frac{1}{6}\left(2\,x^3\arctan\left(cx\right)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)bd+\frac{1}{20}\left(4\,x^5\arctan\left(cx\right)-c\left(\frac{c^2x^4-2\,x^2}{c^4}+\frac{2\,\mathrm{lo}}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e*x^5 + 1/3*a*d*x^3 + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x
^2 + 1)/c^4))*b*d + 1/20*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*
log(c^2*x^2 + 1)/c^6))*b*e
```

mupad [B] time = 0.57, size = 101, normalized size = 1.07

$$\frac{a\,d\,x^3}{3}+\frac{a\,e\,x^5}{5}+\frac{b\,d\,x^3\,\mathrm{atan}\left(c\,x\right)}{3}+\frac{b\,e\,x^5\,\mathrm{atan}\left(c\,x\right)}{5}+\frac{b\,d\,\ln\left(c^2\,x^2+1\right)}{6\,c^3}-\frac{b\,e\,\ln\left(c^2\,x^2+1\right)}{10\,c^5}-\frac{b\,d\,x^2}{6\,c}-\frac{b\,e\,x^4}{20\,c}+\frac{b\,e\,x^2}{10\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + e*x^2),x)
```

```
[Out] (a*d*x^3)/3 + (a*e*x^5)/5 + (b*d*x^3*atan(c*x))/3 + (b*e*x^5*atan(c*x))/5 +
 (b*d*log(c^2*x^2 + 1))/(6*c^3) - (b*e*log(c^2*x^2 + 1))/(10*c^5) - (b*d*x^
2)/(6*c) - (b*e*x^4)/(20*c) + (b*e*x^2)/(10*c^3)
```

sympy [A] time = 1.38, size = 128, normalized size = 1.36

$$\begin{cases} \frac{adx^3}{3}+\frac{aex^5}{5}+\frac{bdx^3\,\mathrm{atan}\,(cx)}{3}+\frac{bex^5\,\mathrm{atan}\,(cx)}{5}-\frac{bdx^2}{6c}-\frac{bex^4}{20c}+\frac{bd\log\left(x^2+\frac{1}{c^2}\right)}{6c^3}+\frac{bex^2}{10c^3}-\frac{be\log\left(x^2+\frac{1}{c^2}\right)}{10c^5} & \text{for } c\neq 0 \\ a\left(\frac{dx^3}{3}+\frac{ex^5}{5}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d*x**3/3 + a*e*x**5/5 + b*d*x**3*atan(c*x)/3 + b*e*x**5*atan(c
*x)/5 - b*d*x**2/(6*c) - b*e*x**4/(20*c) + b*d*log(x**2 + c**(-2))/(6*c**3)
 + b*e*x**2/(10*c**3) - b*e*log(x**2 + c**(-2))/(10*c**5), Ne(c, 0)), (a*(d
*x**3/3 + e*x**5/5), True))
```

3.1116 $\int x\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=82

$$\frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{4e}-\frac{b\left(c^2d-e\right)^2\tan^{-1}(cx)}{4c^4e}-\frac{bx\left(2c^2d-e\right)}{4c^3}-\frac{bex^3}{12c}$$

```
[Out] -1/4*b*(2*c^2*d-e)*x/c^3-1/12*b*e*x^3/c-1/4*b*(c^2*d-e)^2*arctan(c*x)/c^4/e
+1/4*(e*x^2+d)^2*(a+b*arctan(c*x))/e
```

Rubi [A] time = 0.07, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 17, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.176, Rules used = {4974, 390, 203}

$$\frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{4e}-\frac{bx\left(2c^2d-e\right)}{4c^3}-\frac{b\left(c^2d-e\right)^2\tan^{-1}(cx)}{4c^4e}-\frac{bex^3}{12c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(2*c^2*d - e)*x)/(4*c^3) - (b*e*x^3)/(12*c) - (b*(c^2*d - e)^2*ArcTan[c
*x])/(4*c^4*e) + ((d + e*x^2)^2*(a + b*ArcTan[c*x]))/(4*e)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Int[PolynomialDivide[(a + b*x^n)^p, (c + d*x^n)^(-q), x], x] /; FreeQ[{a
, b, c, d}, x] && NeQ[b*c - a*d, 0] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[q,
0] && GeQ[p, -q]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)\,dx=\frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{4e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^2}{1+c^2x^2}\,dx}{4e}$$

$$=\frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{4e}-\frac{(bc)\int\left(\frac{\left(2c^2d-e\right)e}{c^4}+\frac{e^2x^2}{c^2}+\frac{c^4d^2-2c^2de+e^2}{c^4\left(1+c^2x^2\right)}\right)dx}{4e}$$

$$=-\frac{b\left(2c^2d-e\right)x}{4c^3}-\frac{bex^3}{12c}+\frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{4e}-\frac{\left(b\left(c^2d-e\right)^2\right)\int\frac{}{1+}$$

$$=-\frac{b\left(2c^2d-e\right)x}{4c^3}-\frac{bex^3}{12c}-\frac{b\left(c^2d-e\right)^2\tan^{-1}(cx)}{4c^4e}+\frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(c\right.}{4e}$$

Mathematica [A] time = 0.00, size = 103, normalized size = 1.26

$$\frac{1}{2}adx^2+\frac{1}{4}aex^4-\frac{be\tan^{-1}(cx)}{4c^4}+\frac{bex}{4c^3}+\frac{bd\tan^{-1}(cx)}{2c^2}+\frac{1}{2}bdx^2\tan^{-1}(cx)-\frac{bdx}{2c}+\frac{1}{4}bex^4\tan^{-1}(cx)-\frac{bex^3}{12c}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -1/2*(b*d*x)/c + (b*e*x)/(4*c^3) + (a*d*x^2)/2 - (b*e*x^3)/(12*c) + (a*e*x^
4)/4 + (b*d*ArcTan[c*x])/(2*c^2) - (b*e*ArcTan[c*x])/(4*c^4) + (b*d*x^2*Arc
Tan[c*x])/2 + (b*e*x^4*ArcTan[c*x])/4
```

fricas [A] time = 0.48, size = 89, normalized size = 1.09

$$\frac{3\,ac^4ex^4+6\,ac^4dx^2-bc^3ex^3-3\left(2\,bc^3d-bce\right)x+3\left(bc^4ex^4+2\,bc^4dx^2+2\,bc^2d-be\right)\arctan\left(cx\right)}{12\,c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/12*(3*a*c^4*e*x^4 + 6*a*c^4*d*x^2 - b*c^3*e*x^3 - 3*(2*b*c^3*d - b*c*e)*x
 + 3*(b*c^4*e*x^4 + 2*b*c^4*d*x^2 + 2*b*c^2*d - b*e)*arctan(c*x))/c^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 86, normalized size = 1.05

$$\frac{ae\,x^4}{4}+\frac{a\,x^2d}{2}+\frac{b\arctan\left(cx\right)e\,x^4}{4}+\frac{b\arctan\left(cx\right)d\,x^2}{2}-\frac{be\,x^3}{12c}-\frac{bdx}{2c}+\frac{bex}{4c^3}+\frac{bd\arctan\left(cx\right)}{2c^2}-\frac{be\arctan\left(cx\right)}{4c^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)*(a+b*arctan(c*x)),x)
```

```
[Out] 1/4*a*e*x^4+1/2*a*x^2*d+1/4*b*arctan(c*x)*e*x^4+1/2*b*arctan(c*x)*d*x^2-1/1
2*b*e*x^3/c-1/2*b*d*x/c+1/4*b*e*x/c^3+1/2*b*d*arctan(c*x)/c^2-1/4*b*e*arcta
n(c*x)/c^4
```

maxima [A] time = 0.42, size = 88, normalized size = 1.07

$$\frac{1}{4}\,aex^4+\frac{1}{2}\,adx^2+\frac{1}{2}\left(x^2\arctan\left(cx\right)-c\left(\frac{x}{c^2}-\frac{\arctan\left(cx\right)}{c^3}\right)\right)bd+\frac{1}{12}\left(3\,x^4\arctan\left(cx\right)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3\,\arctan\left(\right.}{c^5}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/4*a*e*x^4 + 1/2*a*d*x^2 + 1/2*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c
^3))*b*d + 1/12*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)
/c^5))*b*e
```

mupad [B] time = 0.29, size = 85, normalized size = 1.04

$$\frac{a\,d\,x^2}{2}+\frac{a\,e\,x^4}{4}-\frac{b\,d\,x}{2\,c}+\frac{b\,e\,x}{4\,c^3}+\frac{b\,d\,\mathrm{atan}\left(c\,x\right)}{2\,c^2}-\frac{b\,e\,\mathrm{atan}\left(c\,x\right)}{4\,c^4}+\frac{b\,d\,x^2\,\mathrm{atan}\left(c\,x\right)}{2}+\frac{b\,e\,x^4\,\mathrm{atan}\left(c\,x\right)}{4}-\frac{b\,e\,x^3}{12\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*x^2),x)
```

```
[Out] (a*d*x^2)/2 + (a*e*x^4)/4 - (b*d*x)/(2*c) + (b*e*x)/(4*c^3) + (b*d*atan(c*x
))/(2*c^2) - (b*e*atan(c*x))/(4*c^4) + (b*d*x^2*atan(c*x))/2 + (b*e*x^4*ata
n(c*x))/4 - (b*e*x^3)/(12*c)
```

sympy [A] time = 1.18, size = 114, normalized size = 1.39

$$\begin{cases} \frac{adx^2}{2} + \frac{aex^4}{4} + \frac{bdx^2 \operatorname{atan}(cx)}{2} + \frac{bex^4 \operatorname{atan}(cx)}{4} - \frac{bdx}{2c} - \frac{bex^3}{12c} + \frac{bd \operatorname{atan}(cx)}{2c^2} + \frac{bex}{4c^3} - \frac{be \operatorname{atan}(cx)}{4c^4} & \text{for}\ c \neq 0 \\ a\left(\frac{dx^2}{2} + \frac{ex^4}{4}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d*x**2/2 + a*e*x**4/4 + b*d*x**2*atan(c*x)/2 + b*e*x**4*atan(c
*x)/4 - b*d*x/(2*c) - b*e*x**3/(12*c) + b*d*atan(c*x)/(2*c**2) + b*e*x/(4*c
**3) - b*e*atan(c*x)/(4*c**4), Ne(c, 0)), (a*(d*x**2/2 + e*x**4/4), True))
```

3.1117 $\int \left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=68

$$dx\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(3c^2d-e\right)\log\left(c^2x^2+1\right)}{6c^3}-\frac{bex^2}{6c}$$

```
[Out] -1/6*b*e*x^2/c+d*x*(a+b*arctan(c*x))+1/3*e*x^3*(a+b*arctan(c*x))-1/6*b*(3*c
^2*d-e)*ln(c^2*x^2+1)/c^3
```

Rubi [A] time = 0.07, antiderivative size = 68, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 4, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.250, Rules used = {4912, 1593, 444, 43}

$$dx\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(3c^2d-e\right)\log\left(c^2x^2+1\right)}{6c^3}-\frac{bex^2}{6c}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*e*x^2)/(6*c) + d*x*(a + b*ArcTan[c*x]) + (e*x^3*(a + b*ArcTan[c*x]))/3
- (b*(3*c^2*d - e)*Log[1 + c^2*x^2])/(6*c^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 1593

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.))^(n_.), x_Symbol] :> Int[u*x
^(n*p)*(a + b*x^(q - p))^n, x] /; FreeQ[{a, b, p, q}, x] && IntegerQ[n] &&
PosQ[q - p]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rubi steps

$$\int \left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)dx = dx\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)-(bc)\int \frac{dx+\frac{ex^3}{3}}{1+c^2x^2}dx$$
$$= dx\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)-(bc)\int \frac{x\left(d+\frac{ex^2}{3}\right)}{1+c^2x^2}dx$$
$$= dx\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{d+\frac{ex}{3}}{1+c^2x}dx, x\right.$$
$$= dx\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int\left(\frac{e}{3c^2}+\frac{3c}{3c^2(}\right.\right.$$
$$= -\frac{bex^2}{6c}+dx\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(3c^2d-e\right)\log\left(1+\right.}{6c^3}$$

Mathematica [A] time = 0.01, size = 85, normalized size = 1.25

$$adx+\frac{1}{3}aex^3-\frac{bd\log\left(c^2x^2+1\right)}{2c}+\frac{be\log\left(c^2x^2+1\right)}{6c^3}+bdx\tan^{-1}(cx)+\frac{1}{3}bex^3\tan^{-1}(cx)-\frac{bex^2}{6c}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] a*d*x - (b*e*x^2)/(6*c) + (a*e*x^3)/3 + b*d*x*ArcTan[c*x] + (b*e*x^3*ArcTan
[c*x])/3 - (b*d*Log[1 + c^2*x^2])/(2*c) + (b*e*Log[1 + c^2*x^2])/(6*c^3)
```

fricas [A] time = 0.46, size = 82, normalized size = 1.21

$$\frac{2\,ac^3ex^3+6\,ac^3dx-bc^2ex^2+2\left(bc^3ex^3+3\,bc^3dx\right)\arctan(cx)-\left(3\,bc^2d-be\right)\log\left(c^2x^2+1\right)}{6\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/6*(2*a*c^3*e*x^3 + 6*a*c^3*d*x - b*c^2*e*x^2 + 2*(b*c^3*e*x^3 + 3*b*c^3*d
*x)*arctan(c*x) - (3*b*c^2*d - b*e)*log(c^2*x^2 + 1))/c^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 76, normalized size = 1.12

$$\frac{ae\,x^3}{3}+adx+\frac{be\,x^3\arctan(cx)}{3}+b\arctan(cx)\,dx-\frac{be\,x^2}{6c}-\frac{bd\ln\left(c^2x^2+1\right)}{2c}+\frac{be\ln\left(c^2x^2+1\right)}{6c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x)),x)
```

```
[Out] 1/3*a*e*x^3+a*d*x+1/3*b*e*x^3*arctan(c*x)+b*arctan(c*x)*d*x-1/6*b*e*x^2/c-1
/2*b*d*ln(c^2*x^2+1)/c+1/6*b*e*ln(c^2*x^2+1)/c^3
```

maxima [A] time = 0.31, size = 80, normalized size = 1.18

$$\frac{1}{3}aex^3+\frac{1}{6}\left(2x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)be+adx+\frac{\left(2cx\arctan(cx)-\log\left(c^2x^2+1\right)\right)bd}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/3*a*e*x^3 + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*
b*e + a*d*x + 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d/c
```

mupad [B] time = 0.52, size = 75, normalized size = 1.10

$$a\,d\,x+\frac{a\,e\,x^3}{3}+b\,d\,x\,\mathrm{atan}(c\,x)+\frac{b\,e\,x^3\,\mathrm{atan}(c\,x)}{3}-\frac{b\,d\,\ln\left(c^2\,x^2+1\right)}{2\,c}+\frac{b\,e\,\ln\left(c^2\,x^2+1\right)}{6\,c^3}-\frac{b\,e\,x^2}{6\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*x^2),x)
```

```
[Out] a*d*x + (a*e*x^3)/3 + b*d*x*atan(c*x) + (b*e*x^3*atan(c*x))/3 - (b*d*log(c^
2*x^2 + 1))/(2*c) + (b*e*log(c^2*x^2 + 1))/(6*c^3) - (b*e*x^2)/(6*c)
```

sympy [A] time = 0.71, size = 94, normalized size = 1.38

$$\begin{cases} adx+\frac{aex^3}{3}+bdx\,\mathrm{atan}(cx)+\frac{bex^3\,\mathrm{atan}(cx)}{3}-\frac{bd\log\left(x^2+\frac{1}{c^2}\right)}{2c}-\frac{bex^2}{6c}+\frac{be\log\left(x^2+\frac{1}{c^2}\right)}{6c^3} & \text{for } c\neq 0 \\ a\left(dx+\frac{ex^3}{3}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d*x + a*e*x**3/3 + b*d*x*atan(c*x) + b*e*x**3*atan(c*x)/3 - b*
d*log(x**2 + c**(-2))/(2*c) - b*e*x**2/(6*c) + b*e*log(x**2 + c**(-2))/(6*c
**3), Ne(c, 0)), (a*(d*x + e*x**3/3), True))
```

3.1118 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=77

$$\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+ad\log(x)+\frac{be\tan^{-1}(cx)}{2c^2}+\frac{1}{2}ibd\text{Li}_2(-icx)-\frac{1}{2}ibd\text{Li}_2(icx)-\frac{bex}{2c}$$

```
[Out] -1/2*b*e*x/c+1/2*b*e*arctan(c*x)/c^2+1/2*e*x^2*(a+b*arctan(c*x))+a*d*ln(x)+
1/2*I*b*d*polylog(2,-I*c*x)-1/2*I*b*d*polylog(2,I*c*x)
```

Rubi [A] time = 0.09, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {4980, 4848, 2391, 4852, 321, 203}

$$\frac{1}{2}ibd\text{PolyLog}(2,-icx)-\frac{1}{2}ibd\text{PolyLog}(2,icx)+\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+ad\log(x)+\frac{be\tan^{-1}(cx)}{2c^2}-\frac{bex}{2c}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] -(b*e*x)/(2*c) + (b*e*ArcTan[c*x])/(2*c^2) + (e*x^2*(a + b*ArcTan[c*x]))/2
+ a*d*Log[x] + (I/2)*b*d*PolyLog[2, (-I)*c*x] - (I/2)*b*d*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
```

```
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$
\begin{aligned}
\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x}\,dx &= \int \left(\frac{d(a+b\tan^{-1}(cx))}{x}+ex(a+b\tan^{-1}(cx))\right)dx \\
&= d\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+e\int x(a+b\tan^{-1}(cx))\,dx \\
&= \frac{1}{2}ex^2(a+b\tan^{-1}(cx))+ad\log(x)+\frac{1}{2}(ibd)\int \frac{\log(1-icx)}{x}\,dx-\frac{1}{2}(ibd)\int \\
&= -\frac{bex}{2c}+\frac{1}{2}ex^2(a+b\tan^{-1}(cx))+ad\log(x)+\frac{1}{2}ibd\mathrm{Li}_2(-icx)-\frac{1}{2}ibd\mathrm{Li}_2(icx \\
&= -\frac{bex}{2c}+\frac{be\tan^{-1}(cx)}{2c^2}+\frac{1}{2}ex^2(a+b\tan^{-1}(cx))+ad\log(x)+\frac{1}{2}ibd\mathrm{Li}_2(-icx
\end{aligned}
$$

Mathematica [A] time = 0.00, size = 83, normalized size = 1.08

$$ad\log(x)+\frac{1}{2}aex^2+\frac{be\tan^{-1}(cx)}{2c^2}+\frac{1}{2}ibd\mathrm{Li}_2(-icx)-\frac{1}{2}ibd\mathrm{Li}_2(icx)+\frac{1}{2}bex^2\tan^{-1}(cx)-\frac{bex}{2c}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] -1/2*(b*e*x)/c + (a*e*x^2)/2 + (b*e*ArcTan[c*x])/(2*c^2) + (b*e*x^2*ArcTan[
c*x])/2 + a*d*Log[x] + (I/2)*b*d*PolyLog[2, (-I)*c*x] - (I/2)*b*d*PolyLog[2
, I*c*x]
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{aex^2+ad+(bex^2+bd)\arctan(cx)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 117, normalized size = 1.52

$$\frac{ax^2e}{2}+da\ln(cx)+\frac{\arctan(cx)\,bex^2}{2}+b\arctan(cx)\,d\ln(cx)+\frac{be\arctan(cx)}{2c^2}-\frac{bex}{2c}+\frac{ibd\ln(cx)\ln(icx+1)}{2}-\frac{ibd\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))/x,x)
```

```
[Out] 1/2*a*x^2*e+d*a*ln(c*x)+1/2*arctan(c*x)*b*e*x^2+b*arctan(c*x)*d*ln(c*x)+1/2
*b*e*arctan(c*x)/c^2-1/2*b*e*x/c+1/2*I*b*d*ln(c*x)*ln(1+I*c*x)-1/2*I*b*d*ln
(c*x)*ln(1-I*c*x)+1/2*I*b*d*dilog(1+I*c*x)-1/2*I*b*d*dilog(1-I*c*x)
```

maxima [A] time = 0.62, size = 104, normalized size = 1.35

$$\frac{1}{2}\,aex^2+ad\log(x)-\frac{\pi bc^2d\log\left(c^2x^2+1\right)-4\,bc^2d\arctan(cx)\log(cx)+2i\,bc^2d\mathrm{Li}_2\,(i\,cx+1)-2i\,bc^2d\mathrm{Li}_2\,(-i\,cx+1}{4\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/2*a*e*x^2 + a*d*log(x) - 1/4*(pi*b*c^2*d*log(c^2*x^2 + 1) - 4*b*c^2*d*arc
tan(c*x)*log(c*x) + 2*I*b*c^2*d*dilog(I*c*x + 1) - 2*I*b*c^2*d*dilog(-I*c*x
 + 1) + 2*b*c*e*x - 2*(b*c^2*e*x^2 + b*e)*arctan(c*x))/c^2
```

mupad [B] time = 0.68, size = 88, normalized size = 1.14

$$\begin{cases} \frac{a\left(e\,x^2+2\,d\,\ln(x)\right)}{2} & \text{if } c=0\\ \frac{a\left(e\,x^2+2\,d\,\ln(x)\right)}{2}-b\,e\left(\frac{x}{2\,c}-\mathrm{atan}\,(c\,x)\left(\frac{1}{2\,c^2}+\frac{x^2}{2}\right)\right)-\frac{b\,d\,(\mathrm{Li}_2(1-c\,x\,1\mathrm{i})-\mathrm{Li}_2(1+c\,x\,1\mathrm{i}))\,1\mathrm{i}}{2} & \text{if } c\neq 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2))/x,x)
```

```
[Out] piecewise(c == 0, (a*(e*x^2 + 2*d*log(x)))/2, c ~= 0, (a*(e*x^2 + 2*d*log(x
)))/2 - b*e*(x/(2*c) - atan(c*x)*(1/(2*c^2) + x^2/2)) - (b*d*(dilog(- c*x*1
i + 1) - dilog(c*x*1i + 1))*1i)/2)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(a+b\,\mathrm{atan}\,(cx))\left(d+ex^2\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))/x,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)/x, x)
```

3.1119 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^2}\,dx$

Optimal. Leaf size=57

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{x}+ex\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(c^2d+e\right)\log\left(c^2x^2+1\right)}{2c}+bcd\log(x)$$

```
[Out] -d*(a+b*arctan(c*x))/x+e*x*(a+b*arctan(c*x))+b*c*d*ln(x)-1/2*b*(c^2*d+e)*ln
(c^2*x^2+1)/c
```

Rubi [A] time = 0.08, antiderivative size = 57, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {14, 4976, 446, 72}

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{x}+ex\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(c^2d+e\right)\log\left(c^2x^2+1\right)}{2c}+bcd\log(x)$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -((d*(a + b*ArcTan[c*x]))/x) + e*x*(a + b*ArcTan[c*x]) + b*c*d*Log[x] - (b*
(c^2*d + e)*Log[1 + c^2*x^2])/(2*c)
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^2}\,dx = -\frac{d(a+b\tan^{-1}(cx))}{x} + ex(a+b\tan^{-1}(cx)) - (bc)\int \frac{-d+ex^2}{x(1+c^2x^2)}\,dx$$
$$= -\frac{d(a+b\tan^{-1}(cx))}{x} + ex(a+b\tan^{-1}(cx)) - \frac{1}{2}(bc)\,\mathrm{Subst}\left(\int \frac{-d+ex}{x(1+c^2x)}\,dx,\right.$$
$$= -\frac{d(a+b\tan^{-1}(cx))}{x} + ex(a+b\tan^{-1}(cx)) - \frac{1}{2}(bc)\,\mathrm{Subst}\left(\int \left(-\frac{d}{x} + \frac{c^2d+e}{1+c^2x}\right.\right.$$
$$= -\frac{d(a+b\tan^{-1}(cx))}{x} + ex(a+b\tan^{-1}(cx)) + bcd\log(x) - \frac{b(c^2d+e)\log(1}{2c}$$

Mathematica [A] time = 0.00, size = 73, normalized size = 1.28

$$-\frac{ad}{x}+aex-\frac{1}{2}bcd\log\left(c^2x^2+1\right)-\frac{be\log\left(c^2x^2+1\right)}{2c}+bcd\log(x)-\frac{bd\tan^{-1}(cx)}{x}+bex\tan^{-1}(cx)$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -((a*d)/x) + a*e*x - (b*d*ArcTan[c*x])/x + b*e*x*ArcTan[c*x] + b*c*d*Log[x]
 - (b*c*d*Log[1 + c^2*x^2])/2 - (b*e*Log[1 + c^2*x^2])/(2*c)
```

fricas [A] time = 0.49, size = 74, normalized size = 1.30

$$\frac{2\,bc^2dx\log(x)+2\,acex^2-2\,acd-\left(bc^2d+be\right)x\log\left(c^2x^2+1\right)+2\left(bcex^2-bcd\right)\arctan\left(cx\right)}{2\,cx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/2*(2*b*c^2*d*x*log(x) + 2*a*c*e*x^2 - 2*a*c*d - (b*c^2*d + b*e)*x*log(c^2
*x^2 + 1) + 2*(b*c*e*x^2 - b*c*d)*arctan(c*x))/(c*x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 72, normalized size = 1.26

$$aex-\frac{ad}{x}+bex\arctan\left(cx\right)-\frac{b\arctan\left(cx\right)d}{x}+cbd\ln\left(cx\right)-\frac{bcd\ln\left(c^2x^2+1\right)}{2}-\frac{be\ln\left(c^2x^2+1\right)}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] a*e*x-a*d/x+b*e*x*arctan(c*x)-b*arctan(c*x)*d/x+c*b*d*ln(c*x)-1/2*b*c*d*ln(
c^2*x^2+1)-1/2*b*e*ln(c^2*x^2+1)/c
```

maxima [A] time = 0.32, size = 73, normalized size = 1.28

$$-\frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan\left(cx\right)}{x}\right)bd+aex+\frac{\left(2\,cx\arctan\left(cx\right)-\log\left(c^2x^2+1\right)\right)be}{2\,c}-\frac{ad}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] -1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d + a*e*x + 1/2*
(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*e/c - a*d/x
```

mupad [B] time = 0.23, size = 69, normalized size = 1.21

$$a\,e\,x-\frac{a\,d}{x}+b\,e\,x\,\mathrm{atan}\left(c\,x\right)-\frac{b\,c\,d\,\ln\left(c^2\,x^2+1\right)}{2}+b\,c\,d\,\ln(x)-\frac{b\,d\,\mathrm{atan}\left(c\,x\right)}{x}-\frac{b\,e\,\ln\left(c^2\,x^2+1\right)}{2\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2))/x^2,x)
```

```
[Out] a*e*x - (a*d)/x + b*e*x*atan(c*x) - (b*c*d*log(c^2*x^2 + 1))/2 + b*c*d*log(
x) - (b*d*atan(c*x))/x - (b*e*log(c^2*x^2 + 1))/(2*c)
```

sympy [A] time = 0.95, size = 80, normalized size = 1.40

$$\begin{cases} -\frac{ad}{x} + aex + bcd\log{\left(x \right)} - \frac{bcd\log{\left(x^{2} + \frac{1}{c^{2}} \right)}}{2} - \frac{bd\,\mathrm{atan}{\left(cx \right)}}{x} + bex\,\mathrm{atan}{\left(cx \right)} - \frac{be\log{\left(x^{2} + \frac{1}{c^{2}} \right)}}{2c} & \text{for}\: c \neq 0 \\ a\left(-\frac{d}{x} + ex\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))/x**2,x)
```

```
[Out] Piecewise((-a*d/x + a*e*x + b*c*d*log(x) - b*c*d*log(x**2 + c**(-2))/2 - b*
d*atan(c*x)/x + b*e*x*atan(c*x) - b*e*log(x**2 + c**(-2))/(2*c), Ne(c, 0)),
 (a*(-d/x + e*x), True))
```

3.1120 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=77

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{2x^2}+ae\log(x)-\frac{1}{2}bc^2d\tan^{-1}(cx)-\frac{bcd}{2x}+\frac{1}{2}ibe\text{Li}_2(-icx)-\frac{1}{2}ibe\text{Li}_2(icx)$$

```
[Out] -1/2*b*c*d/x-1/2*b*c^2*d*arctan(c*x)-1/2*d*(a+b*arctan(c*x))/x^2+a*e*ln(x)+
1/2*I*b*e*polylog(2,-I*c*x)-1/2*I*b*e*polylog(2,I*c*x)
```

Rubi [A] time = 0.10, antiderivative size = 77, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {4980, 4852, 325, 203, 4848, 2391}

$$\frac{1}{2}ibe\text{PolyLog}(2,-icx)-\frac{1}{2}ibe\text{PolyLog}(2,icx)-\frac{d\left(a+b\tan^{-1}(cx)\right)}{2x^2}+ae\log(x)-\frac{1}{2}bc^2d\tan^{-1}(cx)-\frac{bcd}{2x}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -(b*c*d)/(2*x) - (b*c^2*d*ArcTan[c*x])/2 - (d*(a + b*ArcTan[c*x]))/(2*x^2)
+ a*e*Log[x] + (I/2)*b*e*PolyLog[2, (-I)*c*x] - (I/2)*b*e*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx=\int\left(\frac{d\left(a+b\tan^{-1}(cx)\right)}{x^3}+\frac{e\left(a+b\tan^{-1}(cx)\right)}{x}\right)dx$$
$$=d\int\frac{a+b\tan^{-1}(cx)}{x^3}\,dx+e\int\frac{a+b\tan^{-1}(cx)}{x}\,dx$$
$$=-\frac{d\left(a+b\tan^{-1}(cx)\right)}{2x^2}+ae\log(x)+\frac{1}{2}(bcd)\int\frac{1}{x^2\left(1+c^2x^2\right)}\,dx+\frac{1}{2}(ibe)\int$$
$$=-\frac{bcd}{2x}-\frac{d\left(a+b\tan^{-1}(cx)\right)}{2x^2}+ae\log(x)+\frac{1}{2}ibe\text{Li}_2(-icx)-\frac{1}{2}ibe\text{Li}_2(icx)-$$
$$=-\frac{bcd}{2x}-\frac{1}{2}bc^2d\tan^{-1}(cx)-\frac{d\left(a+b\tan^{-1}(cx)\right)}{2x^2}+ae\log(x)+\frac{1}{2}ibe\text{Li}_2(-icx$$

Mathematica [C] time = 0.01, size = 86, normalized size = 1.12

$$-\frac{ad}{2x^2}+ae\log(x)-\frac{bcd\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)}{2x}-\frac{bd\tan^{-1}(cx)}{2x^2}+\frac{1}{2}ibe\text{Li}_2(-icx)-\frac{1}{2}ibe\text{Li}_2(icx)$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^3,x]
[Out] -1/2*(a*d)/x^2 - (b*d*ArcTan[c*x])/(2*x^2) - (b*c*d*Hypergeometric2F1[-1/2,
 1, 1/2, -(c^2*x^2)])/(2*x) + a*e*Log[x] + (I/2)*b*e*PolyLog[2, (-I)*c*x] -
 (I/2)*b*e*PolyLog[2, I*c*x]
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{aex^2+ad+\left(bex^2+bd\right)\arctan(cx)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 0.07, size = 117, normalized size = 1.52

$$ae\ln(cx)-\frac{da}{2x^2}+b\arctan(cx)\,e\ln(cx)-\frac{b\arctan(cx)\,d}{2x^2}+\frac{ibe\ln(cx)\ln(icx+1)}{2}-\frac{ibe\ln(cx)\ln(-icx+1)}{2}+\frac{ibe\,\text{dil}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] a*e*ln(c*x)-1/2*d*a/x^2+b*arctan(c*x)*e*ln(c*x)-1/2*b*arctan(c*x)*d/x^2+1/2
*I*b*e*ln(c*x)*ln(1+I*c*x)-1/2*I*b*e*ln(c*x)*ln(1-I*c*x)+1/2*I*b*e*dilog(1+
I*c*x)-1/2*I*b*e*dilog(1-I*c*x)-1/2*b*c*d/x-1/2*b*c^2*d*arctan(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(\left(c\arctan\left(cx\right)+\frac{1}{x}\right)c+\frac{\arctan\left(cx\right)}{x^2}\right)bd+be\int\frac{\arctan\left(cx\right)}{x}\,dx+ae\log(x)-\frac{ad}{2\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d + b*e*integrate(arctan
(c*x)/x, x) + a*e*log(x) - 1/2*a*d/x^2
```

mupad [B] time = 0.72, size = 91, normalized size = 1.18

$$\begin{cases} a\,e\,\ln(x)-\frac{a\,d}{2\,x^2} & \text{if } c=0\\ a\,e\,\ln(x)-\frac{a\,d}{2\,x^2}-\frac{b\,d\,\mathrm{atan}(c\,x)}{2\,x^2}-\frac{b\,d\left(c^3\,\mathrm{atan}(c\,x)+\frac{c^2}{x}\right)}{2\,c}-\frac{b\,e\,(\mathrm{Li}_2(1-c\,x\,1\mathrm{i})-\mathrm{Li}_2(1+c\,x\,1\mathrm{i}))\,1\mathrm{i}}{2} & \text{if } c\neq 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2))/x^3,x)
```

```
[Out] piecewise(c == 0, a*e*log(x) - (a*d)/(2*x^2), c ~= 0, a*e*log(x) - (b*e*(di
log(- c*x*1i + 1) - dilog(c*x*1i + 1))*1i)/2 - (a*d)/(2*x^2) - (b*d*atan(c*
x))/(2*x^2) - (b*d*(c^3*atan(c*x) + c^2/x))/(2*c))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\,\mathrm{atan}\left(cx\right)\right)\left(d+ex^2\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))/x**3,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)/x**3, x)
```

3.1121 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^4}\,dx$

Optimal. Leaf size=83

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{1}{6}bc\left(c^2d-3e\right)\log\left(c^2x^2+1\right)-\frac{1}{3}bc\log(x)\left(c^2d-3e\right)-\frac{bcd}{6x^2}$$

```
[Out] -1/6*b*c*d/x^2-1/3*d*(a+b*arctan(c*x))/x^3-e*(a+b*arctan(c*x))/x-1/3*b*c*(c
^2*d-3*e)*ln(x)+1/6*b*c*(c^2*d-3*e)*ln(c^2*x^2+1)
```

Rubi [A] time = 0.12, antiderivative size = 83, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4976, 12, 446, 77}

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{1}{6}bc\left(c^2d-3e\right)\log\left(c^2x^2+1\right)-\frac{1}{3}bc\log(x)\left(c^2d-3e\right)-\frac{bcd}{6x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*d)/(6*x^2) - (d*(a + b*ArcTan[c*x]))/(3*x^3) - (e*(a + b*ArcTan[c*x])
)/x - (b*c*(c^2*d - 3*e)*Log[x])/3 + (b*c*(c^2*d - 3*e)*Log[1 + c^2*x^2])/6
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
```

```
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^4}\,dx = -\frac{d(a+b\tan^{-1}(cx))}{3x^3} - \frac{e(a+b\tan^{-1}(cx))}{x} - (bc)\int \frac{-d-3ex^2}{3x^3(1+c^2x^2)}\,dx$$
$$= -\frac{d(a+b\tan^{-1}(cx))}{3x^3} - \frac{e(a+b\tan^{-1}(cx))}{x} - \frac{1}{3}(bc)\int \frac{-d-3ex^2}{x^3(1+c^2x^2)}\,dx$$
$$= -\frac{d(a+b\tan^{-1}(cx))}{3x^3} - \frac{e(a+b\tan^{-1}(cx))}{x} - \frac{1}{6}(bc)\,\text{Subst}\left(\int \frac{-d-3ex}{x^2(1+c^2x)}\,dx\right.$$
$$= -\frac{d(a+b\tan^{-1}(cx))}{3x^3} - \frac{e(a+b\tan^{-1}(cx))}{x} - \frac{1}{6}(bc)\,\text{Subst}\left(\int\left(-\frac{d}{x^2} + \frac{c^2d-3}{x}\right.\right.$$
$$= -\frac{bcd}{6x^2} - \frac{d(a+b\tan^{-1}(cx))}{3x^3} - \frac{e(a+b\tan^{-1}(cx))}{x} - \frac{1}{3}bc(c^2d-3e)\log(x) + \frac{1}{6}$$

Mathematica [A] time = 0.04, size = 98, normalized size = 1.18

$$-\frac{ad}{3x^3}-\frac{ae}{x}+\frac{1}{6}bcd\left(c^2\log(c^2x^2+1)-2c^2\log(x)-\frac{1}{x^2}\right)-\frac{1}{2}bce\log(c^2x^2+1)-\frac{bd\tan^{-1}(cx)}{3x^3}+bce\log(x)-\frac{be\tan^{-1}(c}{x}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -1/3*(a*d)/x^3 - (a*e)/x - (b*d*ArcTan[c*x])/(3*x^3) - (b*e*ArcTan[c*x])/x
+ b*c*e*Log[x] - (b*c*e*Log[1 + c^2*x^2])/2 + (b*c*d*(-x^(-2) - 2*c^2*Log[x
] + c^2*Log[1 + c^2*x^2]))/6
```

fricas [A] time = 0.43, size = 85, normalized size = 1.02

$$\frac{(bc^3d-3\,bce)x^3\log(c^2x^2+1)-2\,(bc^3d-3\,bce)x^3\log(x)-bcdx-6\,aex^2-2\,ad-2\,(3\,bex^2+bd)\arctan(cx)}{6\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/6*((b*c^3*d - 3*b*c*e)*x^3*log(c^2*x^2 + 1) - 2*(b*c^3*d - 3*b*c*e)*x^3*l
og(x) - b*c*d*x - 6*a*e*x^2 - 2*a*d - 2*(3*b*e*x^2 + b*d)*arctan(c*x))/x^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 97, normalized size = 1.17

$$-\frac{ad}{3x^3}-\frac{ae}{x}-\frac{b\arctan(cx)\,d}{3x^3}-\frac{b\arctan(cx)\,e}{x}-\frac{c^3bd\ln(cx)}{3}+cb\ln(cx)\,e-\frac{bcd}{6x^2}+\frac{c^3b\ln(c^2x^2+1)\,d}{6}-\frac{cb\ln(c^2x^2+1)\,e}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] -1/3*a*d/x^3-a*e/x-1/3*b*arctan(c*x)*d/x^3-b*arctan(c*x)*e/x-1/3*c^3*b*d*ln
(c*x)+c*b*ln(c*x)*e-1/6*b*c*d/x^2+1/6*c^3*b*ln(c^2*x^2+1)*d-1/2*c*b*ln(c^2*
x^2+1)*e
```

maxima [A] time = 0.32, size = 93, normalized size = 1.12

$$\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan\left(cx\right)}{x^3}\right)bd-\frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan\left(cx\right)}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b
*d - 1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*e - a*e/x -
1/3*a*d/x^3
```

mupad [B] time = 0.55, size = 92, normalized size = 1.11

$$b\,c\,e\,\ln(x)-\frac{a\,e}{x}-\frac{b\,c\,e\,\ln\left(c^2\,x^2+1\right)}{2}-\frac{b\,c\,d}{6\,x^2}-\frac{a\,d}{3\,x^3}-\frac{b\,d\,\mathrm{atan}\left(c\,x\right)}{3\,x^3}-\frac{b\,e\,\mathrm{atan}\left(c\,x\right)}{x}+\frac{b\,c^3\,d\,\ln\left(c^2\,x^2+1\right)}{6}-\frac{b\,c^3\,d\,\ln(x)}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2))/x^4,x)
```

```
[Out] b*c*e*log(x) - (a*e)/x - (b*c*e*log(c^2*x^2 + 1))/2 - (b*c*d)/(6*x^2) - (a*
d)/(3*x^3) - (b*d*atan(c*x))/(3*x^3) - (b*e*atan(c*x))/x + (b*c^3*d*log(c^2
*x^2 + 1))/6 - (b*c^3*d*log(x))/3
```

sympy [A] time = 1.29, size = 116, normalized size = 1.40

$$\begin{cases} -\frac{ad}{3x^3}-\frac{ae}{x}-\frac{bc^3d\log\left(x\right)}{3}+\frac{bc^3d\log\left(x^2+\frac{1}{c^2}\right)}{6}-\frac{bcd}{6x^2}+bce\log\left(x\right)-\frac{bce\log\left(x^2+\frac{1}{c^2}\right)}{2}-\frac{bd\,\mathrm{atan}\left(cx\right)}{3x^3}-\frac{be\,\mathrm{atan}\left(cx\right)}{x} & \text{for}\: c \neq 0 \\ a\left(-\frac{d}{3x^3}-\frac{e}{x}\right) & \text{otherwise} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Piecewise((-a*d/(3*x**3) - a*e/x - b*c**3*d*log(x)/3 + b*c**3*d*log(x**2 +
c**(-2))/6 - b*c*d/(6*x**2) + b*c*e*log(x) - b*c*e*log(x**2 + c**(-2))/2 -
b*d*atan(c*x)/(3*x**3) - b*e*atan(c*x)/x, Ne(c, 0)), (a*(-d/(3*x**3) - e/x)
, True))
```

3.1122 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^5}\,dx$

Optimal. Leaf size=82

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{bc\left(c^2d-2e\right)}{4x}+\frac{1}{4}bc^2\left(c^2d-2e\right)\tan^{-1}(cx)-\frac{bcd}{12x^3}$$

```
[Out] -1/12*b*c*d/x^3+1/4*b*c*(c^2*d-2*e)/x+1/4*b*c^2*(c^2*d-2*e)*arctan(c*x)-1/4
*d*(a+b*arctan(c*x))/x^4-1/2*e*(a+b*arctan(c*x))/x^2
```

Rubi [A] time = 0.09, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {14, 4976, 12, 453, 325, 203}

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{bc\left(c^2d-2e\right)}{4x}+\frac{1}{4}bc^2\left(c^2d-2e\right)\tan^{-1}(cx)-\frac{bcd}{12x^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(b*c*d)/(12*x^3) + (b*c*(c^2*d - 2*e))/(4*x) + (b*c^2*(c^2*d - 2*e)*ArcTan
[c*x])/4 - (d*(a + b*ArcTan[c*x]))/(4*x^4) - (e*(a + b*ArcTan[c*x]))/(2*x^2
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 453

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*e^n*(m + 1)), Int[(e*
x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[b*c
 - a*d, 0] && (IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (
LtQ[n, 0] && GtQ[m + n, -1])) &&  !ILtQ[p, -1]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx = -\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2x^2}-(bc)\int \frac{-d-2ex^2}{4x^4\left(1+c^2x^2\right)}\,dx$$
$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{1}{4}(bc)\int \frac{-d-2ex^2}{x^4\left(1+c^2x^2\right)}\,dx$$
$$= -\frac{bcd}{12x^3}-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{1}{4}\left(bc\left(c^2d-2e\right)\right)\int$$
$$= -\frac{bcd}{12x^3}+\frac{bc\left(c^2d-2e\right)}{4x}-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{1}{4}\left(bc\right.$$
$$= -\frac{bcd}{12x^3}+\frac{bc\left(c^2d-2e\right)}{4x}+\frac{1}{4}bc^2\left(c^2d-2e\right)\tan^{-1}(cx)-\frac{d\left(a+b\tan^{-1}(cx)\right)}{4x^4}$$

Mathematica [C] time = 0.01, size = 97, normalized size = 1.18

$$-\frac{ad}{4x^4}-\frac{ae}{2x^2}-\frac{bcd\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right)}{12x^3}-\frac{bce\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)}{2x}-\frac{bd\tan^{-1}(cx)}{4x^4}-\frac{be\tan^{-1}(cx)}{2x^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -1/4*(a*d)/x^4 - (a*e)/(2*x^2) - (b*d*ArcTan[c*x])/(4*x^4) - (b*e*ArcTan[c*
x])/(2*x^2) - (b*c*d*Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)])/(12*x^3)
 - (b*c*e*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/(2*x)
```

fricas [A] time = 0.48, size = 75, normalized size = 0.91

$$-\frac{bcdx+6\,aex^2-3\left(bc^3d-2\,bce\right)x^3+3\,ad-3\left(\left(bc^4d-2\,bc^2e\right)x^4-2\,bex^2-bd\right)\arctan\left(cx\right)}{12\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] -1/12*(b*c*d*x + 6*a*e*x^2 - 3*(b*c^3*d - 2*b*c*e)*x^3 + 3*a*d - 3*((b*c^4*
d - 2*b*c^2*e)*x^4 - 2*b*e*x^2 - b*d)*arctan(c*x))/x^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 86, normalized size = 1.05

$$-\frac{ad}{4x^4}-\frac{ae}{2x^2}-\frac{b\arctan(cx)\,d}{4x^4}-\frac{b\arctan(cx)\,e}{2x^2}+\frac{b\,c^3d}{4x}-\frac{cbe}{2x}-\frac{bcd}{12x^3}+\frac{c^4b\arctan(cx)\,d}{4}-\frac{b\,c^2e\arctan(cx)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] -1/4*a*d/x^4-1/2*a*e/x^2-1/4*b*arctan(c*x)*d/x^4-1/2*b*arctan(c*x)*e/x^2+1/
4*b*c^3*d/x-1/2*c*b*e/x-1/12*b*c*d/x^3+1/4*c^4*b*arctan(c*x)*d-1/2*b*c^2*e*
arctan(c*x)
```

maxima [A] time = 0.41, size = 80, normalized size = 0.98

$$\frac{1}{12}\left(\left(3\,c^3\arctan(cx)+\frac{3\,c^2x^2-1}{x^3}\right)c-\frac{3\,\arctan(cx)}{x^4}\right)bd-\frac{1}{2}\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)be-\frac{ae}{2\,x^2}-\frac{ad}{4\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] 1/12*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*d
- 1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*e - 1/2*a*e/x^2 - 1/4*a
*d/x^4
```

mupad [B] time = 0.59, size = 162, normalized size = 1.98

$$-\frac{\frac{a\,d}{4}+\frac{a\,x^2\left(d\,c^2+2\,e\right)}{4}+\frac{b\,d\,\mathrm{atan}(c\,x)}{4}+\frac{b\,c\,d\,x}{12}+\frac{b\,c^3\,x^5\left(2\,e-c^2\,d\right)}{4}+\frac{b\,c\,x^3\left(3\,e-c^2\,d\right)}{6}-\frac{a\,c^4\,e\,x^6}{2}+\frac{b\,x^2\,\mathrm{atan}(c\,x)\left(d\,c^2+2\,e\right)}{4}+\frac{b\,c^2\,e\,x^4\,\mathrm{atan}(c\,x)}{2}}{c^2\,x^6+x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2))/x^5,x)
```

```
[Out] - ((a*d)/4 + (a*x^2*(2*e + c^2*d))/4 + (b*d*atan(c*x))/4 + (b*c*d*x)/12 + (
b*c^3*x^5*(2*e - c^2*d))/4 + (b*c*x^3*(3*e - c^2*d))/6 - (a*c^4*e*x^6)/2 +
(b*x^2*atan(c*x)*(2*e + c^2*d))/4 + (b*c^2*e*x^4*atan(c*x))/2)/(x^4 + c^2*x
^6) - (atan((c^2*x)/(c^2)^(1/2))*(2*b*e - b*c^2*d)*(c^2)^(3/2))/(4*c)
```

sympy [A] time = 1.02, size = 99, normalized size = 1.21

$$-\frac{ad}{4x^4}-\frac{ae}{2x^2}+\frac{bc^4d\,\mathrm{atan}(cx)}{4}+\frac{bc^3d}{4x}-\frac{bc^2e\,\mathrm{atan}(cx)}{2}-\frac{bcd}{12x^3}-\frac{bce}{2x}-\frac{bd\,\mathrm{atan}(cx)}{4x^4}-\frac{be\,\mathrm{atan}(cx)}{2x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))/x**5,x)
```

```
[Out] -a*d/(4*x**4) - a*e/(2*x**2) + b*c**4*d*atan(c*x)/4 + b*c**3*d/(4*x) - b*c*
*2*e*atan(c*x)/2 - b*c*d/(12*x**3) - b*c*e/(2*x) - b*d*atan(c*x)/(4*x**4) -
 b*e*atan(c*x)/(2*x**2)
```

3.1123 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^6}\,dx$

Optimal. Leaf size=110

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{bc\left(3c^2d-5e\right)}{30x^2}-\frac{1}{30}bc^3\left(3c^2d-5e\right)\log\left(c^2x^2+1\right)+\frac{1}{15}bc^3\log(x)\left(3c^2\right.$$

```
[Out] -1/20*b*c*d/x^4+1/30*b*c*(3*c^2*d-5*e)/x^2-1/5*d*(a+b*arctan(c*x))/x^5-1/3*
e*(a+b*arctan(c*x))/x^3+1/15*b*c^3*(3*c^2*d-5*e)*ln(x)-1/30*b*c^3*(3*c^2*d-
5*e)*ln(c^2*x^2+1)
```

Rubi [A] time = 0.13, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {14, 4976, 12, 446, 77}

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{bc\left(3c^2d-5e\right)}{30x^2}-\frac{1}{30}bc^3\left(3c^2d-5e\right)\log\left(c^2x^2+1\right)+\frac{1}{15}bc^3\log(x)\left(3c^2\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -(b*c*d)/(20*x^4) + (b*c*(3*c^2*d - 5*e))/(30*x^2) - (d*(a + b*ArcTan[c*x])
)/(5*x^5) - (e*(a + b*ArcTan[c*x]))/(3*x^3) + (b*c^3*(3*c^2*d - 5*e)*Log[x]
)/15 - (b*c^3*(3*c^2*d - 5*e)*Log[1 + c^2*x^2])/30
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
```

```
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx = -\frac{d\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{3x^3}-(bc)\int \frac{-3d-5ex^2}{15x^5\left(1+c^2x^2\right)}\,dx$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{1}{15}(bc)\int \frac{-3d-5ex^2}{x^5\left(1+c^2x^2\right)}\,dx$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{1}{30}(bc)\,\text{Subst}\left(\int \frac{-3d-5ex}{x^3\left(1+c^2x\right)}\,d\right.$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{1}{30}(bc)\,\text{Subst}\left(\int \left(-\frac{3d}{x^3}+\frac{3c^2d}{x^2}\right.\right.$$

$$= -\frac{bcd}{20x^4}+\frac{bc\left(3c^2d-5e\right)}{30x^2}-\frac{d\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{1}{15}bc^3$$

Mathematica [A] time = 0.05, size = 123, normalized size = 1.12

$$-\frac{ad}{5x^5}-\frac{ae}{3x^3}+\frac{1}{6}bce\left(c^2\log\left(c^2x^2+1\right)-2c^2\log(x)-\frac{1}{x^2}\right)+\frac{1}{10}bcd\left(2c^4\log(x)+\frac{c^2}{x^2}-c^4\log\left(c^2x^2+1\right)-\frac{1}{2x^4}\right)-\frac{bd\,\text{ta}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -1/5*(a*d)/x^5 - (a*e)/(3*x^3) - (b*d*ArcTan[c*x])/(5*x^5) - (b*e*ArcTan[c*
x])/(3*x^3) + (b*c*e*(-x^(-2) - 2*c^2*Log[x] + c^2*Log[1 + c^2*x^2]))/6 + (
b*c*d*(-1/2*1/x^4 + c^2/x^2 + 2*c^4*Log[x] - c^4*Log[1 + c^2*x^2]))/10
```

fricas [A] time = 0.45, size = 111, normalized size = 1.01

$$-\frac{2\left(3\,bc^5d-5\,bc^3e\right)x^5\log\left(c^2x^2+1\right)-4\left(3\,bc^5d-5\,bc^3e\right)x^5\log(x)+3\,bcdx+20\,aex^2-2\left(3\,bc^3d-5\,bce\right)x^3+12}{60\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] -1/60*(2*(3*b*c^5*d - 5*b*c^3*e)*x^5*log(c^2*x^2 + 1) - 4*(3*b*c^5*d - 5*b*
c^3*e)*x^5*log(x) + 3*b*c*d*x + 20*a*e*x^2 - 2*(3*b*c^3*d - 5*b*c*e)*x^3 +
12*a*d + 4*(5*b*e*x^2 + 3*b*d)*arctan(c*x))/x^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.07, size = 120, normalized size = 1.09

$$-\frac{ae}{3x^3}-\frac{ad}{5x^5}-\frac{b\arctan(cx)\,e}{3x^3}-\frac{b\arctan(cx)\,d}{5x^5}+\frac{c^5bd\ln(cx)}{5}-\frac{c^3b\ln(cx)\,e}{3}+\frac{c^3bd}{10x^2}-\frac{cbe}{6x^2}-\frac{bcd}{20x^4}-\frac{c^5b\ln\left(c^2x^2+1\right)d}{10}+\frac{b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))/x^6,x)
```

```
[Out] -1/3*a*e/x^3-1/5*a*d/x^5-1/3*b*arctan(c*x)*e/x^3-1/5*b*arctan(c*x)*d/x^5+1/
5*c^5*b*d*ln(c*x)-1/3*c^3*b*ln(c*x)*e+1/10*c^3*b*d/x^2-1/6*c*b*e/x^2-1/20*b
*c*d/x^4-1/10*c^5*b*ln(c^2*x^2+1)*d+1/6*b*c^3*e*ln(c^2*x^2+1)
```

maxima [A] time = 0.31, size = 116, normalized size = 1.05

$$-\frac{1}{20}\left(\left(2\,c^4\log\left(c^2x^2+1\right)-2\,c^4\log\left(x^2\right)-\frac{2\,c^2x^2-1}{x^4}\right)c+\frac{4\,\arctan\left(cx\right)}{x^5}\right)bd+\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*c +
4*arctan(c*x)/x^5)*b*d + 1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)
*c - 2*arctan(c*x)/x^3)*b*e - 1/3*a*e/x^3 - 1/5*a*d/x^5
```

mupad [B] time = 0.24, size = 111, normalized size = 1.01

$$\frac{b\,c^3\,e\,\ln\left(c^2\,x^2+1\right)}{6}-\frac{b\,c^5\,d\,\ln\left(c^2\,x^2+1\right)}{10}-\frac{x^3\,\left(\frac{b\,c\,e}{6}-\frac{b\,c^3\,d}{10}\right)+\frac{a\,d}{5}+x^2\,\left(\frac{a\,e}{3}+\frac{b\,e\,\mathrm{atan}(c\,x)}{3}\right)+\frac{b\,d\,\mathrm{atan}(c\,x)}{5}+\frac{b\,c\,d\,x}{20}}{x^5}+\frac{b\,\cdots}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2))/x^6,x)
```

```
[Out] (b*c^3*e*log(c^2*x^2 + 1))/6 - (b*c^5*d*log(c^2*x^2 + 1))/10 - (x^3*((b*c*e
)/6 - (b*c^3*d)/10) + (a*d)/5 + x^2*((a*e)/3 + (b*e*atan(c*x))/3) + (b*d*at
an(c*x))/5 + (b*c*d*x)/20)/x^5 + (b*c^5*d*log(x))/5 - (b*c^3*e*log(x))/3
```

sympy [A] time = 2.15, size = 153, normalized size = 1.39

$$\begin{cases} -\frac{ad}{5x^5}-\frac{ae}{3x^3}+\frac{bc^5d\log\left(x\right)}{5}-\frac{bc^5d\log\left(x^2+\frac{1}{c^2}\right)}{10}+\frac{bc^3d}{10x^2}-\frac{bc^3e\log\left(x\right)}{3}+\frac{bc^3e\log\left(x^2+\frac{1}{c^2}\right)}{6}-\frac{bcd}{20x^4}-\frac{bce}{6x^2}-\frac{bd\operatorname{atan}\left(cx\right)}{5x^5}-\frac{be\operatorname{atan}\left(cx\right)}{3x^3} \\ a\left(-\frac{d}{5x^5}-\frac{e}{3x^3}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))/x**6,x)
```

```
[Out] Piecewise((-a*d/(5*x**5) - a*e/(3*x**3) + b*c**5*d*log(x)/5 - b*c**5*d*log(
x**2 + c**(-2))/10 + b*c**3*d/(10*x**2) - b*c**3*e*log(x)/3 + b*c**3*e*log(
x**2 + c**(-2))/6 - b*c*d/(20*x**4) - b*c*e/(6*x**2) - b*d*atan(c*x)/(5*x**
5) - b*e*atan(c*x)/(3*x**3), Ne(c, 0)), (a*(-d/(5*x**5) - e/(3*x**3)), True
))
```

3.1124 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^7}\,dx$

Optimal. Leaf size=105

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{6x^6}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{4x^4}+\frac{bc\left(2c^2d-3e\right)}{36x^3}-\frac{1}{12}bc^4\left(2c^2d-3e\right)\tan^{-1}(cx)-\frac{bc^3\left(2c^2d-3e\right)}{12x}-\frac{bcd}{30x^5}$$

```
[Out] -1/30*b*c*d/x^5+1/36*b*c*(2*c^2*d-3*e)/x^3-1/12*b*c^3*(2*c^2*d-3*e)/x-1/12*
b*c^4*(2*c^2*d-3*e)*arctan(c*x)-1/6*d*(a+b*arctan(c*x))/x^6-1/4*e*(a+b*arct
an(c*x))/x^4
```

Rubi [A] time = 0.11, antiderivative size = 105, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.316, Rules used = {14, 4976, 12, 453, 325, 203}

$$-\frac{d\left(a+b\tan^{-1}(cx)\right)}{6x^6}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{4x^4}+\frac{bc\left(2c^2d-3e\right)}{36x^3}-\frac{bc^3\left(2c^2d-3e\right)}{12x}-\frac{1}{12}bc^4\left(2c^2d-3e\right)\tan^{-1}(cx)-\frac{bcd}{30x^5}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -(b*c*d)/(30*x^5) + (b*c*(2*c^2*d - 3*e))/(36*x^3) - (b*c^3*(2*c^2*d - 3*e)
)/(12*x) - (b*c^4*(2*c^2*d - 3*e)*ArcTan[c*x])/12 - (d*(a + b*ArcTan[c*x]))
/(6*x^6) - (e*(a + b*ArcTan[c*x]))/(4*x^4)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 453

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*e^n*(m + 1)), Int[(e*
x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[b*c
 - a*d, 0] && (IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (
LtQ[n, 0] && GtQ[m + n, -1])) &&  !ILtQ[p, -1]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))}{x^7}\,dx = -\frac{d(a+b\tan^{-1}(cx))}{6x^6} - \frac{e(a+b\tan^{-1}(cx))}{4x^4} - (bc)\int \frac{-2d-3ex^2}{12x^6(1+c^2x^2)}\,dx$$
$$= -\frac{d(a+b\tan^{-1}(cx))}{6x^6} - \frac{e(a+b\tan^{-1}(cx))}{4x^4} - \frac{1}{12}(bc)\int \frac{-2d-3ex^2}{x^6(1+c^2x^2)}\,dx$$
$$= -\frac{bcd}{30x^5} - \frac{d(a+b\tan^{-1}(cx))}{6x^6} - \frac{e(a+b\tan^{-1}(cx))}{4x^4} - \frac{1}{12}\left(bc(2c^2d-3e)\right)\int$$
$$= -\frac{bcd}{30x^5} + \frac{bc(2c^2d-3e)}{36x^3} - \frac{d(a+b\tan^{-1}(cx))}{6x^6} - \frac{e(a+b\tan^{-1}(cx))}{4x^4} + \frac{1}{12}$$
$$= -\frac{bcd}{30x^5} + \frac{bc(2c^2d-3e)}{36x^3} - \frac{bc^3(2c^2d-3e)}{12x} - \frac{d(a+b\tan^{-1}(cx))}{6x^6} - \frac{e(a+b$$
$$= -\frac{bcd}{30x^5} + \frac{bc(2c^2d-3e)}{36x^3} - \frac{bc^3(2c^2d-3e)}{12x} - \frac{1}{12}bc^4(2c^2d-3e)\tan^{-1}(cx) -$$

Mathematica [C] time = 0.01, size = 97, normalized size = 0.92

$$-\frac{ad}{6x^6}-\frac{ae}{4x^4}-\frac{bcd\,{}_2F_1\left(-\frac{5}{2},1;-\frac{3}{2};-c^2x^2\right)}{30x^5}-\frac{bce\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right)}{12x^3}-\frac{bd\tan^{-1}(cx)}{6x^6}-\frac{be\tan^{-1}(cx)}{4x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -1/6*(a*d)/x^6 - (a*e)/(4*x^4) - (b*d*ArcTan[c*x])/(6*x^6) - (b*e*ArcTan[c*
x])/(4*x^4) - (b*c*d*Hypergeometric2F1[-5/2, 1, -3/2, -(c^2*x^2)])/(30*x^5)
 - (b*c*e*Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)])/(12*x^3)
```

fricas [A] time = 0.41, size = 98, normalized size = 0.93

$$-\frac{15\left(2\,bc^5d-3\,bc^3e\right)x^5+6\,bcdx+45\,aex^2-5\left(2\,bc^3d-3\,bce\right)x^3+30\,ad+15\left(\left(2\,bc^6d-3\,bc^4e\right)x^6+3\,bex^2+\right.}{180\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^7,x, algorithm="fricas")
```

```
[Out] -1/180*(15*(2*b*c^5*d - 3*b*c^3*e)*x^5 + 6*b*c*d*x + 45*a*e*x^2 - 5*(2*b*c^
3*d - 3*b*c*e)*x^3 + 30*a*d + 15*((2*b*c^6*d - 3*b*c^4*e)*x^6 + 3*b*e*x^2 +
 2*b*d)*arctan(c*x))/x^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^7,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 106, normalized size = 1.01

$$-\frac{ae}{4x^4}-\frac{ad}{6x^6}-\frac{b\arctan(cx)e}{4x^4}-\frac{b\arctan(cx)d}{6x^6}-\frac{c^5bd}{6x}+\frac{bc^3e}{4x}+\frac{c^3bd}{18x^3}-\frac{cbe}{12x^3}-\frac{bcd}{30x^5}-\frac{c^6b\arctan(cx)d}{6}+\frac{bc^4e\arctan(cx}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))/x^7,x)
```

```
[Out] -1/4*a*e/x^4-1/6*a*d/x^6-1/4*b*arctan(c*x)*e/x^4-1/6*b*arctan(c*x)*d/x^6-1/
6*c^5*b*d/x+1/4*b*c^3*e/x+1/18*c^3*b*d/x^3-1/12*c*b*e/x^3-1/30*b*c*d/x^5-1/
6*c^6*b*arctan(c*x)*d+1/4*b*c^4*e*arctan(c*x)
```

maxima [A] time = 0.42, size = 103, normalized size = 0.98

$$-\frac{1}{90}\left(\left(15c^5\arctan(cx)+\frac{15c^4x^4-5c^2x^2+3}{x^5}\right)c+\frac{15\arctan(cx)}{x^6}\right)bd+\frac{1}{12}\left(\left(3c^3\arctan(cx)+\frac{3c^2x^2-1}{x^3}\right)c-\frac{3}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))/x^7,x, algorithm="maxima")
```

```
[Out] -1/90*((15*c^5*arctan(c*x) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arcta
n(c*x)/x^6)*b*d + 1/12*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arc
tan(c*x)/x^4)*b*e - 1/4*a*e/x^4 - 1/6*a*d/x^6
```

mupad [B] time = 0.59, size = 130, normalized size = 1.24

$$\frac{b\,c^4\,\mathrm{atan}\left(\frac{b\,c^2\,x\,\left(3\,e-2\,c^2\,d\right)}{3\,b\,c\,e-2\,b\,c^3\,d}\right)\,\left(3\,e-2\,c^2\,d\right)}{12}-\frac{\mathrm{atan}\left(c\,x\right)\,\left(\frac{b\,e\,x^2}{4}+\frac{b\,d}{6}\right)}{x^6}-\frac{x^3\,\left(b\,c\,e-\frac{2\,b\,c^3\,d}{3}\right)+2\,a\,d-c^2\,x^5\,\left(3\,b\,c\,e-2\,b\,c^3\right.}{12\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2))/x^7,x)
```

```
[Out] (b*c^4*atan((b*c^2*x*(3*e - 2*c^2*d))/(3*b*c*e - 2*b*c^3*d))*(3*e - 2*c^2*d
))/12 - (atan(c*x)*((b*d)/6 + (b*e*x^2)/4))/x^6 - (x^3*(b*c*e - (2*b*c^3*d)
/3) + 2*a*d - c^2*x^5*(3*b*c*e - 2*b*c^3*d) + 3*a*e*x^2 + (2*b*c*d*x)/5)/(1
2*x^6)
```

sympy [A] time = 1.60, size = 122, normalized size = 1.16

$$-\frac{ad}{6x^6}-\frac{ae}{4x^4}-\frac{bc^6d\,\mathrm{atan}(cx)}{6}-\frac{bc^5d}{6x}+\frac{bc^4e\,\mathrm{atan}(cx)}{4}+\frac{bc^3d}{18x^3}+\frac{bc^3e}{4x}-\frac{bcd}{30x^5}-\frac{bce}{12x^3}-\frac{bd\,\mathrm{atan}(cx)}{6x^6}-\frac{be\,\mathrm{atan}(cx)}{4x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))/x**7,x)
```

```
[Out] -a*d/(6*x**6) - a*e/(4*x**4) - b*c**6*d*atan(c*x)/6 - b*c**5*d/(6*x) + b*c*
*4*e*atan(c*x)/4 + b*c**3*d/(18*x**3) + b*c**3*e/(4*x) - b*c*d/(30*x**5) -
b*c*e/(12*x**3) - b*d*atan(c*x)/(6*x**6) - b*e*atan(c*x)/(4*x**4)
```

3.1125 $\int x^3 \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=185

$$\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\tan^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\tan^{-1}(cx)\right)-\frac{bex^5\left(8c^2d-3e\right)}{120c^3}-\frac{b\left(6c^4d^2-8c^2de\right.}{2}$$

```
[Out] 1/24*b*(6*c^4*d^2-8*c^2*d*e+3*e^2)*x/c^7-1/72*b*(6*c^4*d^2-8*c^2*d*e+3*e^2)
*x^3/c^5-1/120*b*(8*c^2*d-3*e)*e*x^5/c^3-1/56*b*e^2*x^7/c-1/24*b*(6*c^4*d^2
-8*c^2*d*e+3*e^2)*arctan(c*x)/c^8+1/4*d^2*x^4*(a+b*arctan(c*x))+1/3*d*e*x^6
*(a+b*arctan(c*x))+1/8*e^2*x^8*(a+b*arctan(c*x))
```

Rubi [A] time = 0.19, antiderivative size = 185, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {266, 43, 4976, 1261, 203}

$$\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\tan^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\tan^{-1}(cx)\right)-\frac{bx^3\left(6c^4d^2-8c^2de+3e^2\right)}{72c^5}+\frac{bx\left(6c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (b*(6*c^4*d^2 - 8*c^2*d*e + 3*e^2)*x)/(24*c^7) - (b*(6*c^4*d^2 - 8*c^2*d*e
+ 3*e^2)*x^3)/(72*c^5) - (b*(8*c^2*d - 3*e)*e*x^5)/(120*c^3) - (b*e^2*x^7)/
(56*c) - (b*(6*c^4*d^2 - 8*c^2*d*e + 3*e^2)*ArcTan[c*x])/(24*c^8) + (d^2*x^
4*(a + b*ArcTan[c*x]))/4 + (d*e*x^6*(a + b*ArcTan[c*x]))/3 + (e^2*x^8*(a +
b*ArcTan[c*x]))/8
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
```

```
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^3\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)dx=\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\tan^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\tan^{-1}(c\right.$$
$$=\frac{1}{4}d^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}dex^6\left(a+b\tan^{-1}(cx)\right)+\frac{1}{8}e^2x^8\left(a+b\tan^{-1}(c\right.$$
$$=\frac{b\left(6c^4d^2-8c^2de+3e^2\right)x}{24c^7}-\frac{b\left(6c^4d^2-8c^2de+3e^2\right)x^3}{72c^5}-\frac{b\left(8c^2d-3e\right)ex^5}{120c^3}$$
$$=\frac{b\left(6c^4d^2-8c^2de+3e^2\right)x}{24c^7}-\frac{b\left(6c^4d^2-8c^2de+3e^2\right)x^3}{72c^5}-\frac{b\left(8c^2d-3e\right)ex^5}{120c^3}$$

Mathematica [A] time = 0.15, size = 174, normalized size = 0.94

$$\frac{105ac^8x^4\left(6d^2+8dex^2+3e^2x^4\right)+105b\tan^{-1}(cx)\left(c^8\left(6d^2x^4+8dex^6+3e^2x^8\right)-6c^4d^2+8c^2de-3e^2\right)+bcx\left(-3c^6\right.}{2520c^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (105*a*c^8*x^4*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4) + b*c*x*(315*e^2 - 105*c^2*e
*(8*d + e*x^2) + 7*c^4*(90*d^2 + 40*d*e*x^2 + 9*e^2*x^4) - 3*c^6*(70*d^2*x^
2 + 56*d*e*x^4 + 15*e^2*x^6)) + 105*b*(-6*c^4*d^2 + 8*c^2*d*e - 3*e^2 + c^8
*(6*d^2*x^4 + 8*d*e*x^6 + 3*e^2*x^8))*ArcTan[c*x])/(2520*c^8)
```

fricas [A] time = 0.42, size = 201, normalized size = 1.09

$$\frac{315\,ac^8e^2x^8+840\,ac^8dex^6-45\,bc^7e^2x^7+630\,ac^8d^2x^4-21\left(8\,bc^7de-3\,bc^5e^2\right)x^5-35\left(6\,bc^7d^2-8\,bc^5de+3\,bc^3e^2\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/2520*(315*a*c^8*e^2*x^8 + 840*a*c^8*d*e*x^6 - 45*b*c^7*e^2*x^7 + 630*a*c^
8*d^2*x^4 - 21*(8*b*c^7*d*e - 3*b*c^5*e^2)*x^5 - 35*(6*b*c^7*d^2 - 8*b*c^5*
d*e + 3*b*c^3*e^2)*x^3 + 105*(6*b*c^5*d^2 - 8*b*c^3*d*e + 3*b*c*e^2)*x + 10
5*(3*b*c^8*e^2*x^8 + 8*b*c^8*d*e*x^6 + 6*b*c^8*d^2*x^4 - 6*b*c^4*d^2 + 8*b*
c^2*d*e - 3*b*e^2)*arctan(c*x))/c^8
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 203, normalized size = 1.10

$$\frac{a\,e^2x^8}{8}+\frac{aed\,x^6}{3}+\frac{a\,x^4d^2}{4}+\frac{b\arctan\left(cx\right)e^2x^8}{8}+\frac{b\arctan\left(cx\right)ed\,x^6}{3}+\frac{b\arctan\left(cx\right)d^2x^4}{4}-\frac{b\,e^2x^7}{56c}-\frac{bed\,x^5}{15c}-\frac{b\,d^2x^3}{12c}+\frac{b\,x^5e}{40c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^2*(a+b*arctan(c*x)),x)
```

```
[Out] 1/8*a*e^2*x^8+1/3*a*e*d*x^6+1/4*a*x^4*d^2+1/8*b*arctan(c*x)*e^2*x^8+1/3*b*a
rctan(c*x)*e*d*x^6+1/4*b*arctan(c*x)*d^2*x^4-1/56*b*e^2*x^7/c-1/15/c*b*e*d*
x^5-1/12*b*d^2*x^3/c+1/40/c^3*b*x^5*e^2+1/9/c^3*b*x^3*d*e+1/4*b*d^2*x/c^3-1
/24/c^5*b*x^3*e^2-1/3/c^5*b*e*d*x+1/8/c^7*b*x*e^2-1/4*b*d^2*arctan(c*x)/c^4
+1/3/c^6*b*arctan(c*x)*e*d-1/8/c^8*b*arctan(c*x)*e^2
```

maxima [A] time = 0.41, size = 184, normalized size = 0.99

$$\frac{1}{8}ae^2x^8+\frac{1}{3}adex^6+\frac{1}{4}ad^2x^4+\frac{1}{12}\left(3x^4\arctan(cx)-c\left(\frac{c^2x^3-3x}{c^4}+\frac{3\arctan(cx)}{c^5}\right)\right)bd^2+\frac{1}{45}\left(15x^6\arctan(cx)-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*e^2*x^8 + 1/3*a*d*e*x^6 + 1/4*a*d^2*x^4 + 1/12*(3*x^4*arctan(c*x) - c
*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*d^2 + 1/45*(15*x^6*arctan(c*x
) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*d*e + 1/
840*(105*x^8*arctan(c*x) - c*((15*c^6*x^7 - 21*c^4*x^5 + 35*c^2*x^3 - 105*x
)/c^8 + 105*arctan(c*x)/c^9))*b*e^2
```

mupad [B] time = 0.54, size = 374, normalized size = 2.02

$$x^4\left(\frac{\frac{ae^2}{c^2}-\frac{ae\left(2dc^2+e\right)}{c^2}}{4c^2}+\frac{ad\left(dc^2+2e\right)}{4c^2}\right)-x^6\left(\frac{ae^2}{6c^2}-\frac{ae\left(2dc^2+e\right)}{6c^2}\right)+x^5\left(\frac{be^2}{40c^3}-\frac{bde}{15c}\right)+\mathrm{atan}(cx)\left(\frac{bd^2x^4}{4}+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^2,x)
```

```
[Out] x^4*(((a*e^2)/c^2 - (a*e*(e + 2*c^2*d))/c^2)/(4*c^2) + (a*d*(2*e + c^2*d))/
(4*c^2)) - x^6*((a*e^2)/(6*c^2) - (a*e*(e + 2*c^2*d))/(6*c^2)) + x^5*((b*e^
2)/(40*c^3) - (b*d*e)/(15*c)) + atan(c*x)*((b*d^2*x^4)/4 + (b*e^2*x^8)/8 +
(b*d*e*x^6)/3) - x^2*((((a*e^2)/c^2 - (a*e*(e + 2*c^2*d))/c^2)/c^2 + (a*d*(
2*e + c^2*d))/c^2)/(2*c^2) - (a*d^2)/(2*c^2)) - x^3*(((b*e^2)/(8*c^3) - (b*
d*e)/(3*c))/(3*c^2) + (b*d^2)/(12*c)) + (x*(((b*e^2)/(8*c^3) - (b*d*e)/(3*c
))/c^2 + (b*d^2)/(4*c)))/c^2 + (a*e^2*x^8)/8 - (b*atan((b*c*x*(3*e^2 + 6*c^
4*d^2 - 8*c^2*d*e))/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^2*d*e))*(3*e^2 + 6*c^4*d
^2 - 8*c^2*d*e))/(24*c^8) - (b*e^2*x^7)/(56*c)
```

sympy [A] time = 3.80, size = 260, normalized size = 1.41

$$\begin{cases}\frac{ad^2x^4}{4}+\frac{adex^6}{3}+\frac{ae^2x^8}{8}+\frac{bd^2x^4\operatorname{atan}(cx)}{4}+\frac{bdex^6\operatorname{atan}(cx)}{3}+\frac{be^2x^8\operatorname{atan}(cx)}{8}-\frac{bd^2x^3}{12c}-\frac{bdex^5}{15c}-\frac{be^2x^7}{56c}+\frac{bd^2x}{4c^3}+\frac{bdex^3}{9c^3}+\frac{be^2x^5}{40c^3}- \\ a\left(\frac{d^2x^4}{4}+\frac{dex^6}{3}+\frac{e^2x^8}{8}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**2*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**4/4 + a*d*e*x**6/3 + a*e**2*x**8/8 + b*d**2*x**4*atan(
c*x)/4 + b*d*e*x**6*atan(c*x)/3 + b*e**2*x**8*atan(c*x)/8 - b*d**2*x**3/(12
*c) - b*d*e*x**5/(15*c) - b*e**2*x**7/(56*c) + b*d**2*x/(4*c**3) + b*d*e*x*
*3/(9*c**3) + b*e**2*x**5/(40*c**3) - b*d**2*atan(c*x)/(4*c**4) - b*d*e*x/(
```

```
3*c**5) - b*e**2*x**3/(24*c**5) + b*d*e*atan(c*x)/(3*c**6) + b*e**2*x/(8*c*
*7) - b*e**2*atan(c*x)/(8*c**8), Ne(c, 0)), (a*(d**2*x**4/4 + d*e*x**6/3 +
e**2*x**8/8), True))
```

3.1126 $\int x^2 \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right) \, dx$

Optimal. Leaf size=161

$$\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\tan^{-1}(cx)\right)-\frac{bex^4\left(14c^2d-5e\right)}{140c^3}+\frac{b\left(35c^4d^2-42\right.}{}$$

```
[Out] -1/210*b*(35*c^4*d^2-42*c^2*d*e+15*e^2)*x^2/c^5-1/140*b*(14*c^2*d-5*e)*e*x^
4/c^3-1/42*b*e^2*x^6/c+1/3*d^2*x^3*(a+b*arctan(c*x))+2/5*d*e*x^5*(a+b*arcta
n(c*x))+1/7*e^2*x^7*(a+b*arctan(c*x))+1/210*b*(35*c^4*d^2-42*c^2*d*e+15*e^2
)*ln(c^2*x^2+1)/c^7
```

Rubi [A] time = 0.25, antiderivative size = 161, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {270, 4976, 12, 1251, 771}

$$\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\tan^{-1}(cx)\right)-\frac{bx^2\left(35c^4d^2-42c^2de+15e^2\right)}{210c^5}+\frac{b\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(35*c^4*d^2 - 42*c^2*d*e + 15*e^2)*x^2)/(210*c^5) - (b*(14*c^2*d - 5*e)
*e*x^4)/(140*c^3) - (b*e^2*x^6)/(42*c) + (d^2*x^3*(a + b*ArcTan[c*x]))/3 +
(2*d*e*x^5*(a + b*ArcTan[c*x]))/5 + (e^2*x^7*(a + b*ArcTan[c*x]))/7 + (b*(3
5*c^4*d^2 - 42*c^2*d*e + 15*e^2)*Log[1 + c^2*x^2])/(210*c^7)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 771

```
Int[((d_.) + (e_.)*(x_))^(m_.)*((f_.) + (g_.)*(x_))*((a_.) + (b_.)*(x_) + (
c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g*x)*
(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g, m}, x] && NeQ[b^
2 - 4*a*c, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0] && IntegerQ[m]))
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
```

```
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^2\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)dx=\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\tan^{-1}(c\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\tan^{-1}(c\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\tan^{-1}(c\right.$$

$$=\frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^2x^7\left(a+b\tan^{-1}(c\right.$$

$$=-\frac{b\left(35c^4d^2-42c^2de+15e^2\right)x^2}{210c^5}-\frac{b\left(14c^2d-5e\right)ex^4}{140c^3}-\frac{be^2x^6}{42c}+\frac{1}{3}d^2x^3\left(a\right.$$

Mathematica [A] time = 0.13, size = 162, normalized size = 1.01

$$\frac{c^2x^2\left(4ac^5x\left(35d^2+42dex^2+15e^2x^4\right)-2bc^4\left(35d^2+21dex^2+5e^2x^4\right)+3bc^2e\left(28d+5ex^2\right)-30be^2\right)+4bc^7x^3\,\mathrm{ta}}{420c^7}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c^2*x^2*(-30*b*e^2 + 3*b*c^2*e*(28*d + 5*e*x^2) - 2*b*c^4*(35*d^2 + 21*d*e
*x^2 + 5*e^2*x^4) + 4*a*c^5*x*(35*d^2 + 42*d*e*x^2 + 15*e^2*x^4)) + 4*b*c^7
*x^3*(35*d^2 + 42*d*e*x^2 + 15*e^2*x^4)*ArcTan[c*x] + 2*b*(35*c^4*d^2 - 42*
c^2*d*e + 15*e^2)*Log[1 + c^2*x^2])/(420*c^7)
```

fricas [A] time = 0.42, size = 186, normalized size = 1.16

$$\frac{60\,ac^7e^2x^7+168\,ac^7dex^5-10\,bc^6e^2x^6+140\,ac^7d^2x^3-3\left(14\,bc^6de-5\,bc^4e^2\right)x^4-2\left(35\,bc^6d^2-42\,bc^4de+15\,bc^2e\right.}{420\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/420*(60*a*c^7*e^2*x^7 + 168*a*c^7*d*e*x^5 - 10*b*c^6*e^2*x^6 + 140*a*c^7*
d^2*x^3 - 3*(14*b*c^6*d*e - 5*b*c^4*e^2)*x^4 - 2*(35*b*c^6*d^2 - 42*b*c^4*d
*e + 15*b*c^2*e^2)*x^2 + 4*(15*b*c^7*e^2*x^7 + 42*b*c^7*d*e*x^5 + 35*b*c^7*
d^2*x^3)*arctan(c*x) + 2*(35*b*c^4*d^2 - 42*b*c^2*d*e + 15*b*e^2)*log(c^2*x
^2 + 1))/c^7
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 192, normalized size = 1.19

$$\frac{a e^2 x^7}{7}+\frac{2aed x^5}{5}+\frac{a d^2 x^3}{3}+\frac{b \arctan(cx) e^2 x^7}{7}+\frac{2b \arctan(cx) ed x^5}{5}+\frac{b \arctan(cx) d^2 x^3}{3}-\frac{b d^2 x^2}{6c}-\frac{bed x^4}{10c}-\frac{b e^2 x^6}{42c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^2*(a+b*arctan(c*x)),x)
```

```
[Out] 1/7*a*e^2*x^7+2/5*a*e*d*x^5+1/3*a*d^2*x^3+1/7*b*arctan(c*x)*e^2*x^7+2/5*b*a
rctan(c*x)*e*d*x^5+1/3*b*arctan(c*x)*d^2*x^3-1/6*b*d^2*x^2/c-1/10/c*b*e*d*x
^4-1/42*b*e^2*x^6/c+1/5/c^3*b*x^2*d*e+1/28/c^3*b*x^4*e^2-1/14/c^5*b*x^2*e^2
+1/6*b*d^2*ln(c^2*x^2+1)/c^3-1/5/c^5*b*ln(c^2*x^2+1)*e*d+1/14/c^7*b*ln(c^2*
x^2+1)*e^2
```

maxima [A] time = 0.32, size = 181, normalized size = 1.12

$$\frac{1}{7} ae^2x^7+\frac{2}{5} adex^5+\frac{1}{3} ad^2x^3+\frac{1}{6}\left(2 x^3 \arctan(cx) - c\left(\frac{x^2}{c^2} - \frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)bd^2+\frac{1}{10}\left(4 x^5 \arctan(cx) - c\left(\frac{c^2x^4 -}{c^4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e^2*x^7 + 2/5*a*d*e*x^5 + 1/3*a*d^2*x^3 + 1/6*(2*x^3*arctan(c*x) - c*
(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*d^2 + 1/10*(4*x^5*arctan(c*x) - c*((c^2
*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*d*e + 1/84*(12*x^7*arctan(c*
x) - c*((2*c^4*x^6 - 3*c^2*x^4 + 6*x^2)/c^6 - 6*log(c^2*x^2 + 1)/c^8))*b*e^
2
```

mupad [B] time = 0.79, size = 191, normalized size = 1.19

$$\frac{a\,d^2\,x^3}{3}+\frac{a\,e^2\,x^7}{7}+\frac{b\,d^2\,\ln\left(c^2\,x^2+1\right)}{6\,c^3}+\frac{b\,e^2\,\ln\left(c^2\,x^2+1\right)}{14\,c^7}-\frac{b\,d^2\,x^2}{6\,c}-\frac{b\,e^2\,x^6}{42\,c}+\frac{b\,e^2\,x^4}{28\,c^3}-\frac{b\,e^2\,x^2}{14\,c^5}+\frac{2\,a\,d\,e\,x^5}{5}+\frac{b\,d^2\,x^3\,\mathrm{at}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^2,x)
```

```
[Out] (a*d^2*x^3)/3 + (a*e^2*x^7)/7 + (b*d^2*log(c^2*x^2 + 1))/(6*c^3) + (b*e^2*l
og(c^2*x^2 + 1))/(14*c^7) - (b*d^2*x^2)/(6*c) - (b*e^2*x^6)/(42*c) + (b*e^2
*x^4)/(28*c^3) - (b*e^2*x^2)/(14*c^5) + (2*a*d*e*x^5)/5 + (b*d^2*x^3*atan(c
*x))/3 + (b*e^2*x^7*atan(c*x))/7 - (b*d*e*log(c^2*x^2 + 1))/(5*c^5) - (b*d*
e*x^4)/(10*c) + (b*d*e*x^2)/(5*c^3) + (2*b*d*e*x^5*atan(c*x))/5
```

sympy [A] time = 2.74, size = 245, normalized size = 1.52

$$\begin{cases} \frac{ad^2x^3}{3} + \frac{2adex^5}{5} + \frac{ae^2x^7}{7} + \frac{bd^2x^3\operatorname{atan}(cx)}{3} + \frac{2bdex^5\operatorname{atan}(cx)}{5} + \frac{be^2x^7\operatorname{atan}(cx)}{7} - \frac{bd^2x^2}{6c} - \frac{bdex^4}{10c} - \frac{be^2x^6}{42c} + \frac{bd^2\log\left(x^2+\frac{1}{c^2}\right)}{6c^3} + \frac{bdex}{5c^3} \\ a\left(\frac{d^2x^3}{3} + \frac{2dex^5}{5} + \frac{e^2x^7}{7}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**2*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**3/3 + 2*a*d*e*x**5/5 + a*e**2*x**7/7 + b*d**2*x**3*ata
n(c*x)/3 + 2*b*d*e*x**5*atan(c*x)/5 + b*e**2*x**7*atan(c*x)/7 - b*d**2*x**2
/(6*c) - b*d*e*x**4/(10*c) - b*e**2*x**6/(42*c) + b*d**2*log(x**2 + c**(-2)
)/(6*c**3) + b*d*e*x**2/(5*c**3) + b*e**2*x**4/(28*c**3) - b*d*e*log(x**2 +
 c**(-2))/(5*c**5) - b*e**2*x**2/(14*c**5) + b*e**2*log(x**2 + c**(-2))/(14
*c**7), Ne(c, 0)), (a*(d**2*x**3/3 + 2*d*e*x**5/5 + e**2*x**7/7), True))
```

3.1127 $\int x\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=115

$$\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6e}-\frac{b\left(c^2d-e\right)^3\tan^{-1}(cx)}{6c^6e}-\frac{bex^3\left(3c^2d-e\right)}{18c^3}-\frac{bx\left(3c^4d^2-3c^2de+e^2\right)}{6c^5}-\frac{be^2x^5}{30c}$$

```
[Out] -1/6*b*(3*c^4*d^2-3*c^2*d*e+e^2)*x/c^5-1/18*b*(3*c^2*d-e)*e*x^3/c^3-1/30*b*
e^2*x^5/c-1/6*b*(c^2*d-e)^3*arctan(c*x)/c^6/e+1/6*(e*x^2+d)^3*(a+b*arctan(c
*x))/e
```

Rubi [A] time = 0.11, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4974, 390, 203}

$$\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6e}-\frac{bx\left(3c^4d^2-3c^2de+e^2\right)}{6c^5}-\frac{bex^3\left(3c^2d-e\right)}{18c^3}-\frac{b\left(c^2d-e\right)^3\tan^{-1}(cx)}{6c^6e}-\frac{be^2x^5}{30c}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(3*c^4*d^2 - 3*c^2*d*e + e^2)*x)/(6*c^5) - (b*(3*c^2*d - e)*e*x^3)/(18*
c^3) - (b*e^2*x^5)/(30*c) - (b*(c^2*d - e)^3*ArcTan[c*x])/(6*c^6*e) + ((d +
 e*x^2)^3*(a + b*ArcTan[c*x]))/(6*e)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Int[PolynomialDivide[(a + b*x^n)^p, (c + d*x^n)^(-q), x], x] /; FreeQ[{a
, b, c, d}, x] && NeQ[b*c - a*d, 0] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[q,
0] && GeQ[p, -q]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)dx = \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6e} - \frac{(bc)\int\frac{\left(d+ex^2\right)^3}{1+c^2x^2}dx}{6e}$$
$$= \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6e} - \frac{(bc)\int\left(\frac{e\left(3c^4d^2-3c^2de+e^2\right)}{c^6}+\frac{\left(3c^2d-e\right)e^2x^2}{c^4}+\frac{e^3}{c}\right.}{6e}$$
$$= -\frac{b\left(3c^4d^2-3c^2de+e^2\right)x}{6c^5} - \frac{b\left(3c^2d-e\right)ex^3}{18c^3} - \frac{be^2x^5}{30c} + \frac{\left(d+ex^2\right)^3\left(a+\right.}{6e}$$
$$= -\frac{b\left(3c^4d^2-3c^2de+e^2\right)x}{6c^5} - \frac{b\left(3c^2d-e\right)ex^3}{18c^3} - \frac{be^2x^5}{30c} - \frac{b\left(c^2d-e\right)^3\tan}{6c^6e}$$

Mathematica [A] time = 0.10, size = 140, normalized size = 1.22

$$\frac{cx\left(15ac^5x\left(3d^2+3dex^2+e^2x^4\right)-3bc^4\left(15d^2+5dex^2+e^2x^4\right)+5bc^2e\left(9d+ex^2\right)-15be^2\right)+15b\tan^{-1}(cx)\left(c^6\right.}{90c^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c*x*(-15*b*e^2 + 5*b*c^2*e*(9*d + e*x^2) + 15*a*c^5*x*(3*d^2 + 3*d*e*x^2 +
 e^2*x^4) - 3*b*c^4*(15*d^2 + 5*d*e*x^2 + e^2*x^4)) + 15*b*(3*c^4*d^2 - 3*c
^2*d*e + e^2 + c^6*(3*d^2*x^2 + 3*d*e*x^4 + e^2*x^6))*ArcTan[c*x])/(90*c^6)
```

fricas [A] time = 0.43, size = 166, normalized size = 1.44

$$\frac{15\,ac^6e^2x^6+45\,ac^6dex^4-3\,bc^5e^2x^5+45\,ac^6d^2x^2-5\left(3\,bc^5de-bc^3e^2\right)x^3-15\left(3\,bc^5d^2-3\,bc^3de+bce^2\right)x+15}{90\,c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/90*(15*a*c^6*e^2*x^6 + 45*a*c^6*d*e*x^4 - 3*b*c^5*e^2*x^5 + 45*a*c^6*d^2*
x^2 - 5*(3*b*c^5*d*e - b*c^3*e^2)*x^3 - 15*(3*b*c^5*d^2 - 3*b*c^3*d*e + b*c
*e^2)*x + 15*(b*c^6*e^2*x^6 + 3*b*c^6*d*e*x^4 + 3*b*c^6*d^2*x^2 + 3*b*c^4*d
^2 - 3*b*c^2*d*e + b*e^2)*arctan(c*x))/c^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 168, normalized size = 1.46

$$\frac{a\,e^2x^6}{6}+\frac{aed\,x^4}{2}+\frac{a\,x^2d^2}{2}+\frac{b\arctan\left(cx\right)e^2x^6}{6}+\frac{b\arctan\left(cx\right)ed\,x^4}{2}+\frac{b\arctan\left(cx\right)d^2x^2}{2}-\frac{b\,e^2x^5}{30c}-\frac{b\,x^3de}{6c}-\frac{b\,d^2x}{2c}+\frac{b\,x}{18}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^2*(a+b*arctan(c*x)),x)
```

```
[Out] 1/6*a*e^2*x^6+1/2*a*e*d*x^4+1/2*a*x^2*d^2+1/6*b*arctan(c*x)*e^2*x^6+1/2*b*a
rctan(c*x)*e*d*x^4+1/2*b*arctan(c*x)*d^2*x^2-1/30*b*e^2*x^5/c-1/6/c*b*x^3*d
*e-1/2*b*d^2*x/c+1/18/c^3*b*x^3*e^2+1/2/c^3*b*e*d*x-1/6/c^5*b*x*e^2+1/2*b*d
^2*arctan(c*x)/c^2-1/2/c^4*b*arctan(c*x)*e*d+1/6/c^6*b*arctan(c*x)*e^2
```

maxima [A] time = 0.43, size = 156, normalized size = 1.36

$$\frac{1}{6}\,ae^2x^6+\frac{1}{2}\,adex^4+\frac{1}{2}\,ad^2x^2+\frac{1}{2}\left(x^2\arctan\left(cx\right)-c\left(\frac{x}{c^2}-\frac{\arctan\left(cx\right)}{c^3}\right)\right)bd^2+\frac{1}{6}\left(3\,x^4\arctan\left(cx\right)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/6*a*e^2*x^6 + 1/2*a*d*e*x^4 + 1/2*a*d^2*x^2 + 1/2*(x^2*arctan(c*x) - c*(x
/c^2 - arctan(c*x)/c^3))*b*d^2 + 1/6*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x
)/c^4 + 3*arctan(c*x)/c^5))*b*d*e + 1/90*(15*x^6*arctan(c*x) - c*((3*c^4*x^
5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*e^2
```

mupad [B] time = 0.46, size = 167, normalized size = 1.45

$$\frac{a\,d^2\,x^2}{2}+\frac{a\,e^2\,x^6}{6}-\frac{b\,e^2\,x^5}{30\,c}+\frac{b\,e^2\,x^3}{18\,c^3}+\frac{a\,d\,e\,x^4}{2}-\frac{b\,d^2\,x}{2\,c}-\frac{b\,e^2\,x}{6\,c^5}+\frac{b\,d^2\,\mathrm{atan}\left(c\,x\right)}{2\,c^2}+\frac{b\,e^2\,\mathrm{atan}\left(c\,x\right)}{6\,c^6}+\frac{b\,d^2\,x^2\,\mathrm{atan}\left(c\,x\right)}{2}+\frac{b\,e^2\,x}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*x^2)^2,x)
```

```
[Out] (a*d^2*x^2)/2 + (a*e^2*x^6)/6 - (b*e^2*x^5)/(30*c) + (b*e^2*x^3)/(18*c^3) +
 (a*d*e*x^4)/2 - (b*d^2*x)/(2*c) - (b*e^2*x)/(6*c^5) + (b*d^2*atan(c*x))/(2
*c^2) + (b*e^2*atan(c*x))/(6*c^6) + (b*d^2*x^2*atan(c*x))/2 + (b*e^2*x^6*at
an(c*x))/6 - (b*d*e*x^3)/(6*c) + (b*d*e*x)/(2*c^3) - (b*d*e*atan(c*x))/(2*c
^4) + (b*d*e*x^4*atan(c*x))/2
```

sympy [A] time = 2.50, size = 219, normalized size = 1.90

$$\begin{cases}\frac{ad^2x^2}{2}+\frac{adex^4}{2}+\frac{ae^2x^6}{6}+\frac{bd^2x^2\,\mathrm{atan}\,(cx)}{2}+\frac{bdex^4\,\mathrm{atan}\,(cx)}{2}+\frac{be^2x^6\,\mathrm{atan}\,(cx)}{6}-\frac{bd^2x}{2c}-\frac{bdex^3}{6c}-\frac{be^2x^5}{30c}+\frac{bd^2\,\mathrm{atan}\,(cx)}{2c^2}+\frac{bdex}{2c^3}+\frac{be^2x^3}{18c^3} \\ a\left(\frac{d^2x^2}{2}+\frac{dex^4}{2}+\frac{e^2x^6}{6}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**2*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x**2/2 + a*d*e*x**4/2 + a*e**2*x**6/6 + b*d**2*x**2*atan(
c*x)/2 + b*d*e*x**4*atan(c*x)/2 + b*e**2*x**6*atan(c*x)/6 - b*d**2*x/(2*c)
- b*d*e*x**3/(6*c) - b*e**2*x**5/(30*c) + b*d**2*atan(c*x)/(2*c**2) + b*d*e
*x/(2*c**3) + b*e**2*x**3/(18*c**3) - b*d*e*atan(c*x)/(2*c**4) - b*e**2*x/(
6*c**5) + b*e**2*atan(c*x)/(6*c**6), Ne(c, 0)), (a*(d**2*x**2/2 + d*e*x**4/
2 + e**2*x**6/6), True))
```

3.1128 $\int \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=124

$$d^2x\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\tan^{-1}(cx)\right)-\frac{bex^2\left(10c^2d-3e\right)}{30c^3}-\frac{b\left(15c^4d^2-10c^2d\right.}{}$$

```
[Out] -1/30*b*(10*c^2*d-3*e)*e*x^2/c^3-1/20*b*e^2*x^4/c+d^2*x*(a+b*arctan(c*x))+2
/3*d*e*x^3*(a+b*arctan(c*x))+1/5*e^2*x^5*(a+b*arctan(c*x))-1/30*b*(15*c^4*d
^2-10*c^2*d*e+3*e^2)*ln(c^2*x^2+1)/c^5
```

Rubi [A] time = 0.16, antiderivative size = 124, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.278, Rules used = {194, 4912, 1594, 1247, 698}

$$d^2x\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(15c^4d^2-10c^2de+3e^2\right)\log\left(c^2x^2+\right.}{30c^5}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(10*c^2*d - 3*e)*e*x^2)/(30*c^3) - (b*e^2*x^4)/(20*c) + d^2*x*(a + b*Ar
cTan[c*x]) + (2*d*e*x^3*(a + b*ArcTan[c*x]))/3 + (e^2*x^5*(a + b*ArcTan[c*x
]))/5 - (b*(15*c^4*d^2 - 10*c^2*d*e + 3*e^2)*Log[1 + c^2*x^2])/(30*c^5)
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 698

```
Int[((d_.) + (e_.)*(x_))^(m_)*((a_.) + (b_.)*(x_) + (c_.)*(x_)^2)^(p_.), x_
Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(a + b*x + c*x^2)^p, x], x] /; F
reeQ[{a, b, c, d, e, m}, x] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a
*e^2, 0] && NeQ[2*c*d - b*e, 0] && IntegerQ[p] && (GtQ[p, 0] || (EqQ[a, 0]
&& IntegerQ[m]))
```

Rule 1247

```
Int[(x_)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_)^4)^(
p_.), x_Symbol] :> Dist[1/2, Subst[Int[(d + e*x)^q*(a + b*x + c*x^2)^p, x],
 x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x]
```

Rule 1594

```
Int[(u_.)*((a_.)*(x_)^(p_.) + (b_.)*(x_)^(q_.) + (c_.)*(x_)^(r_.))^(n_.), x
_Symbol] :> Int[u*x^(n*p)*(a + b*x^(q - p) + c*x^(r - p))^n, x] /; FreeQ[{a
, b, c, p, q, r}, x] && IntegerQ[n] && PosQ[q - p] && PosQ[r - p]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rubi steps

$$\int \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)\,dx = d^2x\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\tan^{-1}(cx)\right)-$$

$$= d^2x\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\tan^{-1}(cx)\right)-$$

$$= d^2x\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\tan^{-1}(cx)\right)-$$

$$= d^2x\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^2x^5\left(a+b\tan^{-1}(cx)\right)-$$

$$= -\frac{b\left(10c^2d-3e\right)ex^2}{30c^3}-\frac{be^2x^4}{20c}+d^2x\left(a+b\tan^{-1}(cx)\right)+\frac{2}{3}dex^3\left(a+b\tan^{-1}(c\right.$$

Mathematica [A] time = 0.10, size = 130, normalized size = 1.05

$$\frac{c^2x\left(4ac^3\left(15d^2+10dex^2+3e^2x^4\right)+bex\left(6e-c^2\left(20d+3ex^2\right)\right)\right)+4bc^5x\tan^{-1}(cx)\left(15d^2+10dex^2+3e^2x^4\right)-2b}{60c^5}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c^2*x*(4*a*c^3*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) + b*e*x*(6*e - c^2*(20*d
+ 3*e*x^2))) + 4*b*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4)*ArcTan[c*x] - 2*
b*(15*c^4*d^2 - 10*c^2*d*e + 3*e^2)*Log[1 + c^2*x^2])/(60*c^5)
```

fricas [A] time = 0.52, size = 150, normalized size = 1.21

$$\frac{12\,ac^5e^2x^5+40\,ac^5dex^3-3\,bc^4e^2x^4+60\,ac^5d^2x-2\left(10\,bc^4de-3\,bc^2e^2\right)x^2+4\left(3\,bc^5e^2x^5+10\,bc^5dex^3+15\,bc^5d^2\right.}{60\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/60*(12*a*c^5*e^2*x^5 + 40*a*c^5*d*e*x^3 - 3*b*c^4*e^2*x^4 + 60*a*c^5*d^2*
x - 2*(10*b*c^4*d*e - 3*b*c^2*e^2)*x^2 + 4*(3*b*c^5*e^2*x^5 + 10*b*c^5*d*e*
x^3 + 15*b*c^5*d^2*x)*arctan(c*x) - 2*(15*b*c^4*d^2 - 10*b*c^2*d*e + 3*b*e^
2)*log(c^2*x^2 + 1))/c^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 151, normalized size = 1.22

$$\frac{a\,x^5e^2}{5}+\frac{2a\,x^3de}{3}+ax\,d^2+\frac{b\arctan\left(cx\right)x^5e^2}{5}+\frac{2b\arctan\left(cx\right)x^3de}{3}+b\arctan\left(cx\right)d^2x-\frac{b\,x^2de}{3c}-\frac{b\,e^2x^4}{20c}+\frac{b\,x^2e^2}{10c^3}-\frac{b\ln\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x)),x)
```

```
[Out] 1/5*a*x^5*e^2+2/3*a*x^3*d*e+a*x*d^2+1/5*b*arctan(c*x)*x^5*e^2+2/3*b*arctan(
c*x)*x^3*d*e+b*arctan(c*x)*d^2*x-1/3/c*b*x^2*d*e-1/20*b*e^2*x^4/c+1/10/c^3*
b*x^2*e^2-1/2/c*b*ln(c^2*x^2+1)*d^2+1/3/c^3*b*ln(c^2*x^2+1)*e*d-1/10/c^5*b*
ln(c^2*x^2+1)*e^2
```

maxima [A] time = 0.40, size = 147, normalized size = 1.19

$$\frac{1}{5}ae^2x^5+\frac{2}{3}adex^3+\frac{1}{3}\left(2x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)bde+\frac{1}{20}\left(4x^5\arctan(cx)-c\left(\frac{c^2x^4-2x^2}{c^4}+\frac{2}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/5*a*e^2*x^5 + 2/3*a*d*e*x^3 + 1/3*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c
^2*x^2 + 1)/c^4))*b*d*e + 1/20*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^
4 + 2*log(c^2*x^2 + 1)/c^6))*b*e^2 + a*d^2*x + 1/2*(2*c*x*arctan(c*x) - log
(c^2*x^2 + 1))*b*d^2/c
```

mupad [B] time = 0.66, size = 150, normalized size = 1.21

$$\frac{a\,e^2\,x^5}{5}+a\,d^2\,x-\frac{b\,d^2\,\ln\left(c^2\,x^2+1\right)}{2\,c}-\frac{b\,e^2\,\ln\left(c^2\,x^2+1\right)}{10\,c^5}-\frac{b\,e^2\,x^4}{20\,c}+\frac{b\,e^2\,x^2}{10\,c^3}+\frac{2\,a\,d\,e\,x^3}{3}+b\,d^2\,x\,\mathrm{atan}\left(c\,x\right)+\frac{b\,e^2\,x^5\,\mathrm{ata}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*x^2)^2,x)
```

```
[Out] (a*e^2*x^5)/5 + a*d^2*x - (b*d^2*log(c^2*x^2 + 1))/(2*c) - (b*e^2*log(c^2*x
^2 + 1))/(10*c^5) - (b*e^2*x^4)/(20*c) + (b*e^2*x^2)/(10*c^3) + (2*a*d*e*x^
3)/3 + b*d^2*x*atan(c*x) + (b*e^2*x^5*atan(c*x))/5 + (b*d*e*log(c^2*x^2 + 1
))/(3*c^3) - (b*d*e*x^2)/(3*c) + (2*b*d*e*x^3*atan(c*x))/3
```

sympy [A] time = 1.63, size = 194, normalized size = 1.56

$$\begin{cases} ad^2x+\frac{2adex^3}{3}+\frac{ae^2x^5}{5}+bd^2x\,\mathrm{atan}\,(cx)+\frac{2bdex^3\,\mathrm{atan}\,(cx)}{3}+\frac{be^2x^5\,\mathrm{atan}\,(cx)}{5}-\frac{bd^2\log\left(x^2+\frac{1}{c^2}\right)}{2c}-\frac{bdex^2}{3c}-\frac{be^2x^4}{20c}+\frac{bde\log\left(x^2\right.}{3c^3} \\ a\left(d^2x+\frac{2dex^3}{3}+\frac{e^2x^5}{5}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**2*x + 2*a*d*e*x**3/3 + a*e**2*x**5/5 + b*d**2*x*atan(c*x) +
 2*b*d*e*x**3*atan(c*x)/3 + b*e**2*x**5*atan(c*x)/5 - b*d**2*log(x**2 + c**
(-2))/(2*c) - b*d*e*x**2/(3*c) - b*e**2*x**4/(20*c) + b*d*e*log(x**2 + c**(
-2))/(3*c**3) + b*e**2*x**2/(10*c**3) - b*e**2*log(x**2 + c**(-2))/(10*c**5
), Ne(c, 0)), (a*(d**2*x + 2*d*e*x**3/3 + e**2*x**5/5), True))
```

3.1129 $\int \frac{(d+ex^2)^2(a+b\tan^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=137

$$dex^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\tan^{-1}(cx)\right)+ad^2\log(x)-\frac{be^2\tan^{-1}(cx)}{4c^4}+\frac{be^2x}{4c^3}+\frac{bde\tan^{-1}(cx)}{c^2}+\frac{1}{2}ibd^2\text{Li}_2(-icx)$$

```
[Out] -b*d*e*x/c+1/4*b*e^2*x/c^3-1/12*b*e^2*x^3/c+b*d*e*arctan(c*x)/c^2-1/4*b*e^2
*arctan(c*x)/c^4+d*e*x^2*(a+b*arctan(c*x))+1/4*e^2*x^4*(a+b*arctan(c*x))+a*
d^2*ln(x)+1/2*I*b*d^2*polylog(2,-I*c*x)-1/2*I*b*d^2*polylog(2,I*c*x)
```

Rubi [A] time = 0.18, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4980, 4848, 2391, 4852, 321, 203, 302}

$$\frac{1}{2}ibd^2\text{PolyLog}(2,-icx)-\frac{1}{2}ibd^2\text{PolyLog}(2,icx)+dex^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\tan^{-1}(cx)\right)+ad^2\log(x)+\frac{bde}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] -((b*d*e*x)/c) + (b*e^2*x)/(4*c^3) - (b*e^2*x^3)/(12*c) + (b*d*e*ArcTan[c*x
])/c^2 - (b*e^2*ArcTan[c*x])/(4*c^4) + d*e*x^2*(a + b*ArcTan[c*x]) + (e^2*x
^4*(a + b*ArcTan[c*x]))/4 + a*d^2*Log[x] + (I/2)*b*d^2*PolyLog[2, (-I)*c*x]
 - (I/2)*b*d^2*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{x}\,dx = \int\left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2dex\left(a+b\tan^{-1}(cx)\right)+e^2x^3\left(a+b\tan^{-1}(cx)\right.\right.$$

$$= d^2\int\frac{a+b\tan^{-1}(cx)}{x}\,dx+(2de)\int x\left(a+b\tan^{-1}(cx)\right)\,dx+e^2\int x^3\left(a+\right.$$

$$= dex^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\tan^{-1}(cx)\right)+ad^2\log(x)+\frac{1}{2}\left(ibd^2\right)$$

$$= -\frac{bdex}{c}+dex^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\tan^{-1}(cx)\right)+ad^2\log(x)+$$

$$= -\frac{bdex}{c}+\frac{be^2x}{4c^3}-\frac{be^2x^3}{12c}+\frac{bde\tan^{-1}(cx)}{c^2}+dex^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^2x^4$$

$$= -\frac{bdex}{c}+\frac{be^2x}{4c^3}-\frac{be^2x^3}{12c}+\frac{bde\tan^{-1}(cx)}{c^2}-\frac{be^2\tan^{-1}(cx)}{4c^4}+dex^2\left(a+b\tan\right.$$

Mathematica [A] time = 0.11, size = 123, normalized size = 0.90

$$dex^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^2x^4\left(a+b\tan^{-1}(cx)\right)+ad^2\log(x)-\frac{bde\left(cx-\tan^{-1}(cx)\right)}{c^2}-\frac{be^2\left(c^3x^3-3cx+3\tan^{-1}(c\right.}{12c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] -((b*d*e*(c*x - ArcTan[c*x]))/c^2) - (b*e^2*(-3*c*x + c^3*x^3 + 3*ArcTan[c*
x]))/(12*c^4) + d*e*x^2*(a + b*ArcTan[c*x]) + (e^2*x^4*(a + b*ArcTan[c*x]))
/4 + a*d^2*Log[x] + (I/2)*b*d^2*PolyLog[2, (-I)*c*x] - (I/2)*b*d^2*PolyLog[
2, I*c*x]
```

fricas [F] time = 0.67, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\arctan(cx)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.06, size = 187, normalized size = 1.36

$$\frac{a\,x^{4}e^{2}}{4}+aed\,x^{2}+a\,d^{2}\ln\left(cx\right)+\frac{b\arctan\left(cx\right)x^{4}e^{2}}{4}+b\arctan\left(cx\right)x^{2}de+b\arctan\left(cx\right)d^{2}\ln\left(cx\right)-\frac{b\,e^{2}x^{3}}{12c}-\frac{bdex}{c}+\frac{b\,e^{2}x}{4c^{3}}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x,x)
```

```
[Out] 1/4*a*x^4*e^2+a*e*d*x^2+a*d^2*ln(c*x)+1/4*b*arctan(c*x)*x^4*e^2+b*arctan(c*
x)*x^2*d*e+b*arctan(c*x)*d^2*ln(c*x)-1/12*b*e^2*x^3/c-b*d*e*x/c+1/4*b*e^2*x
/c^3+b*d*e*arctan(c*x)/c^2-1/4*b*e^2*arctan(c*x)/c^4+1/2*I*b*d^2*ln(c*x)*ln
(1+I*c*x)-1/2*I*b*d^2*ln(c*x)*ln(1-I*c*x)+1/2*I*b*d^2*dilog(1+I*c*x)-1/2*I*
b*d^2*dilog(1-I*c*x)
```

maxima [A] time = 0.64, size = 172, normalized size = 1.26

$$\frac{1}{4}\,ae^{2}x^{4}+adex^{2}+ad^{2}\log(x)-\frac{bc^{3}e^{2}x^{3}+3\,\pi bc^{4}d^{2}\log\left(c^{2}x^{2}+1\right)-12\,bc^{4}d^{2}\arctan\left(cx\right)\log\left(cx\right)+6i\,bc^{4}d^{2}\mathrm{Li}_{2}\left(i\,cx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/4*a*e^2*x^4 + a*d*e*x^2 + a*d^2*log(x) - 1/12*(b*c^3*e^2*x^3 + 3*pi*b*c^4
*d^2*log(c^2*x^2 + 1) - 12*b*c^4*d^2*arctan(c*x)*log(c*x) + 6*I*b*c^4*d^2*d
ilog(I*c*x + 1) - 6*I*b*c^4*d^2*dilog(-I*c*x + 1) + 3*(4*b*c^3*d*e - b*c*e^
2)*x - 3*(b*c^4*e^2*x^4 + 4*b*c^4*d*e*x^2 + 4*b*c^2*d*e - b*e^2)*arctan(c*x
))/c^4
```

mupad [B] time = 0.71, size = 157, normalized size = 1.15

$$\begin{cases} \frac{a\left(4\,d^{2}\,\ln(x)+e^{2}\,x^{4}+4\,d\,e\,x^{2}\right)}{4} \\ \frac{a\left(4\,d^{2}\,\ln(x)+e^{2}\,x^{4}+4\,d\,e\,x^{2}\right)}{4}-2\,b\,d\,e\left(\frac{x}{2\,c}-\mathrm{atan}\left(c\,x\right)\left(\frac{1}{2\,c^{2}}+\frac{x^{2}}{2}\right)\right)-\frac{b\,e^{2}\left(3\,\mathrm{atan}(c\,x)-3\,c\,x+c^{3}\,x^{3}\right)}{12\,c^{4}}+\frac{b\,e^{2}\,x^{4}\,\mathrm{atan}(c\,x)}{4}-\frac{b\,d^{2}\,\mathrm{Li}_{2}(1-c}{2} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x,x)
```

```
[Out] piecewise(c == 0, (a*(4*d^2*log(x) + e^2*x^4 + 4*d*e*x^2))/4, c ~= 0, (a*(4
*d^2*log(x) + e^2*x^4 + 4*d*e*x^2))/4 - (b*d^2*dilog(- c*x*1i + 1)*1i)/2 +
(b*d^2*dilog(c*x*1i + 1)*1i)/2 - 2*b*d*e*(x/(2*c) - atan(c*x)*(1/(2*c^2) +
x^2/2)) - (b*e^2*(3*atan(c*x) - 3*c*x + c^3*x^3))/(12*c^4) + (b*e^2*x^4*ata
n(c*x))/4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\,\mathrm{atan}\left(cx\right)\right)\left(d+ex^{2}\right)^{2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**2/x, x)
```

3.1130 $\int \frac{(d+ex^2)^2(a+b\tan^{-1}(cx))}{x^2}\,dx$

Optimal. Leaf size=109

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2dex\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(3c^4d^2+6c^2de-e^2\right)\log\left(c^2x^2+1\right)}{6c^3}+bc$$

```
[Out] -1/6*b*e^2*x^2/c-d^2*(a+b*arctan(c*x))/x+2*d*e*x*(a+b*arctan(c*x))+1/3*e^2*
x^3*(a+b*arctan(c*x))+b*c*d^2*ln(x)-1/6*b*(3*c^4*d^2+6*c^2*d*e-e^2)*ln(c^2*
x^2+1)/c^3
```

Rubi [A] time = 0.16, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {270, 4976, 1251, 893}

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2dex\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(3c^4d^2+6c^2de-e^2\right)\log\left(c^2x^2+1\right)}{6c^3}+bc$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -(b*e^2*x^2)/(6*c) - (d^2*(a + b*ArcTan[c*x]))/x + 2*d*e*x*(a + b*ArcTan[c*
x]) + (e^2*x^3*(a + b*ArcTan[c*x]))/3 + b*c*d^2*Log[x] - (b*(3*c^4*d^2 + 6*
c^2*d*e - e^2)*Log[1 + c^2*x^2])/(6*c^3)
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx = -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2dex\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\tan^{-1}(cx)\right)$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2dex\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\tan^{-1}(cx)\right)$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2dex\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\tan^{-1}(cx)\right)$$

$$= -\frac{be^2x^2}{6c}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x}+2dex\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^2x^3\left(a+b\ \mathrm{ta}\right.$$

Mathematica [A] time = 0.11, size = 114, normalized size = 1.05

$$\frac{1}{6}\left(-\frac{6ad^2}{x}+12adex+2ae^2x^3+\frac{b\left(-3c^4d^2-6c^2de+e^2\right)\log\left(c^2x^2+1\right)}{c^3}+\frac{2b\tan^{-1}(cx)\left(-3d^2+6dex^2+e^2x^4\right)}{x}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] ((-6*a*d^2)/x + 12*a*d*e*x - (b*e^2*x^2)/c + 2*a*e^2*x^3 + (2*b*(-3*d^2 + 6
*d*e*x^2 + e^2*x^4)*ArcTan[c*x])/x + 6*b*c*d^2*Log[x] + (b*(-3*c^4*d^2 - 6*
c^2*d*e + e^2)*Log[1 + c^2*x^2])/c^3)/6
```

fricas [A] time = 0.46, size = 140, normalized size = 1.28

$$\frac{2\,ac^3e^2x^4+6\,bc^4d^2x\log(x)+12\,ac^3dex^2-bc^2e^2x^3-6\,ac^3d^2-\left(3\,bc^4d^2+6\,bc^2de-be^2\right)x\log\left(c^2x^2+1\right)+2\left(b\right.}{6\,c^3x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/6*(2*a*c^3*e^2*x^4 + 6*b*c^4*d^2*x*log(x) + 12*a*c^3*d*e*x^2 - b*c^2*e^2*
x^3 - 6*a*c^3*d^2 - (3*b*c^4*d^2 + 6*b*c^2*d*e - b*e^2)*x*log(c^2*x^2 + 1)
+ 2*(b*c^3*e^2*x^4 + 6*b*c^3*d*e*x^2 - 3*b*c^3*d^2)*arctan(c*x))/(c^3*x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 138, normalized size = 1.27

$$\frac{a\,e^2x^3}{3}+2aedx-\frac{a\,d^2}{x}+\frac{b\arctan(cx)\,x^3e^2}{3}+2b\arctan(cx)\,edx-\frac{b\arctan(cx)\,d^2}{x}-\frac{b\,e^2x^2}{6c}+cb\,d^2\ln(cx)-\frac{cb\ln\left(c^2x^2\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] 1/3*a*e^2*x^3+2*a*e*d*x-a*d^2/x+1/3*b*arctan(c*x)*x^3*e^2+2*b*arctan(c*x)*e
*d*x-b*arctan(c*x)*d^2/x-1/6*b*e^2*x^2/c+c*b*d^2*ln(c*x)-1/2*c*b*ln(c^2*x^2
+1)*d^2-b/c*ln(c^2*x^2+1)*e*d+1/6*b/c^3*ln(c^2*x^2+1)*e^2
```

maxima [A] time = 0.33, size = 130, normalized size = 1.19

$$\frac{1}{3}ae^2x^3-\frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bd^2+\frac{1}{6}\left(2x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)be^2+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/3*a*e^2*x^3 - 1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d
^2 + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*e^2 + 2
*a*d*e*x + (2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d*e/c - a*d^2/x
```

mupad [B] time = 0.70, size = 135, normalized size = 1.24

$$\frac{a\,e^2\,x^3}{3}-\frac{a\,d^2}{x}+2\,a\,d\,e\,x+\frac{b\,e^2\,\ln\left(c^2\,x^2+1\right)}{6\,c^3}-\frac{b\,e^2\,x^2}{6\,c}-\frac{b\,c\,d^2\,\ln\left(c^2\,x^2+1\right)}{2}+b\,c\,d^2\,\ln(x)-\frac{b\,d^2\,\mathrm{atan}\,(c\,x)}{x}+\frac{b\,e^2\,x^3\,\mathrm{atan}}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x^2,x)
```

```
[Out] (a*e^2*x^3)/3 - (a*d^2)/x + 2*a*d*e*x + (b*e^2*log(c^2*x^2 + 1))/(6*c^3) -
(b*e^2*x^2)/(6*c) - (b*c*d^2*log(c^2*x^2 + 1))/2 + b*c*d^2*log(x) - (b*d^2*
atan(c*x))/x + (b*e^2*x^3*atan(c*x))/3 - (b*d*e*log(c^2*x^2 + 1))/c + 2*b*d
*e*x*atan(c*x)
```

sympy [A] time = 1.83, size = 165, normalized size = 1.51

$$\begin{cases} -\frac{ad^2}{x}+2adex+\frac{ae^2x^3}{3}+bcd^2\log(x)-\frac{bcd^2\log\left(x^2+\frac{1}{c^2}\right)}{2}-\frac{bd^2\operatorname{atan}(cx)}{x}+2bdex\operatorname{atan}(cx)+\frac{be^2x^3\operatorname{atan}(cx)}{3}-\frac{bde\log\left(x^2+\frac{1}{c^2}\right)}{c} \\ a\left(-\frac{d^2}{x}+2dex+\frac{e^2x^3}{3}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x**2,x)
```

```
[Out] Piecewise((-a*d**2/x + 2*a*d*e*x + a*e**2*x**3/3 + b*c*d**2*log(x) - b*c*d*
*2*log(x**2 + c**(-2))/2 - b*d**2*atan(c*x)/x + 2*b*d*e*x*atan(c*x) + b*e**
2*x**3*atan(c*x)/3 - b*d*e*log(x**2 + c**(-2))/c - b*e**2*x**2/(6*c) + b*e*
*2*log(x**2 + c**(-2))/(6*c**3), Ne(c, 0)), (a*(-d**2/x + 2*d*e*x + e**2*x*
*3/3), True))
```

3.1131 $\int \frac{(d+ex^2)^2 (a+b\tan^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=128

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\tan^{-1}(cx)\right)+2ade\log(x)-\frac{1}{2}bc^2d^2\tan^{-1}(cx)+\frac{be^2\tan^{-1}(cx)}{2c^2}-\frac{bcd^2}{2x}+ibde\mathrm{Li}_2($$

```
[Out] -1/2*b*c*d^2/x-1/2*b*e^2*x/c-1/2*b*c^2*d^2*arctan(c*x)+1/2*b*e^2*arctan(c*x
)/c^2-1/2*d^2*(a+b*arctan(c*x))/x^2+1/2*e^2*x^2*(a+b*arctan(c*x))+2*a*d*e*l
n(x)+I*b*d*e*polylog(2,-I*c*x)-I*b*d*e*polylog(2,I*c*x)
```

Rubi [A] time = 0.16, antiderivative size = 128, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4980, 4852, 325, 203, 4848, 2391, 321}

$$ibde\text{PolyLog}(2,-icx)-ibde\text{PolyLog}(2,icx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\tan^{-1}(cx)\right)+2ade\log(x)-\frac{1}{2}bc^2$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -(b*c*d^2)/(2*x) - (b*e^2*x)/(2*c) - (b*c^2*d^2*ArcTan[c*x])/2 + (b*e^2*Arc
Tan[c*x])/(2*c^2) - (d^2*(a + b*ArcTan[c*x]))/(2*x^2) + (e^2*x^2*(a + b*Arc
Tan[c*x]))/2 + 2*a*d*e*Log[x] + I*b*d*e*PolyLog[2, (-I)*c*x] - I*b*d*e*Poly
Log[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+ex^2)^2\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx = \int \left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x^3}+\frac{2de\left(a+b\tan^{-1}(cx)\right)}{x}+e^2x\left(a+b\tan^{-1}(cx)\right)\right)dx$$

$$= d^2\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx+(2de)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+e^2\int x\left(a+b\tan^{-1}\right.$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\tan^{-1}(cx)\right)+2ade\log(x)+\frac{1}{2}\left(bcd^2\right)\int$$

$$= -\frac{bcd^2}{2x}-\frac{be^2x}{2c}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\tan^{-1}(cx)\right)+2ade\log($$

$$= -\frac{bcd^2}{2x}-\frac{be^2x}{2c}-\frac{1}{2}bc^2d^2\tan^{-1}(cx)+\frac{be^2\tan^{-1}(cx)}{2c^2}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{2x^2}+$$

Mathematica [C] time = 0.12, size = 118, normalized size = 0.92

$$\frac{1}{2}\left(-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x^2}+e^2x^2\left(a+b\tan^{-1}(cx)\right)+4ade\log(x)-\frac{bcd^2\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)}{x}-\frac{be^2\left(cx-\tan^{-1}(cx\right.}{c^2}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] (-((b*e^2*(c*x - ArcTan[c*x]))/c^2) - (d^2*(a + b*ArcTan[c*x]))/x^2 + e^2*x
^2*(a + b*ArcTan[c*x]) - (b*c*d^2*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2
)])/x + 4*a*d*e*Log[x] + (2*I)*b*d*e*PolyLog[2, (-I)*c*x] - (2*I)*b*d*e*Pol
yLog[2, I*c*x])/2
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\arctan(cx)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 178, normalized size = 1.39

$$\frac{a\,x^2e^2}{2}+2aed\ln(cx)-\frac{a\,d^2}{2x^2}+\frac{b\arctan(cx)\,x^2e^2}{2}+2b\arctan(cx)\,ed\ln(cx)-\frac{b\arctan(cx)\,d^2}{2x^2}-\frac{b\,e^2x}{2c}-\frac{bc\,d^2}{2x}-\frac{b\,c^2d^2}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] 1/2*a*x^2*e^2+2*a*e*d*ln(c*x)-1/2*a*d^2/x^2+1/2*b*arctan(c*x)*x^2*e^2+2*b*a
rctan(c*x)*e*d*ln(c*x)-1/2*b*arctan(c*x)*d^2/x^2-1/2*b*e^2*x/c-1/2*b*c*d^2/
x-1/2*b*c^2*d^2*arctan(c*x)+1/2*b*e^2*arctan(c*x)/c^2+I*b*e*d*ln(c*x)*ln(1+
I*c*x)-I*b*e*d*ln(c*x)*ln(1-I*c*x)+I*b*e*d*dilog(1+I*c*x)-I*b*e*d*dilog(1-I
*c*x)
```

maxima [A] time = 0.62, size = 153, normalized size = 1.20

$$\frac{1}{2}\,ae^2x^2-\frac{1}{2}\left(\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bd^2+2\,ade\log(x)-\frac{ad^2}{2\,x^2}-\frac{\pi bc^2de\log\left(c^2x^2+1\right)-4\,bc^2de\,\mathrm{arcta}}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a*e^2*x^2 - 1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d^2 + 2*a
*d*e*log(x) - 1/2*a*d^2/x^2 - 1/2*(pi*b*c^2*d*e*log(c^2*x^2 + 1) - 4*b*c^2*
d*e*arctan(c*x)*log(c*x) + 2*I*b*c^2*d*e*dilog(I*c*x + 1) - 2*I*b*c^2*d*e*d
ilog(-I*c*x + 1) + b*c*e^2*x - (b*c^2*e^2*x^2 + b*e^2)*arctan(c*x))/c^2
```

mupad [B] time = 0.68, size = 157, normalized size = 1.23

$$\begin{cases} \frac{a\left(e^2x^4-d^2+4\,d\,e\,x^2\,\ln(x)\right)}{2\,x^2} \\ \frac{a\left(e^2x^4-d^2+4\,d\,e\,x^2\,\ln(x)\right)}{2\,x^2}-b\,e^2\left(\frac{x}{2\,c}-\mathrm{atan}(c\,x)\left(\frac{1}{2\,c^2}+\frac{x^2}{2}\right)\right)-\frac{b\,d^2\left(c^3\,\mathrm{atan}(c\,x)+\frac{c^2}{x}\right)}{2\,c}-\frac{b\,d^2\,\mathrm{atan}(c\,x)}{2\,x^2}-b\,d\,e\,\left(\mathrm{Li}_2(1-c\,x\right. \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x^3,x)
```

```
[Out] piecewise(c == 0, (a*(- d^2 + e^2*x^4 + 4*d*e*x^2*log(x)))/(2*x^2), c ~= 0,
 - b*e^2*(x/(2*c) - atan(c*x)*(1/(2*c^2) + x^2/2)) + (a*(- d^2 + e^2*x^4 +
4*d*e*x^2*log(x)))/(2*x^2) - b*d*e*(dilog(- c*x*1i + 1) - dilog(c*x*1i + 1)
)*1i - (b*d^2*(c^3*atan(c*x) + c^2/x))/(2*c) - (b*d^2*atan(c*x))/(2*x^2))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(a+b\,\mathrm{atan}\,(cx))\left(d+ex^2\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x**3,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**2/x**3, x)
```

3.1132 $\int \frac{(d+ex^2)^2 (a+b\tan^{-1}(cx))}{x^4} \, dx$

Optimal. Leaf size=115

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{x}+e^2x\left(a+b\tan^{-1}(cx)\right)-\frac{1}{3}bcd\log(x)\left(c^2d-6e\right)+\frac{b\left(c^4d^2-6c^2de-3e\right.}{6c}$$

```
[Out] -1/6*b*c*d^2/x^2-1/3*d^2*(a+b*arctan(c*x))/x^3-2*d*e*(a+b*arctan(c*x))/x+e^
2*x*(a+b*arctan(c*x))-1/3*b*c*d*(c^2*d-6*e)*ln(x)+1/6*b*(c^4*d^2-6*c^2*d*e-
3*e^2)*ln(c^2*x^2+1)/c
```

Rubi [A] time = 0.17, antiderivative size = 115, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {270, 4976, 12, 1251, 893}

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{x}+e^2x\left(a+b\tan^{-1}(cx)\right)+\frac{b\left(c^4d^2-6c^2de-3e^2\right)\log\left(c^2x^2+1\right)}{6c}-\frac{1}{3}bcd$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*d^2)/(6*x^2) - (d^2*(a + b*ArcTan[c*x]))/(3*x^3) - (2*d*e*(a + b*ArcT
an[c*x]))/x + e^2*x*(a + b*ArcTan[c*x]) - (b*c*d*(c^2*d - 6*e)*Log[x])/3 +
(b*(c^4*d^2 - 6*c^2*d*e - 3*e^2)*Log[1 + c^2*x^2])/(6*c)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
```

```
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx = -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{2de\left(a+b\tan^{-1}(cx)\right)}{x} + e^2x\left(a+b\tan^{-1}(cx)\right) - ($$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{2de\left(a+b\tan^{-1}(cx)\right)}{x} + e^2x\left(a+b\tan^{-1}(cx)\right) - \frac{1}{3}$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{2de\left(a+b\tan^{-1}(cx)\right)}{x} + e^2x\left(a+b\tan^{-1}(cx)\right) - \frac{1}{6}$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{2de\left(a+b\tan^{-1}(cx)\right)}{x} + e^2x\left(a+b\tan^{-1}(cx)\right) - \frac{1}{6}$$

$$= -\frac{bcd^2}{6x^2} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)}{3x^3} - \frac{2de\left(a+b\tan^{-1}(cx)\right)}{x} + e^2x\left(a+b\tan^{-1}(\right.$$

Mathematica [A] time = 0.12, size = 119, normalized size = 1.03

$$\frac{1}{6}\left(-\frac{2ad^2}{x^3} - \frac{12ade}{x} + 6ae^2x - 2bcd\log(x)\left(c^2d-6e\right) + \frac{b\left(c^4d^2-6c^2de-3e^2\right)\log\left(c^2x^2+1\right)}{c} - \frac{2b\tan^{-1}(cx)\left(d^2\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^2)/x^3 - (b*c*d^2)/x^2 - (12*a*d*e)/x + 6*a*e^2*x - (2*b*(d^2 + 6*
d*e*x^2 - 3*e^2*x^4)*ArcTan[c*x])/x^3 - 2*b*c*d*(c^2*d - 6*e)*Log[x] + (b*(
c^4*d^2 - 6*c^2*d*e - 3*e^2)*Log[1 + c^2*x^2])/c)/6
```

fricas [A] time = 0.43, size = 139, normalized size = 1.21

$$\frac{6\,ace^2x^4 - bc^2d^2x - 12\,acdex^2 + \left(bc^4d^2 - 6\,bc^2de - 3\,be^2\right)x^3\log\left(c^2x^2+1\right) - 2\left(bc^4d^2 - 6\,bc^2de\right)x^3\log(x) - 2\,a}{6\,cx^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/6*(6*a*c*e^2*x^4 - b*c^2*d^2*x - 12*a*c*d*e*x^2 + (b*c^4*d^2 - 6*b*c^2*d*
e - 3*b*e^2)*x^3*log(c^2*x^2 + 1) - 2*(b*c^4*d^2 - 6*b*c^2*d*e)*x^3*log(x)
- 2*a*c*d^2 + 2*(3*b*c*e^2*x^4 - 6*b*c*d*e*x^2 - b*c*d^2)*arctan(c*x))/(c*x
^3)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 147, normalized size = 1.28

$$ax\,e^2-\frac{a\,d^2}{3x^3}-\frac{2aed}{x}+b\arctan(cx)\,x\,e^2-\frac{b\arctan(cx)\,d^2}{3x^3}-\frac{2b\arctan(cx)\,ed}{x}-\frac{c^3b\,d^2\ln(cx)}{3}+2cb\ln(cx)\,de-\frac{bc\,d^2}{6x^2}+\frac{c^3b}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] a*x*e^2-1/3*a*d^2/x^3-2*a*e*d/x+b*arctan(c*x)*x*e^2-1/3*b*arctan(c*x)*d^2/x
^3-2*b*arctan(c*x)*e*d/x-1/3*c^3*b*d^2*ln(c*x)+2*c*b*ln(c*x)*d*e-1/6*b*c*d^
2/x^2+1/6*c^3*b*ln(c^2*x^2+1)*d^2-c*b*ln(c^2*x^2+1)*e*d-1/2/c*b*ln(c^2*x^2+
1)*e^2
```

maxima [A] time = 0.32, size = 135, normalized size = 1.17

$$\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bd^2-\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bd$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b
*d^2 - (c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d*e + a*e^2*x
+ 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*e^2/c - 2*a*d*e/x - 1/3*a*d^
2/x^3
```

mupad [B] time = 0.68, size = 142, normalized size = 1.23

$$a\,e^2\,x-\frac{a\,d^2}{3\,x^3}+\frac{b\,c^3\,d^2\,\ln\left(c^2\,x^2+1\right)}{6}-\frac{b\,e^2\,\ln\left(c^2\,x^2+1\right)}{2\,c}-\frac{b\,c^3\,d^2\,\ln(x)}{3}-\frac{2\,a\,d\,e}{x}+b\,e^2\,x\,\mathrm{atan}\,(c\,x)-\frac{b\,c\,d^2}{6\,x^2}-\frac{b\,d^2\,\mathrm{atan}\,(c}{3\,x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x^4,x)
```

```
[Out] a*e^2*x - (a*d^2)/(3*x^3) + (b*c^3*d^2*log(c^2*x^2 + 1))/6 - (b*e^2*log(c^2
*x^2 + 1))/(2*c) - (b*c^3*d^2*log(x))/3 - (2*a*d*e)/x + b*e^2*x*atan(c*x) -
 (b*c*d^2)/(6*x^2) - (b*d^2*atan(c*x))/(3*x^3) - b*c*d*e*log(c^2*x^2 + 1) +
 2*b*c*d*e*log(x) - (2*b*d*e*atan(c*x))/x
```

sympy [A] time = 1.87, size = 180, normalized size = 1.57

$$\begin{cases}-\frac{ad^2}{3x^3}-\frac{2ade}{x}+ae^2x-\frac{bc^3d^2\log(x)}{3}+\frac{bc^3d^2\log\left(x^2+\frac{1}{c^2}\right)}{6}-\frac{bcd^2}{6x^2}+2bcde\log(x)-bcde\log\left(x^2+\frac{1}{c^2}\right)-\frac{bd^2\operatorname{atan}(cx)}{3x^3}-\frac{2bde\,\mathrm{at}}{x} \\ a\left(-\frac{d^2}{3x^3}-\frac{2de}{x}+e^2x\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Piecewise((-a*d**2/(3*x**3) - 2*a*d*e/x + a*e**2*x - b*c**3*d**2*log(x)/3 +
 b*c**3*d**2*log(x**2 + c**(-2))/6 - b*c*d**2/(6*x**2) + 2*b*c*d*e*log(x) -
 b*c*d*e*log(x**2 + c**(-2)) - b*d**2*atan(c*x)/(3*x**3) - 2*b*d*e*atan(c*x
)/x + b*e**2*x*atan(c*x) - b*e**2*log(x**2 + c**(-2))/(2*c), Ne(c, 0)), (a*
(-d**2/(3*x**3) - 2*d*e/x + e**2*x), True))
```

3.1133 $\int \frac{(d+ex^2)^2(a+b\tan^{-1}(cx))}{x^5}\,dx$

Optimal. Leaf size=139

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{de\left(a+b\tan^{-1}(cx)\right)}{x^2}+ae^2\log(x)+\frac{1}{4}bc^4d^2\tan^{-1}(cx)+\frac{bc^3d^2}{4x}-bc^2de\tan^{-1}(cx)-\frac{bcd^2}{12x^3}-\frac{bcd}{x}$$

```
[Out] -1/12*b*c*d^2/x^3+1/4*b*c^3*d^2/x-b*c*d*e/x+1/4*b*c^4*d^2*arctan(c*x)-b*c^2
*d*e*arctan(c*x)-1/4*d^2*(a+b*arctan(c*x))/x^4-d*e*(a+b*arctan(c*x))/x^2+a*
e^2*ln(x)+1/2*I*b*e^2*polylog(2,-I*c*x)-1/2*I*b*e^2*polylog(2,I*c*x)
```

Rubi [A] time = 0.17, antiderivative size = 139, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4980, 4852, 325, 203, 4848, 2391}

$$\frac{1}{2}ibe^2\text{PolyLog}(2,-icx)-\frac{1}{2}ibe^2\text{PolyLog}(2,icx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{de\left(a+b\tan^{-1}(cx)\right)}{x^2}+ae^2\log(x)+\frac{bc^3d^2}{4x}+$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(b*c*d^2)/(12*x^3) + (b*c^3*d^2)/(4*x) - (b*c*d*e)/x + (b*c^4*d^2*ArcTan[c
*x])/4 - b*c^2*d*e*ArcTan[c*x] - (d^2*(a + b*ArcTan[c*x]))/(4*x^4) - (d*e*(
a + b*ArcTan[c*x]))/x^2 + a*e^2*Log[x] + (I/2)*b*e^2*PolyLog[2, (-I)*c*x] -
 (I/2)*b*e^2*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx = \int \left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{x^5}+\frac{2de\left(a+b\tan^{-1}(cx)\right)}{x^3}+\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{x}\right) dx$$

$$= d^2\int \frac{a+b\tan^{-1}(cx)}{x^5}\,dx+(2de)\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx+e^2\int \frac{a+b\tan^{-1}(c$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{de\left(a+b\tan^{-1}(cx)\right)}{x^2}+ae^2\log(x)+\frac{1}{4}\left(bcd^2\right)\int \frac{}{x^4(}$$

$$= -\frac{bcd^2}{12x^3}-\frac{bcde}{x}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{de\left(a+b\tan^{-1}(cx)\right)}{x^2}+ae^2\log(x)+$$

$$= -\frac{bcd^2}{12x^3}+\frac{bc^3d^2}{4x}-\frac{bcde}{x}-bc^2de\tan^{-1}(cx)-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{de\left(a+b\right.}{}$$

$$= -\frac{bcd^2}{12x^3}+\frac{bc^3d^2}{4x}-\frac{bcde}{x}+\frac{1}{4}bc^4d^2\tan^{-1}(cx)-bc^2de\tan^{-1}(cx)-\frac{d^2\left(a+b\tan\right.}{4x^4}$$

Mathematica [C] time = 0.11, size = 130, normalized size = 0.94

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{de\left(a+b\tan^{-1}(cx)\right)}{x^2}+ae^2\log(x)-\frac{bcd^2\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right)}{12x^3}-\frac{bcde\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)}{x}+$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -1/4*(d^2*(a + b*ArcTan[c*x]))/x^4 - (d*e*(a + b*ArcTan[c*x]))/x^2 - (b*c*d
^2*Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)])/(12*x^3) - (b*c*d*e*Hyperg
eometric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/x + a*e^2*Log[x] + (I/2)*b*e^2*PolyL
og[2, (-I)*c*x] - (I/2)*b*e^2*PolyLog[2, I*c*x]
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\arctan(cx)}{x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))/x^5, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 190, normalized size = 1.37

$$a\,e^2\ln(cx)-\frac{a\,d^2}{4x^4}-\frac{aed}{x^2}+b\arctan(cx)\,e^2\ln(cx)-\frac{b\arctan(cx)\,d^2}{4x^4}-\frac{b\arctan(cx)\,ed}{x^2}+\frac{ib\,e^2\ln(cx)\ln(icx+1)}{2}-\frac{ib\,e}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] a*e^2*ln(c*x)-1/4*a*d^2/x^4-a*e*d/x^2+b*arctan(c*x)*e^2*ln(c*x)-1/4*b*arcta
n(c*x)*d^2/x^4-b*arctan(c*x)*e*d/x^2+1/2*I*b*e^2*ln(c*x)*ln(1+I*c*x)-1/2*I*
b*e^2*ln(c*x)*ln(1-I*c*x)+1/2*I*b*e^2*dilog(1+I*c*x)-1/2*I*b*e^2*dilog(1-I*
c*x)+1/4*b*c^3*d^2/x-b*c*d*e/x-1/12*b*c*d^2/x^3+1/4*b*c^4*d^2*arctan(c*x)-b
*c^2*d*e*arctan(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{12}\left(\left(3\,c^3\arctan(cx)+\frac{3\,c^2x^2-1}{x^3}\right)c-\frac{3\,\arctan(cx)}{x^4}\right)bd^2-\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bde+be^2\int\frac{\mathrm{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] 1/12*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*d^
2 - ((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d*e + b*e^2*integrate(arc
tan(c*x)/x, x) + a*e^2*log(x) - a*d*e/x^2 - 1/4*a*d^2/x^4
```

mupad [B] time = 0.76, size = 177, normalized size = 1.27

$$\begin{cases} a\,e^2\,\ln(x)-\frac{\frac{a\,d^2}{4}+a\,e\,d\,x^2}{x^4} & \\ a\,e^2\,\ln(x)-\frac{\frac{a\,d^2}{4}+a\,e\,d\,x^2}{x^4}-\frac{b\,d^2\left(\frac{\frac{c^2}{3}-c^4\,x^2}{x^3}-c^5\,\mathrm{atan}(c\,x)\right)}{4\,c}-2\,b\,d\,e\left(\frac{c^3\,\mathrm{atan}(c\,x)+\frac{c^2}{x}}{2\,c}+\frac{\mathrm{atan}(c\,x)}{2\,x^2}\right)-\frac{b\,d^2\,\mathrm{atan}(c\,x)}{4\,x^4}-\frac{b\,e^2\,\mathrm{Li}_2(1-c\,x\,1\mathrm{i})}{2} & \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x^5,x)
```

```
[Out] piecewise(c == 0, - ((a*d^2)/4 + a*d*e*x^2)/x^4 + a*e^2*log(x), c ~= 0, - (
(a*d^2)/4 + a*d*e*x^2)/x^4 + a*e^2*log(x) - (b*e^2*dilog(- c*x*1i + 1)*1i)/
2 + (b*e^2*dilog(c*x*1i + 1)*1i)/2 - (b*d^2*((c^2/3 - c^4*x^2)/x^3 - c^5*at
an(c*x)))/(4*c) - 2*b*d*e*((c^3*atan(c*x) + c^2/x)/(2*c) + atan(c*x)/(2*x^2
)) - (b*d^2*atan(c*x))/(4*x^4))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{(a+b\,\mathrm{atan}(cx))\left(d+ex^2\right)^2}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x**5,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**2/x**5, x)
```

3.1134 $\int \frac{(d+ex^2)^2(a+b\tan^{-1}(cx))}{x^6}\,dx$

Optimal. Leaf size=150

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{bcd\left(3c^2d-10e\right)}{30x^2}-\frac{1}{30}bc\left(3c^4d^2-10c^2de+15\right.$$

```
[Out] -1/20*b*c*d^2/x^4+1/30*b*c*d*(3*c^2*d-10*e)/x^2-1/5*d^2*(a+b*arctan(c*x))/x
^5-2/3*d*e*(a+b*arctan(c*x))/x^3-e^2*(a+b*arctan(c*x))/x+1/15*b*c*(3*c^4*d^
2-10*c^2*d*e+15*e^2)*ln(x)-1/30*b*c*(3*c^4*d^2-10*c^2*d*e+15*e^2)*ln(c^2*x^
2+1)
```

Rubi [A] time = 0.19, antiderivative size = 150, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {270, 4976, 12, 1251, 893}

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{30}bc\left(3c^4d^2-10c^2de+15e^2\right)\log\left(c^2x^2+1\right)+$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -(b*c*d^2)/(20*x^4) + (b*c*d*(3*c^2*d - 10*e))/(30*x^2) - (d^2*(a + b*ArcTa
n[c*x]))/(5*x^5) - (2*d*e*(a + b*ArcTan[c*x]))/(3*x^3) - (e^2*(a + b*ArcTan
[c*x]))/x + (b*c*(3*c^4*d^2 - 10*c^2*d*e + 15*e^2)*Log[x])/15 - (b*c*(3*c^4
*d^2 - 10*c^2*d*e + 15*e^2)*Log[1 + c^2*x^2])/30
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
```

```
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] && !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] && !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] && !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx = -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{x}-(b$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{15}$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{3}$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{3}$$

$$= -\frac{bcd^2}{20x^4}+\frac{bcd\left(3c^2d-10e\right)}{30x^2}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{3x^3}$$

Mathematica [A] time = 0.16, size = 149, normalized size = 0.99

$$\frac{1}{60}\left(-\frac{12d^2\left(a+b\tan^{-1}(cx)\right)}{x^5}-\frac{40de\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{60e^2\left(a+b\tan^{-1}(cx)\right)}{x}-20bcde\left(-c^2\log\left(c^2x^2+1\right)+\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] ((-12*d^2*(a + b*ArcTan[c*x]))/x^5 - (40*d*e*(a + b*ArcTan[c*x]))/x^3 - (60
*e^2*(a + b*ArcTan[c*x]))/x + 30*b*c*e^2*(2*Log[x] - Log[1 + c^2*x^2]) - 20
*b*c*d*e*(x^(-2) + 2*c^2*Log[x] - c^2*Log[1 + c^2*x^2]) - 3*b*c*d^2*(x^(-4)
 - (2*c^2)/x^2 - 4*c^4*Log[x] + 2*c^4*Log[1 + c^2*x^2]))/60
```

fricas [A] time = 0.50, size = 160, normalized size = 1.07

$$-\frac{60\,ae^2x^4+2\left(3\,bc^5d^2-10\,bc^3de+15\,bce^2\right)x^5\log\left(c^2x^2+1\right)-4\left(3\,bc^5d^2-10\,bc^3de+15\,bce^2\right)x^5\log(x)+3\,bc}{60\,x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] -1/60*(60*a*e^2*x^4 + 2*(3*b*c^5*d^2 - 10*b*c^3*d*e + 15*b*c*e^2)*x^5*log(c
^2*x^2 + 1) - 4*(3*b*c^5*d^2 - 10*b*c^3*d*e + 15*b*c*e^2)*x^5*log(x) + 3*b*
c*d^2*x + 40*a*d*e*x^2 - 2*(3*b*c^3*d^2 - 10*b*c*d*e)*x^3 + 12*a*d^2 + 4*(1
5*b*e^2*x^4 + 10*b*d*e*x^2 + 3*b*d^2)*arctan(c*x))/x^5
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 186, normalized size = 1.24

$$-\frac{2aed}{3x^3}-\frac{a\,e^2}{x}-\frac{a\,d^2}{5x^5}-\frac{2b\arctan(cx)\,ed}{3x^3}-\frac{b\arctan(cx)\,e^2}{x}-\frac{b\arctan(cx)\,d^2}{5x^5}+\frac{c^5b\,d^2\ln(cx)}{5}-\frac{2c^3b\ln(cx)\,de}{3}+cb\ln(cx)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x^6,x)
```

```
[Out] -2/3*a*e*d/x^3-a*e^2/x-1/5*a*d^2/x^5-2/3*b*arctan(c*x)*e*d/x^3-b*arctan(c*x
)*e^2/x-1/5*b*arctan(c*x)*d^2/x^5+1/5*c^5*b*d^2*ln(c*x)-2/3*c^3*b*ln(c*x)*d
*e+c*b*ln(c*x)*e^2+1/10*b*c^3*d^2/x^2-1/3*c*b*e*d/x^2-1/20*b*c*d^2/x^4-1/10
*c^5*b*ln(c^2*x^2+1)*d^2+1/3*c^3*b*ln(c^2*x^2+1)*e*d-1/2*c*b*ln(c^2*x^2+1)*
e^2
```

maxima [A] time = 0.32, size = 166, normalized size = 1.11

$$-\frac{1}{20}\left(\left(2\,c^4\log\left(c^2x^2+1\right)-2\,c^4\log\left(x^2\right)-\frac{2\,c^2x^2-1}{x^4}\right)c+\frac{4\arctan(cx)}{x^5}\right)bd^2+\frac{1}{3}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*c +
4*arctan(c*x)/x^5)*b*d^2 + 1/3*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^
2)*c - 2*arctan(c*x)/x^3)*b*d*e - 1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*
arctan(c*x)/x)*b*e^2 - a*e^2/x - 2/3*a*d*e/x^3 - 1/5*a*d^2/x^5
```

mupad [B] time = 0.49, size = 179, normalized size = 1.19

$$\frac{b\,c^3\,d^2}{10\,x^2}-\frac{a\,e^2}{x}-\frac{b\,c^5\,d^2\,\ln\left(c^2\,x^2+1\right)}{10}-\frac{a\,d^2}{5\,x^5}+\frac{b\,c^5\,d^2\,\ln(x)}{5}-\frac{2\,a\,d\,e}{3\,x^3}-\frac{b\,c\,e^2\,\ln\left(c^2\,x^2+1\right)}{2}-\frac{b\,c\,d^2}{20\,x^4}+b\,c\,e^2\,\ln(x)-\frac{b\,d^2\,\mathrm{ata}}{5\,x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x^6,x)
```

```
[Out] (b*c^3*d^2)/(10*x^2) - (a*e^2)/x - (b*c^5*d^2*log(c^2*x^2 + 1))/10 - (a*d^2
)/(5*x^5) + (b*c^5*d^2*log(x))/5 - (2*a*d*e)/(3*x^3) - (b*c*e^2*log(c^2*x^2
 + 1))/2 - (b*c*d^2)/(20*x^4) + b*c*e^2*log(x) - (b*d^2*atan(c*x))/(5*x^5)
- (b*e^2*atan(c*x))/x + (b*c^3*d*e*log(c^2*x^2 + 1))/3 - (2*b*c^3*d*e*log(x
))/3 - (b*c*d*e)/(3*x^2) - (2*b*d*e*atan(c*x))/(3*x^3)
```

sympy [A] time = 2.52, size = 235, normalized size = 1.57

$$\begin{cases} -\frac{ad^2}{5x^5}-\frac{2ade}{3x^3}-\frac{ae^2}{x}+\frac{bc^5d^2\log(x)}{5}-\frac{bc^5d^2\log\left(x^2+\frac{1}{c^2}\right)}{10}+\frac{bc^3d^2}{10x^2}-\frac{2bc^3de\log(x)}{3}+\frac{bc^3de\log\left(x^2+\frac{1}{c^2}\right)}{3}-\frac{bcd^2}{20x^4}-\frac{bcde}{3x^2}+bce^2\log(x) \\ a\left(-\frac{d^2}{5x^5}-\frac{2de}{3x^3}-\frac{e^2}{x}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x**6,x)
```

```
[Out] Piecewise((-a*d**2/(5*x**5) - 2*a*d*e/(3*x**3) - a*e**2/x + b*c**5*d**2*log
(x)/5 - b*c**5*d**2*log(x**2 + c**(-2))/10 + b*c**3*d**2/(10*x**2) - 2*b*c*
*3*d*e*log(x)/3 + b*c**3*d*e*log(x**2 + c**(-2))/3 - b*c*d**2/(20*x**4) - b
*c*d*e/(3*x**2) + b*c*e**2*log(x) - b*c*e**2*log(x**2 + c**(-2))/2 - b*d**2
*atan(c*x)/(5*x**5) - 2*b*d*e*atan(c*x)/(3*x**3) - b*e**2*atan(c*x)/x, Ne(c
, 0)), (a*(-d**2/(5*x**5) - 2*d*e/(3*x**3) - e**2/x), True))
```

3.1135 $\int \frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{x^7}\,dx$

Optimal. Leaf size=111

$$-\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6dx^6}+\frac{bcd\left(c^2d-3e\right)}{18x^3}-\frac{b\left(c^2d-e\right)^3\tan^{-1}(cx)}{6d}-\frac{bc\left(c^4d^2-3c^2de+3e^2\right)}{6x}-\frac{bcd^2}{30x^5}$$

```
[Out] -1/30*b*c*d^2/x^5+1/18*b*c*d*(c^2*d-3*e)/x^3-1/6*b*c*(c^4*d^2-3*c^2*d*e+3*e
^2)/x-1/6*b*(c^2*d-e)^3*arctan(c*x)/d-1/6*(e*x^2+d)^3*(a+b*arctan(c*x))/d/x
^6
```

Rubi [A] time = 0.15, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {264, 4976, 12, 461, 203}

$$-\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6dx^6}-\frac{bc\left(c^4d^2-3c^2de+3e^2\right)}{6x}+\frac{bcd\left(c^2d-3e\right)}{18x^3}-\frac{b\left(c^2d-e\right)^3\tan^{-1}(cx)}{6d}-\frac{bcd^2}{30x^5}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -(b*c*d^2)/(30*x^5) + (b*c*d*(c^2*d - 3*e))/(18*x^3) - (b*c*(c^4*d^2 - 3*c^
2*d*e + 3*e^2))/(6*x) - (b*(c^2*d - e)^3*ArcTan[c*x])/(6*d) - ((d + e*x^2)^
3*(a + b*ArcTan[c*x]))/(6*d*x^6)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 461

```
Int[(((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_))/((c_) + (d_.)*(x_)^(
n_)), x_Symbol] :> Int[ExpandIntegrand[((e*x)^m*(a + b*x^n)^p)/(c + d*x^n),
 x], x] /; FreeQ[{a, b, c, d, e, m}, x] && NeQ[b*c - a*d, 0] && IGtQ[n, 0]
&& IGtQ[p, 0] && (IntegerQ[m] || IGtQ[2*(m + 1), 0] ||  !RationalQ[m])
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
```

```
- 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)}{x^7}\,dx = -\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6dx^6}-(bc)\int \frac{\left(d+ex^2\right)^3}{6x^6\left(-d-c^2dx^2\right)}\,dx$$
$$= -\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6dx^6}-\frac{1}{6}(bc)\int \frac{\left(d+ex^2\right)^3}{x^6\left(-d-c^2dx^2\right)}\,dx$$
$$= -\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{6dx^6}-\frac{1}{6}(bc)\int \left(-\frac{d^2}{x^6}+\frac{d\left(c^2d-3e\right)}{x^4}+\frac{-c^4d^2+3c}{x^2}\right.$$
$$= -\frac{bcd^2}{30x^5}+\frac{bcd\left(c^2d-3e\right)}{18x^3}-\frac{bc\left(c^4d^2-3c^2de+3e^2\right)}{6x}-\frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}\right.}{6dx^6}$$
$$= -\frac{bcd^2}{30x^5}+\frac{bcd\left(c^2d-3e\right)}{18x^3}-\frac{bc\left(c^4d^2-3c^2de+3e^2\right)}{6x}-\frac{b\left(c^2d-e\right)^3\tan^{-1}(cx)}{6d}$$

Mathematica [C] time = 0.11, size = 112, normalized size = 1.01

$$-\frac{5\left(\left(d^2+3dex^2+3e^2x^4\right)\left(a+b\tan^{-1}(cx)\right)+bcdex^3\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right)+3bce^2x^5\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)\right)+bcd}{30x^6}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -1/30*(b*c*d^2*x*Hypergeometric2F1[-5/2, 1, -3/2, -(c^2*x^2)] + 5*((d^2 + 3
*d*e*x^2 + 3*e^2*x^4)*(a + b*ArcTan[c*x]) + b*c*d*e*x^3*Hypergeometric2F1[-
3/2, 1, -1/2, -(c^2*x^2)] + 3*b*c*e^2*x^5*Hypergeometric2F1[-1/2, 1, 1/2, -
(c^2*x^2)]))/x^6
```

fricas [A] time = 0.45, size = 145, normalized size = 1.31

$$-\frac{45\,ae^2x^4+15\left(bc^5d^2-3\,bc^3de+3\,bce^2\right)x^5+3\,bcd^2x+45\,adex^2-5\left(bc^3d^2-3\,bcde\right)x^3+15\,ad^2+15\left(3\,be^2x^4+\right.}{90\,x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^7,x, algorithm="fricas")
```

```
[Out] -1/90*(45*a*e^2*x^4 + 15*(b*c^5*d^2 - 3*b*c^3*d*e + 3*b*c*e^2)*x^5 + 3*b*c*
d^2*x + 45*a*d*e*x^2 - 5*(b*c^3*d^2 - 3*b*c*d*e)*x^3 + 15*a*d^2 + 15*(3*b*e
^2*x^4 + (b*c^6*d^2 - 3*b*c^4*d*e + 3*b*c^2*e^2)*x^6 + 3*b*d*e*x^2 + b*d^2)
*arctan(c*x))/x^6
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^7,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 168, normalized size = 1.51

$$-\frac{aed}{2x^4}-\frac{a\,d^2}{6x^6}-\frac{a\,e^2}{2x^2}-\frac{b\arctan(cx)\,ed}{2x^4}-\frac{b\arctan(cx)\,d^2}{6x^6}-\frac{b\arctan(cx)\,e^2}{2x^2}-\frac{c^5b\,d^2}{6x}+\frac{c^3bed}{2x}-\frac{cb\,e^2}{2x}+\frac{c^3b\,d^2}{18x^3}-\frac{cbed}{6x^3}-\frac{bc}{30}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x^7,x)
```

```
[Out] -1/2*a*e*d/x^4-1/6*a*d^2/x^6-1/2*a*e^2/x^2-1/2*b*arctan(c*x)*e*d/x^4-1/6*b*
arctan(c*x)*d^2/x^6-1/2*b*arctan(c*x)*e^2/x^2-1/6*c^5*b*d^2/x+1/2*c^3*b*e*d
/x-1/2*c*b*e^2/x+1/18*c^3*b*d^2/x^3-1/6*c*b*e*d/x^3-1/30*b*c*d^2/x^5-1/6*c^
6*b*arctan(c*x)*d^2+1/2*c^4*b*arctan(c*x)*e*d-1/2*c^2*b*arctan(c*x)*e^2
```

maxima [A] time = 0.42, size = 145, normalized size = 1.31

$$-\frac{1}{90}\left(\left(15\,c^5\arctan(cx)+\frac{15\,c^4x^4-5\,c^2x^2+3}{x^5}\right)c+\frac{15\,\arctan(cx)}{x^6}\right)bd^2+\frac{1}{6}\left(\left(3\,c^3\arctan(cx)+\frac{3\,c^2x^2-1}{x^3}\right)c-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^7,x, algorithm="maxima")
```

```
[Out] -1/90*((15*c^5*arctan(c*x) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arcta
n(c*x)/x^6)*b*d^2 + 1/6*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*ar
ctan(c*x)/x^4)*b*d*e - 1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*e^
2 - 1/2*a*e^2/x^2 - 1/2*a*d*e/x^4 - 1/6*a*d^2/x^6
```

mupad [B] time = 0.81, size = 256, normalized size = 2.31

$$-\frac{\frac{a\,d^2}{6}+\frac{b\,d^2\,\mathrm{atan}(c\,x)}{6}-\frac{a\,c^4\,e^2\,x^8}{2}+\frac{a\,e\,x^4\,(d\,c^2+e)}{2}+\frac{b\,c\,x^5\,(2\,c^4\,d^2-6\,c^2\,d\,e+9\,e^2)}{18}+\frac{b\,c\,d^2\,x}{30}+\frac{a\,d\,x^2\,(d\,c^2+3\,e)}{6}+\frac{b\,c^3\,x^7\,(c^4\,d^2-3\,c^2\,d\,e+3}{6}}{c^2\,x^8+x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x^7,x)
```

```
[Out] - ((a*d^2)/6 + (b*d^2*atan(c*x))/6 - (a*c^4*e^2*x^8)/2 + (a*e*x^4*(e + c^2*
d))/2 + (b*c*x^5*(9*e^2 + 2*c^4*d^2 - 6*c^2*d*e))/18 + (b*c*d^2*x)/30 + (a*
d*x^2*(3*e + c^2*d))/6 + (b*c^3*x^7*(3*e^2 + c^4*d^2 - 3*c^2*d*e))/6 + (b*c
*d*x^3*(15*e - 2*c^2*d))/90 + (b*d*x^2*atan(c*x)*(3*e + c^2*d))/6 + (b*c^2*
e^2*x^6*atan(c*x))/2 + (b*e*x^4*atan(c*x)*(e + c^2*d))/2)/(x^6 + c^2*x^8) -
 (atan((c^2*x)/(c^2)^(1/2))*(c^2)^(5/2)*(3*b*e^2 + b*c^4*d^2 - 3*b*c^2*d*e)
)/(6*c^3)
```

sympy [A] time = 1.87, size = 192, normalized size = 1.73

$$-\frac{ad^2}{6x^6}-\frac{ade}{2x^4}-\frac{ae^2}{2x^2}-\frac{bc^6d^2\,\mathrm{atan}(cx)}{6}-\frac{bc^5d^2}{6x}+\frac{bc^4de\,\mathrm{atan}(cx)}{2}+\frac{bc^3d^2}{18x^3}+\frac{bc^3de}{2x}-\frac{bc^2e^2\,\mathrm{atan}(cx)}{2}-\frac{bcd^2}{30x^5}-\frac{bcde}{6x^3}-\frac{bce^2}{2x}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x**7,x)
```

```
[Out] -a*d**2/(6*x**6) - a*d*e/(2*x**4) - a*e**2/(2*x**2) - b*c**6*d**2*atan(c*x)
/6 - b*c**5*d**2/(6*x) + b*c**4*d*e*atan(c*x)/2 + b*c**3*d**2/(18*x**3) + b
*c**3*d*e/(2*x) - b*c**2*e**2*atan(c*x)/2 - b*c*d**2/(30*x**5) - b*c*d*e/(6
*x**3) - b*c*e**2/(2*x) - b*d**2*atan(c*x)/(6*x**6) - b*d*e*atan(c*x)/(2*x*
*4) - b*e**2*atan(c*x)/(2*x**2)
```

3.1136 $\int \frac{(d+ex^2)^2 (a+b\tan^{-1}(cx))}{x^8} \, dx$

Optimal. Leaf size=186

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{7x^7}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}+\frac{bcd\left(5c^2d-14e\right)}{140x^4}-\frac{bc\left(15c^4d^2-42c^2de+35e^2\right.}{210x^2}$$

```
[Out] -1/42*b*c*d^2/x^6+1/140*b*c*d*(5*c^2*d-14*e)/x^4-1/210*b*c*(15*c^4*d^2-42*c
^2*d*e+35*e^2)/x^2-1/7*d^2*(a+b*arctan(c*x))/x^7-2/5*d*e*(a+b*arctan(c*x))/
x^5-1/3*e^2*(a+b*arctan(c*x))/x^3-1/105*b*c^3*(15*c^4*d^2-42*c^2*d*e+35*e^2
)*ln(x)+1/210*b*c^3*(15*c^4*d^2-42*c^2*d*e+35*e^2)*ln(c^2*x^2+1)
```

Rubi [A] time = 0.23, antiderivative size = 186, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {270, 4976, 12, 1251, 893}

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{7x^7}-\frac{2de\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{e^2\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{bc\left(15c^4d^2-42c^2de+35e^2\right)}{210x^2}+\frac{1}{210}bc^3\left(15c^4d^2\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^8,x]
```

```
[Out] -(b*c*d^2)/(42*x^6) + (b*c*d*(5*c^2*d - 14*e))/(140*x^4) - (b*c*(15*c^4*d^2
 - 42*c^2*d*e + 35*e^2))/(210*x^2) - (d^2*(a + b*ArcTan[c*x]))/(7*x^7) - (2
*d*e*(a + b*ArcTan[c*x]))/(5*x^5) - (e^2*(a + b*ArcTan[c*x]))/(3*x^3) - (b*
c^3*(15*c^4*d^2 - 42*c^2*d*e + 35*e^2)*Log[x])/105 + (b*c^3*(15*c^4*d^2 - 4
2*c^2*d*e + 35*e^2)*Log[1 + c^2*x^2])/210
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 893

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(d + e*x)^m*(f + g
*x)^n*(a + b*x + c*x^2)^p, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ
[e*f - d*g, 0] && NeQ[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && I
ntegerQ[p] && ((EqQ[p, 1] && IntegersQ[m, n]) || (ILtQ[m, 0] && ILtQ[n, 0])
)
```

Rule 1251

```
Int[(x_)^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (c_.)*(x_
)^4)^(p_.), x_Symbol] :> Dist[1/2, Subst[Int[x^((m - 1)/2)*(d + e*x)^q*(a +
 b*x + c*x^2)^p, x], x, x^2], x] /; FreeQ[{a, b, c, d, e, p, q}, x] && Inte
gerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
```

```
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] && !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] && !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] && !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)^2 (a+b\tan^{-1}(cx))}{x^8}\,dx = -\frac{d^2(a+b\tan^{-1}(cx))}{7x^7} - \frac{2de(a+b\tan^{-1}(cx))}{5x^5} - \frac{e^2(a+b\tan^{-1}(cx))}{3x^3} - (b$$

$$= -\frac{d^2(a+b\tan^{-1}(cx))}{7x^7} - \frac{2de(a+b\tan^{-1}(cx))}{5x^5} - \frac{e^2(a+b\tan^{-1}(cx))}{3x^3} - \frac{}{10}$$

$$= -\frac{d^2(a+b\tan^{-1}(cx))}{7x^7} - \frac{2de(a+b\tan^{-1}(cx))}{5x^5} - \frac{e^2(a+b\tan^{-1}(cx))}{3x^3} - \frac{}{2}$$

$$= -\frac{d^2(a+b\tan^{-1}(cx))}{7x^7} - \frac{2de(a+b\tan^{-1}(cx))}{5x^5} - \frac{e^2(a+b\tan^{-1}(cx))}{3x^3} - \frac{}{2}$$

$$= -\frac{bcd^2}{42x^6} + \frac{bcd(5c^2d-14e)}{140x^4} - \frac{bc(15c^4d^2-42c^2de+35e^2)}{210x^2} - \frac{d^2(a+b\tan}{7x^7}$$

Mathematica [A] time = 0.23, size = 177, normalized size = 0.95

$$\frac{1}{420}\left(-\frac{60d^2(a+b\tan^{-1}(cx))}{x^7} - \frac{168de(a+b\tan^{-1}(cx))}{x^5} - \frac{140e^2(a+b\tan^{-1}(cx))}{x^3} - 70bce^2\left(-c^2\log(c^2x^2+1\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x]))/x^8,x]
```

```
[Out] ((-60*d^2*(a + b*ArcTan[c*x]))/x^7 - (168*d*e*(a + b*ArcTan[c*x]))/x^5 - (1
40*e^2*(a + b*ArcTan[c*x]))/x^3 - 70*b*c*e^2*(x^(-2) + 2*c^2*Log[x] - c^2*L
og[1 + c^2*x^2]) - 42*b*c*d*e*(x^(-4) - (2*c^2)/x^2 - 4*c^4*Log[x] + 2*c^4*
Log[1 + c^2*x^2]) - 5*b*c*d^2*((2 - 3*c^2*x^2 + 6*c^4*x^4)/x^6 + 12*c^6*Log
[x] - 6*c^6*Log[1 + c^2*x^2]))/420
```

fricas [A] time = 0.45, size = 194, normalized size = 1.04

$$\frac{2\left(15\,bc^7d^2 - 42\,bc^5de + 35\,bc^3e^2\right)x^7\log\left(c^2x^2+1\right) - 4\left(15\,bc^7d^2 - 42\,bc^5de + 35\,bc^3e^2\right)x^7\log(x) - 140\,ae^2x^4 -}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] 1/420*(2*(15*b*c^7*d^2 - 42*b*c^5*d*e + 35*b*c^3*e^2)*x^7*log(c^2*x^2 + 1)
- 4*(15*b*c^7*d^2 - 42*b*c^5*d*e + 35*b*c^3*e^2)*x^7*log(x) - 140*a*e^2*x^4
 - 2*(15*b*c^5*d^2 - 42*b*c^3*d*e + 35*b*c*e^2)*x^5 - 10*b*c*d^2*x - 168*a*
d*e*x^2 + 3*(5*b*c^3*d^2 - 14*b*c*d*e)*x^3 - 60*a*d^2 - 4*(35*b*e^2*x^4 + 4
2*b*d*e*x^2 + 15*b*d^2)*arctan(c*x))/x^7
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 224, normalized size = 1.20

$$-\frac{a\,d^2}{7x^7}-\frac{a\,e^2}{3x^3}-\frac{2aed}{5x^5}-\frac{b\arctan(cx)\,d^2}{7x^7}-\frac{b\arctan(cx)\,e^2}{3x^3}-\frac{2b\arctan(cx)\,ed}{5x^5}-\frac{c^5b\,d^2}{14x^2}+\frac{c^3bed}{5x^2}-\frac{cb\,e^2}{6x^2}-\frac{c^7b\,d^2\ln(cx)}{7}+\frac{2c^5}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))/x^8,x)
```

```
[Out] -1/7*a*d^2/x^7-1/3*a*e^2/x^3-2/5*a*e*d/x^5-1/7*b*arctan(c*x)*d^2/x^7-1/3*b*
arctan(c*x)*e^2/x^3-2/5*b*arctan(c*x)*e*d/x^5-1/14*c^5*b*d^2/x^2+1/5*c^3*b*
e*d/x^2-1/6*c*b*e^2/x^2-1/7*c^7*b*d^2*ln(c*x)+2/5*c^5*b*ln(c*x)*d*e-1/3*c^3
*b*ln(c*x)*e^2-1/42*b*c*d^2/x^6+1/28*c^3*b*d^2/x^4-1/10*c*b*e*d/x^4+1/14*c^
7*b*ln(c^2*x^2+1)*d^2-1/5*c^5*b*ln(c^2*x^2+1)*e*d+1/6*c^3*b*ln(c^2*x^2+1)*e
^2
```

maxima [A] time = 0.32, size = 197, normalized size = 1.06

$$\frac{1}{84}\left(\left(6\,c^6\log\left(c^2x^2+1\right)-6\,c^6\log\left(x^2\right)-\frac{6\,c^4x^4-3\,c^2x^2+2}{x^6}\right)c-\frac{12\,\arctan(cx)}{x^7}\right)bd^2-\frac{1}{10}\left(\left(2\,c^4\log\left(c^2x^2+1\right)-2\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] 1/84*((6*c^6*log(c^2*x^2 + 1) - 6*c^6*log(x^2) - (6*c^4*x^4 - 3*c^2*x^2 + 2
)/x^6)*c - 12*arctan(c*x)/x^7)*b*d^2 - 1/10*((2*c^4*log(c^2*x^2 + 1) - 2*c^
4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*c + 4*arctan(c*x)/x^5)*b*d*e + 1/6*((c^2*
log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*e^2 - 1/3
*a*e^2/x^3 - 2/5*a*d*e/x^5 - 1/7*a*d^2/x^7
```

mupad [B] time = 0.63, size = 232, normalized size = 1.25

$$-\frac{60\,a\,d^2+60\,b\,d^2\,\mathrm{atan}\left(c\,x\right)+140\,a\,e^2\,x^4-15\,b\,c^3\,d^2\,x^3+30\,b\,c^5\,d^2\,x^5+10\,b\,c\,d^2\,x+168\,a\,d\,e\,x^2+70\,b\,c\,e^2\,x^5+1}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^2)/x^8,x)
```

```
[Out] -(60*a*d^2 + 60*b*d^2*atan(c*x) + 140*a*e^2*x^4 - 15*b*c^3*d^2*x^3 + 30*b*c
^5*d^2*x^5 + 10*b*c*d^2*x + 168*a*d*e*x^2 + 70*b*c*e^2*x^5 + 140*b*e^2*x^4*
atan(c*x) + 60*b*c^7*d^2*x^7*log(x) + 140*b*c^3*e^2*x^7*log(x) - 84*b*c^3*d
*e*x^5 + 42*b*c*d*e*x^3 - 30*b*c^7*d^2*x^7*log(c^2*x^2 + 1) - 70*b*c^3*e^2*
x^7*log(c^2*x^2 + 1) + 168*b*d*e*x^2*atan(c*x) - 168*b*c^5*d*e*x^7*log(x) +
 84*b*c^5*d*e*x^7*log(c^2*x^2 + 1))/(420*x^7)
```

sympy [A] time = 3.98, size = 289, normalized size = 1.55

$$\begin{cases}-\frac{ad^2}{7x^7}-\frac{2ade}{5x^5}-\frac{ae^2}{3x^3}-\frac{bc^7d^2\log(x)}{7}+\frac{bc^7d^2\log\left(x^2+\frac{1}{c^2}\right)}{14}-\frac{bc^5d^2}{14x^2}+\frac{2bc^5de\log(x)}{5}-\frac{bc^5de\log\left(x^2+\frac{1}{c^2}\right)}{5}+\frac{bc^3d^2}{28x^4}+\frac{bc^3de}{5x^2}-\frac{bc^3e^2\log(x)}{3} \\ a\left(-\frac{d^2}{7x^7}-\frac{2de}{5x^5}-\frac{e^2}{3x^3}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))/x**8,x)
```

```
[Out] Piecewise((-a*d**2/(7*x**7) - 2*a*d*e/(5*x**5) - a*e**2/(3*x**3) - b*c**7*d
**2*log(x)/7 + b*c**7*d**2*log(x**2 + c**(-2))/14 - b*c**5*d**2/(14*x**2) +
 2*b*c**5*d*e*log(x)/5 - b*c**5*d*e*log(x**2 + c**(-2))/5 + b*c**3*d**2/(28
*x**4) + b*c**3*d*e/(5*x**2) - b*c**3*e**2*log(x)/3 + b*c**3*e**2*log(x**2
+ c**(-2))/6 - b*c*d**2/(42*x**6) - b*c*d*e/(10*x**4) - b*c*e**2/(6*x**2) -
 b*d**2*atan(c*x)/(7*x**7) - 2*b*d*e*atan(c*x)/(5*x**5) - b*e**2*atan(c*x)/
(3*x**3), Ne(c, 0)), (a*(-d**2/(7*x**7) - 2*d*e/(5*x**5) - e**2/(3*x**3)),
True))
```

3.1137 $\int x^3 \left(d+ex^2\right)^3 \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=240

$$\frac{\left(d+ex^2\right)^5 \left(a+b\tan^{-1}(cx)\right)}{10e^2}-\frac{d\left(d+ex^2\right)^4 \left(a+b\tan^{-1}(cx)\right)}{8e^2}+\frac{b\left(c^2d-e\right)^4 \left(c^2d+4e\right)\tan^{-1}(cx)}{40c^{10}e^2}-\frac{be^2x^7\left(15c^2d-4e\right.}{280c^3}$$

```
[Out] 1/40*b*(10*c^6*d^3-20*c^4*d^2*e+15*c^2*d*e^2-4*e^3)*x/c^9-1/120*b*(10*c^6*d
^3-20*c^4*d^2*e+15*c^2*d*e^2-4*e^3)*x^3/c^7-1/200*b*e*(20*c^4*d^2-15*c^2*d*
e+4*e^2)*x^5/c^5-1/280*b*(15*c^2*d-4*e)*e^2*x^7/c^3-1/90*b*e^3*x^9/c+1/40*b
*(c^2*d-e)^4*(c^2*d+4*e)*arctan(c*x)/c^10/e^2-1/8*d*(e*x^2+d)^4*(a+b*arctan
(c*x))/e^2+1/10*(e*x^2+d)^5*(a+b*arctan(c*x))/e^2
```

Rubi [A] time = 0.46, antiderivative size = 285, normalized size of antiderivative = 1.19, number of steps used = 8, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {266, 43, 4976, 12, 528, 388, 203}

$$\frac{\left(d+ex^2\right)^5 \left(a+b\tan^{-1}(cx)\right)}{10e^2}-\frac{d\left(d+ex^2\right)^4 \left(a+b\tan^{-1}(cx)\right)}{8e^2}-\frac{bx\left(25c^4d^2-135c^2de+84e^2\right)\left(d+ex^2\right)^2}{4200c^5e}+\frac{bx\left(750c^4\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (b*(325*c^8*d^4 + 1815*c^6*d^3*e - 4977*c^4*d^2*e^2 + 4305*c^2*d*e^3 - 1260
*e^4)*x)/(12600*c^9*e) + (b*(5*c^6*d^3 + 750*c^4*d^2*e - 1071*c^2*d*e^2 + 4
20*e^3)*x*(d + e*x^2))/(12600*c^7*e) - (b*(25*c^4*d^2 - 135*c^2*d*e + 84*e^
2)*x*(d + e*x^2)^2)/(4200*c^5*e) - (b*(23*c^2*d - 36*e)*x*(d + e*x^2)^3)/(2
520*c^3*e) - (b*x*(d + e*x^2)^4)/(90*c*e) + (b*(c^2*d - e)^4*(c^2*d + 4*e)*
ArcTan[c*x])/(40*c^10*e^2) - (d*(d + e*x^2)^4*(a + b*ArcTan[c*x]))/(8*e^2)
+ ((d + e*x^2)^5*(a + b*ArcTan[c*x]))/(10*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 388

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Si
mp[(d*x*(a + b*x^n)^(p + 1))/(b*(n*(p + 1) + 1)), x] - Dist[(a*d - b*c*(n*(
```

```
p + 1) + 1))/(b*(n*(p + 1) + 1)), Int[(a + b*x^n)^p, x], x] /; FreeQ[{a, b,
 c, d, n}, x] && NeQ[b*c - a*d, 0] && NeQ[n*(p + 1) + 1, 0]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] && !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] && !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] && !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^3\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)dx=-\frac{d\left(d+ex^2\right)^4\left(a+b\tan^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\tan^{-1}(cx)\right)}{10e^2}-(bc)$$

$$=-\frac{d\left(d+ex^2\right)^4\left(a+b\tan^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\tan^{-1}(cx)\right)}{10e^2}-\frac{(bc)}{}$$

$$=-\frac{bx\left(d+ex^2\right)^4}{90ce}-\frac{d\left(d+ex^2\right)^4\left(a+b\tan^{-1}(cx)\right)}{8e^2}+\frac{\left(d+ex^2\right)^5\left(a+b\tan\right)}{10e^2}$$

$$=-\frac{b\left(23c^2d-36e\right)x\left(d+ex^2\right)^3}{2520c^3e}-\frac{bx\left(d+ex^2\right)^4}{90ce}-\frac{d\left(d+ex^2\right)^4\left(a+b\tan\right)}{8e^2}$$

$$=-\frac{b\left(25c^4d^2-135c^2de+84e^2\right)x\left(d+ex^2\right)^2}{4200c^5e}-\frac{b\left(23c^2d-36e\right)x\left(d+ex\right)}{2520c^3e}$$

$$=\frac{b\left(5c^6d^3+750c^4d^2e-1071c^2de^2+420e^3\right)x\left(d+ex^2\right)}{12600c^7e}-\frac{b\left(25c^4d^2-1\right)}{}$$

$$=\frac{b\left(325c^8d^4+1815c^6d^3e-4977c^4d^2e^2+4305c^2de^3-1260e^4\right)x}{12600c^9e}+\frac{b\left(5c\right)}{}$$

$$=\frac{b\left(325c^8d^4+1815c^6d^3e-4977c^4d^2e^2+4305c^2de^3-1260e^4\right)x}{12600c^9e}+\frac{b\left(5c\right)}{}$$

Mathematica [A] time = 0.24, size = 262, normalized size = 1.09

$$\frac{cx\left(315ac^9x^3\left(10d^3+20d^2ex^2+15de^2x^4+4e^3x^6\right)-b\left(5c^8\left(210d^3x^2+252d^2ex^4+135de^2x^6+28e^3x^8\right)-15c^6\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c*x*(315*a*c^9*x^3*(10*d^3 + 20*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6) - b*
(1260*e^3 - 105*c^2*e^2*(45*d + 4*e*x^2) + 63*c^4*e*(100*d^2 + 25*d*e*x^2 +
 4*e^2*x^4) - 15*c^6*(210*d^3 + 140*d^2*e*x^2 + 63*d*e^2*x^4 + 12*e^3*x^6)
+ 5*c^8*(210*d^3*x^2 + 252*d^2*e*x^4 + 135*d*e^2*x^6 + 28*e^3*x^8))) + 315*
b*(-10*c^6*d^3 + 20*c^4*d^2*e - 15*c^2*d*e^2 + 4*e^3 + c^10*x^4*(10*d^3 + 2
0*d^2*e*x^2 + 15*d*e^2*x^4 + 4*e^3*x^6))*ArcTan[c*x])/(12600*c^10)
```

fricas [A] time = 0.46, size = 304, normalized size = 1.27

$$\frac{1260\,ac^{10}e^3x^{10} + 4725\,ac^{10}de^2x^8 - 140\,bc^9e^3x^9 + 6300\,ac^{10}d^2ex^6 + 3150\,ac^{10}d^3x^4 - 45\left(15\,bc^9de^2 - 4\,bc^7e^3\right)x^7 - 6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/12600*(1260*a*c^10*e^3*x^10 + 4725*a*c^10*d*e^2*x^8 - 140*b*c^9*e^3*x^9 +
 6300*a*c^10*d^2*e*x^6 + 3150*a*c^10*d^3*x^4 - 45*(15*b*c^9*d*e^2 - 4*b*c^7
*e^3)*x^7 - 63*(20*b*c^9*d^2*e - 15*b*c^7*d*e^2 + 4*b*c^5*e^3)*x^5 - 105*(1
0*b*c^9*d^3 - 20*b*c^7*d^2*e + 15*b*c^5*d*e^2 - 4*b*c^3*e^3)*x^3 + 315*(10*
b*c^7*d^3 - 20*b*c^5*d^2*e + 15*b*c^3*d*e^2 - 4*b*c*e^3)*x + 315*(4*b*c^10*
e^3*x^10 + 15*b*c^10*d*e^2*x^8 + 20*b*c^10*d^2*e*x^6 + 10*b*c^10*d^3*x^4 -
10*b*c^6*d^3 + 20*b*c^4*d^2*e - 15*b*c^2*d*e^2 + 4*b*e^3)*arctan(c*x))/c^10
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 315, normalized size = 1.31

$$\frac{b\arctan\left(cx\right)e^3}{10c^{10}}+\frac{b\,x^3e^3}{30c^7}+\frac{b\arctan\left(cx\right)x^4d^3}{4}+\frac{b\arctan\left(cx\right)e^3x^{10}}{10}-\frac{b\,e^3x^9}{90c}+\frac{b\,d^3x}{4c^3}-\frac{b\,d^3x^3}{12c}-\frac{b\,d^3\arctan\left(cx\right)}{4c^4}-\frac{b\,e^3x}{10c^9}+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^3*(a+b*arctan(c*x)),x)
```

```
[Out] 1/10/c^10*b*arctan(c*x)*e^3+1/30/c^7*b*x^3*e^3+1/4*b*arctan(c*x)*x^4*d^3+1/
10*b*arctan(c*x)*e^3*x^10-1/90*b*e^3*x^9/c+1/4*b*d^3*x/c^3-1/12*b*d^3*x^3/c
-1/4*b*d^3*arctan(c*x)/c^4-1/10/c^9*b*e^3*x+3/8*a*d*e^2*x^8+1/2*a*d^2*e*x^6
+1/70/c^3*b*x^7*e^3-1/50/c^5*b*x^5*e^3-1/2/c^5*b*d^2*e*x+1/2/c^6*b*arctan(c
*x)*d^2*e-3/8/c^8*b*arctan(c*x)*d*e^2+3/8/c^7*b*d*e^2*x+1/6/c^3*b*x^3*d^2*e
-1/10/c*b*d^2*e*x^5+3/40/c^3*b*x^5*d*e^2-3/56/c*b*d*e^2*x^7-1/8/c^5*b*x^3*d
*e^2+3/8*b*arctan(c*x)*d*e^2*x^8+1/2*b*arctan(c*x)*d^2*e*x^6+1/10*a*e^3*x^1
0+1/4*a*x^4*d^3
```

maxima [A] time = 0.43, size = 268, normalized size = 1.12

$$\frac{1}{10}\,ae^3x^{10}+\frac{3}{8}\,ade^2x^8+\frac{1}{2}\,ad^2ex^6+\frac{1}{4}\,ad^3x^4+\frac{1}{12}\left(3\,x^4\arctan\left(cx\right)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3\,\arctan\left(cx\right)}{c^5}\right)\right)bd^3+\frac{1}{30}\left(15\,x^6\,\mathrm{ar}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/10*a*e^3*x^10 + 3/8*a*d*e^2*x^8 + 1/2*a*d^2*e*x^6 + 1/4*a*d^3*x^4 + 1/12*
(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*d^3 + 1
```

```
/30*(15*x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan
(c*x)/c^7))*b*d^2*e + 1/280*(105*x^8*arctan(c*x) - c*((15*c^6*x^7 - 21*c^4*
x^5 + 35*c^2*x^3 - 105*x)/c^8 + 105*arctan(c*x)/c^9))*b*d*e^2 + 1/3150*(315
*x^10*arctan(c*x) - c*((35*c^8*x^9 - 45*c^6*x^7 + 63*c^4*x^5 - 105*c^2*x^3
+ 315*x)/c^10 - 315*arctan(c*x)/c^11))*b*e^3
```

mupad [B] time = 0.62, size = 599, normalized size = 2.50

$$x^3 \left(\frac{\frac{\frac{b e^3}{10 c^3}-\frac{3 b d e^2}{8 c}}{c^2}+\frac{b d^2 e}{2 c}}{3 c^2}-\frac{b d^3}{12 c}\right)-x^8 \left(\frac{a e^3}{8 c^2}-\frac{a e^2 \left(3 d c^2+e\right)}{8 c^2}\right)+x^6 \left(\frac{\frac{a e^3}{c^2}-\frac{a e^2 \left(3 d c^2+e\right)}{c^2}}{6 c^2}+\frac{a d e \left(d c^2+e\right)}{2 c^2}\right)+x^7 \left(\frac{b}{70}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^3,x)
```

```
[Out] x^3*((((b*e^3)/(10*c^3) - (3*b*d*e^2)/(8*c))/c^2 + (b*d^2*e)/(2*c))/(3*c^2)
 - (b*d^3)/(12*c)) - x^8*((a*e^3)/(8*c^2) - (a*e^2*(e + 3*c^2*d))/(8*c^2))
+ x^6*(((a*e^3)/c^2 - (a*e^2*(e + 3*c^2*d))/c^2)/(6*c^2) + (a*d*e*(e + c^2*
d))/(2*c^2)) + x^7*((b*e^3)/(70*c^3) - (3*b*d*e^2)/(56*c)) + atan(c*x)*((b*
d^3*x^4)/4 + (b*e^3*x^10)/10 + (b*d^2*e*x^6)/2 + (3*b*d*e^2*x^8)/8) - x^5*(
((b*e^3)/(10*c^3) - (3*b*d*e^2)/(8*c))/(5*c^2) + (b*d^2*e)/(10*c)) + x^2*((
(((a*e^3)/c^2 - (a*e^2*(e + 3*c^2*d))/c^2)/c^2 + (3*a*d*e*(e + c^2*d))/c^2)
/c^2 - (a*d^2*(3*e + c^2*d))/c^2)/(2*c^2) + (a*d^3)/(2*c^2)) - x^4*((((a*e^
3)/c^2 - (a*e^2*(e + 3*c^2*d))/c^2)/c^2 + (3*a*d*e*(e + c^2*d))/c^2)/(4*c^2
) - (a*d^2*(3*e + c^2*d))/(4*c^2)) + (a*e^3*x^10)/10 - (x*((((b*e^3)/(10*c^
3) - (3*b*d*e^2)/(8*c))/c^2 + (b*d^2*e)/(2*c))/c^2 - (b*d^3)/(4*c)))/c^2 -
(b*e^3*x^9)/(90*c) + (b*atan((b*c*x*(4*e^3 - 10*c^6*d^3 - 15*c^2*d*e^2 + 20
*c^4*d^2*e))/(4*b*e^3 - 10*b*c^6*d^3 - 15*b*c^2*d*e^2 + 20*b*c^4*d^2*e))*(4
*e^3 - 10*c^6*d^3 - 15*c^2*d*e^2 + 20*c^4*d^2*e))/(40*c^10)
```

sympy [A] time = 6.75, size = 411, normalized size = 1.71

$$\begin{cases} \frac{ad^3x^4}{4}+\frac{ad^2ex^6}{2}+\frac{3ade^2x^8}{8}+\frac{ae^3x^{10}}{10}+\frac{bd^3x^4\operatorname{atan}(cx)}{4}+\frac{bd^2ex^6\operatorname{atan}(cx)}{2}+\frac{3bde^2x^8\operatorname{atan}(cx)}{8}+\frac{be^3x^{10}\operatorname{atan}(cx)}{10}-\frac{bd^3x^3}{12c}-\frac{bd^2ex^5}{10c}- \\ a\left(\frac{d^3x^4}{4}+\frac{d^2ex^6}{2}+\frac{3de^2x^8}{8}+\frac{e^3x^{10}}{10}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**3*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**4/4 + a*d**2*e*x**6/2 + 3*a*d*e**2*x**8/8 + a*e**3*x**
10/10 + b*d**3*x**4*atan(c*x)/4 + b*d**2*e*x**6*atan(c*x)/2 + 3*b*d*e**2*x*
*8*atan(c*x)/8 + b*e**3*x**10*atan(c*x)/10 - b*d**3*x**3/(12*c) - b*d**2*e*
x**5/(10*c) - 3*b*d*e**2*x**7/(56*c) - b*e**3*x**9/(90*c) + b*d**3*x/(4*c**
3) + b*d**2*e*x**3/(6*c**3) + 3*b*d*e**2*x**5/(40*c**3) + b*e**3*x**7/(70*c
**3) - b*d**3*atan(c*x)/(4*c**4) - b*d**2*e*x/(2*c**5) - b*d*e**2*x**3/(8*c
**5) - b*e**3*x**5/(50*c**5) + b*d**2*e*atan(c*x)/(2*c**6) + 3*b*d*e**2*x/(
8*c**7) + b*e**3*x**3/(30*c**7) - 3*b*d*e**2*atan(c*x)/(8*c**8) - b*e**3*x/
(10*c**9) + b*e**3*atan(c*x)/(10*c**10), Ne(c, 0)), (a*(d**3*x**4/4 + d**2*
e*x**6/2 + 3*d*e**2*x**8/8 + e**3*x**10/10), True))
```

3.1138 $\int x^2 \left(d+ex^2\right)^3 \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=239

$$\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\tan^{-1}(cx)\right)+\frac{1}{9}e^3x^9\left(a+b\tan^{-1}(cx)\right)-\frac{be^2x^6\left(27\right.}{378}$$

```
[Out] -1/630*b*(105*c^6*d^3-189*c^4*d^2*e+135*c^2*d*e^2-35*e^3)*x^2/c^7-1/1260*b*
e*(189*c^4*d^2-135*c^2*d*e+35*e^2)*x^4/c^5-1/378*b*(27*c^2*d-7*e)*e^2*x^6/c
^3-1/72*b*e^3*x^8/c+1/3*d^3*x^3*(a+b*arctan(c*x))+3/5*d^2*e*x^5*(a+b*arctan
(c*x))+3/7*d*e^2*x^7*(a+b*arctan(c*x))+1/9*e^3*x^9*(a+b*arctan(c*x))+1/630*
b*(105*c^6*d^3-189*c^4*d^2*e+135*c^2*d*e^2-35*e^3)*ln(c^2*x^2+1)/c^9
```

Rubi [A] time = 0.38, antiderivative size = 239, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {270, 4976, 12, 1799, 1620}

$$\frac{3}{5}d^2ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\tan^{-1}(cx)\right)+\frac{1}{9}e^3x^9\left(a+b\tan^{-1}(cx)\right)-\frac{bex^4\left(189\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(105*c^6*d^3 - 189*c^4*d^2*e + 135*c^2*d*e^2 - 35*e^3)*x^2)/(630*c^7) -
 (b*e*(189*c^4*d^2 - 135*c^2*d*e + 35*e^2)*x^4)/(1260*c^5) - (b*(27*c^2*d -
 7*e)*e^2*x^6)/(378*c^3) - (b*e^3*x^8)/(72*c) + (d^3*x^3*(a + b*ArcTan[c*x]
))/3 + (3*d^2*e*x^5*(a + b*ArcTan[c*x]))/5 + (3*d*e^2*x^7*(a + b*ArcTan[c*x
]))/7 + (e^3*x^9*(a + b*ArcTan[c*x]))/9 + (b*(105*c^6*d^3 - 189*c^4*d^2*e +
 135*c^2*d*e^2 - 35*e^3)*Log[1 + c^2*x^2])/(630*c^9)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
```

```
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^2\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)dx=\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\,\mathrm{ta}\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\,\mathrm{ta}\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\,\mathrm{ta}\right.$$

$$=\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\,\mathrm{ta}\right.$$

$$=-\frac{b\left(105c^6d^3-189c^4d^2e+135c^2de^2-35e^3\right)x^2}{630c^7}-\frac{be\left(189c^4d^2-135c^2d\right.}{1260c^5}$$

Mathematica [A] time = 0.22, size = 252, normalized size = 1.05

$$\frac{1}{3}d^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}d^2ex^5\left(a+b\tan^{-1}(cx)\right)+\frac{3}{7}de^2x^7\left(a+b\tan^{-1}(cx)\right)+\frac{1}{9}e^3x^9\left(a+b\tan^{-1}(cx)\right)-\frac{1}{6}bd^3\left(\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (d^3*x^3*(a + b*ArcTan[c*x]))/3 + (3*d^2*e*x^5*(a + b*ArcTan[c*x]))/5 + (3*
d*e^2*x^7*(a + b*ArcTan[c*x]))/7 + (e^3*x^9*(a + b*ArcTan[c*x]))/9 + (b*e^3
*((12*x^2)/c^7 - (6*x^4)/c^5 + (4*x^6)/c^3 - (3*x^8)/c - (12*Log[1 + c^2*x^
2])/c^9))/216 - (b*d*e^2*((6*x^2)/c^5 - (3*x^4)/c^3 + (2*x^6)/c - (6*Log[1
+ c^2*x^2])/c^7))/28 + (3*b*d^2*e*((2*x^2)/c^3 - x^4/c - (2*Log[1 + c^2*x^2
])/c^5))/20 - (b*d^3*(x^2/c - Log[1 + c^2*x^2]/c^3))/6
```

fricas [A] time = 0.48, size = 277, normalized size = 1.16

$$\frac{840\,ac^9e^3x^9+3240\,ac^9de^2x^7-105\,bc^8e^3x^8+4536\,ac^9d^2ex^5+2520\,ac^9d^3x^3-20\left(27\,bc^8de^2-7\,bc^6e^3\right)x^6-6\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/7560*(840*a*c^9*e^3*x^9 + 3240*a*c^9*d*e^2*x^7 - 105*b*c^8*e^3*x^8 + 4536
*a*c^9*d^2*e*x^5 + 2520*a*c^9*d^3*x^3 - 20*(27*b*c^8*d*e^2 - 7*b*c^6*e^3)*x
^6 - 6*(189*b*c^8*d^2*e - 135*b*c^6*d*e^2 + 35*b*c^4*e^3)*x^4 - 12*(105*b*c
^8*d^3 - 189*b*c^6*d^2*e + 135*b*c^4*d*e^2 - 35*b*c^2*e^3)*x^2 + 24*(35*b*c
^9*e^3*x^9 + 135*b*c^9*d*e^2*x^7 + 189*b*c^9*d^2*e*x^5 + 105*b*c^9*d^3*x^3)
*arctan(c*x) + 12*(105*b*c^6*d^3 - 189*b*c^4*d^2*e + 135*b*c^2*d*e^2 - 35*b
*e^3)*log(c^2*x^2 + 1))/c^9
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 297, normalized size = 1.24

$$\frac{a\,e^{3}x^{9}}{9}+\frac{3ad\,e^{2}x^{7}}{7}+\frac{3a\,d^{2}e\,x^{5}}{5}+\frac{a\,d^{3}x^{3}}{3}+\frac{b\arctan\left(cx\right)e^{3}x^{9}}{9}+\frac{3b\arctan\left(cx\right)d\,e^{2}x^{7}}{7}+\frac{3b\arctan\left(cx\right)d^{2}e\,x^{5}}{5}+\frac{b\arctan\left(c\right.}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^3*(a+b*arctan(c*x)),x)
```

```
[Out] 1/9*a*e^3*x^9+3/7*a*d*e^2*x^7+3/5*a*d^2*e*x^5+1/3*a*d^3*x^3+1/9*b*arctan(c*
x)*e^3*x^9+3/7*b*arctan(c*x)*d*e^2*x^7+3/5*b*arctan(c*x)*d^2*e*x^5+1/3*b*ar
ctan(c*x)*d^3*x^3-1/6*b*d^3*x^2/c-3/20/c*b*d^2*e*x^4-1/14/c*b*d*e^2*x^6+3/1
0/c^3*b*x^2*d^2*e-1/72*b*e^3*x^8/c+3/28/c^3*b*x^4*d*e^2+1/54/c^3*b*x^6*e^3-
3/14/c^5*b*x^2*d*e^2-1/36/c^5*b*e^3*x^4+1/18/c^7*b*x^2*e^3+1/6*b*d^3*ln(c^2
*x^2+1)/c^3-3/10/c^5*b*ln(c^2*x^2+1)*d^2*e+3/14/c^7*b*ln(c^2*x^2+1)*d*e^2-1
/18/c^9*b*ln(c^2*x^2+1)*e^3
```

maxima [A] time = 0.34, size = 265, normalized size = 1.11

$$\frac{1}{9}\,ae^{3}x^{9}+\frac{3}{7}\,ade^{2}x^{7}+\frac{3}{5}\,ad^{2}ex^{5}+\frac{1}{3}\,ad^{3}x^{3}+\frac{1}{6}\left(2\,x^{3}\arctan\left(cx\right)-c\left(\frac{x^{2}}{c^{2}}-\frac{\log\left(c^{2}x^{2}+1\right)}{c^{4}}\right)\right)bd^{3}+\frac{3}{20}\left(4\,x^{5}\arctan\left(cx\right)-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/9*a*e^3*x^9 + 3/7*a*d*e^2*x^7 + 3/5*a*d^2*e*x^5 + 1/3*a*d^3*x^3 + 1/6*(2*
x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*d^3 + 3/20*(4*x^5*a
rctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*d^2*e +
1/28*(12*x^7*arctan(c*x) - c*((2*c^4*x^6 - 3*c^2*x^4 + 6*x^2)/c^6 - 6*log(c
^2*x^2 + 1)/c^8))*b*d*e^2 + 1/216*(24*x^9*arctan(c*x) - c*((3*c^6*x^8 - 4*c
^4*x^6 + 6*c^2*x^4 - 12*x^2)/c^8 + 12*log(c^2*x^2 + 1)/c^10))*b*e^3
```

mupad [B] time = 0.97, size = 296, normalized size = 1.24

$$\frac{a\,d^3\,x^3}{3}+\frac{a\,e^3\,x^9}{9}+\frac{b\,d^3\,\ln\left(c^2\,x^2+1\right)}{6\,c^3}-\frac{b\,e^3\,\ln\left(c^2\,x^2+1\right)}{18\,c^9}-\frac{b\,d^3\,x^2}{6\,c}-\frac{b\,e^3\,x^8}{72\,c}+\frac{b\,e^3\,x^6}{54\,c^3}-\frac{b\,e^3\,x^4}{36\,c^5}+\frac{b\,e^3\,x^2}{18\,c^7}+\frac{3\,a\,d^2\,e\,x^5}{5}+\frac{3\,a}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^3,x)
```

```
[Out] (a*d^3*x^3)/3 + (a*e^3*x^9)/9 + (b*d^3*log(c^2*x^2 + 1))/(6*c^3) - (b*e^3*l
og(c^2*x^2 + 1))/(18*c^9) - (b*d^3*x^2)/(6*c) - (b*e^3*x^8)/(72*c) + (b*e^3
*x^6)/(54*c^3) - (b*e^3*x^4)/(36*c^5) + (b*e^3*x^2)/(18*c^7) + (3*a*d^2*e*x
^5)/5 + (3*a*d*e^2*x^7)/7 + (b*d^3*x^3*atan(c*x))/3 + (b*e^3*x^9*atan(c*x))
/9 + (3*b*d^2*e*x^5*atan(c*x))/5 + (3*b*d*e^2*x^7*atan(c*x))/7 - (3*b*d^2*e
*log(c^2*x^2 + 1))/(10*c^5) + (3*b*d*e^2*log(c^2*x^2 + 1))/(14*c^7) - (3*b*
d^2*e*x^4)/(20*c) + (3*b*d^2*e*x^2)/(10*c^3) - (b*d*e^2*x^6)/(14*c) + (3*b*
d*e^2*x^4)/(28*c^3) - (3*b*d*e^2*x^2)/(14*c^5)
```

sympy [A] time = 4.92, size = 389, normalized size = 1.63

$$\begin{cases}\frac{ad^{3}x^{3}}{3}+\frac{3ad^{2}ex^{5}}{5}+\frac{3ade^{2}x^{7}}{7}+\frac{ae^{3}x^{9}}{9}+\frac{bd^{3}x^{3}\operatorname{atan}\left(cx\right)}{3}+\frac{3bd^{2}ex^{5}\operatorname{atan}\left(cx\right)}{5}+\frac{3bde^{2}x^{7}\operatorname{atan}\left(cx\right)}{7}+\frac{be^{3}x^{9}\operatorname{atan}\left(cx\right)}{9}-\frac{bd^{3}x^{2}}{6c}-\frac{3bd^{2}ex^{4}}{20c}- \\ a\left(\frac{d^{3}x^{3}}{3}+\frac{3d^{2}ex^{5}}{5}+\frac{3de^{2}x^{7}}{7}+\frac{e^{3}x^{9}}{9}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**3*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**3/3 + 3*a*d**2*e*x**5/5 + 3*a*d*e**2*x**7/7 + a*e**3*x
**9/9 + b*d**3*x**3*atan(c*x)/3 + 3*b*d**2*e*x**5*atan(c*x)/5 + 3*b*d*e**2*
x**7*atan(c*x)/7 + b*e**3*x**9*atan(c*x)/9 - b*d**3*x**2/(6*c) - 3*b*d**2*e
*x**4/(20*c) - b*d*e**2*x**6/(14*c) - b*e**3*x**8/(72*c) + b*d**3*log(x**2
+ c**(-2))/(6*c**3) + 3*b*d**2*e*x**2/(10*c**3) + 3*b*d*e**2*x**4/(28*c**3)
 + b*e**3*x**6/(54*c**3) - 3*b*d**2*e*log(x**2 + c**(-2))/(10*c**5) - 3*b*d
*e**2*x**2/(14*c**5) - b*e**3*x**4/(36*c**5) + 3*b*d*e**2*log(x**2 + c**(-2
))/(14*c**7) + b*e**3*x**2/(18*c**7) - b*e**3*log(x**2 + c**(-2))/(18*c**9)
, Ne(c, 0)), (a*(d**3*x**3/3 + 3*d**2*e*x**5/5 + 3*d*e**2*x**7/7 + e**3*x**
9/9), True))
```

3.1139 $\int x\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=158

$$\frac{\left(d+ex^2\right)^4\left(a+b\tan^{-1}(cx)\right)}{8e}-\frac{b\left(c^2d-e\right)^4\tan^{-1}(cx)}{8c^8e}-\frac{be^2x^5\left(4c^2d-e\right)}{40c^3}-\frac{bx\left(2c^2d-e\right)\left(2c^4d^2-2c^2de+e^2\right)}{8c^7}-\frac{bex^3\left(\right.}{}$$

```
[Out] -1/8*b*(2*c^2*d-e)*(2*c^4*d^2-2*c^2*d*e+e^2)*x/c^7-1/24*b*e*(6*c^4*d^2-4*c^
2*d*e+e^2)*x^3/c^5-1/40*b*(4*c^2*d-e)*e^2*x^5/c^3-1/56*b*e^3*x^7/c-1/8*b*(c
^2*d-e)^4*arctan(c*x)/c^8/e+1/8*(e*x^2+d)^4*(a+b*arctan(c*x))/e
```

Rubi [A] time = 0.15, antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 3, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.158, Rules used = {4974, 390, 203}

$$\frac{\left(d+ex^2\right)^4\left(a+b\tan^{-1}(cx)\right)}{8e}-\frac{bex^3\left(6c^4d^2-4c^2de+e^2\right)}{24c^5}-\frac{bx\left(2c^2d-e\right)\left(2c^4d^2-2c^2de+e^2\right)}{8c^7}-\frac{be^2x^5\left(4c^2d-e\right)}{40c^3}-\frac{b\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(2*c^2*d - e)*(2*c^4*d^2 - 2*c^2*d*e + e^2)*x)/(8*c^7) - (b*e*(6*c^4*d^
2 - 4*c^2*d*e + e^2)*x^3)/(24*c^5) - (b*(4*c^2*d - e)*e^2*x^5)/(40*c^3) - (
b*e^3*x^7)/(56*c) - (b*(c^2*d - e)^4*ArcTan[c*x])/(8*c^8*e) + ((d + e*x^2)^
4*(a + b*ArcTan[c*x]))/(8*e)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 390

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Int[PolynomialDivide[(a + b*x^n)^p, (c + d*x^n)^(-q), x], x] /; FreeQ[{a
, b, c, d}, x] && NeQ[b*c - a*d, 0] && IGtQ[n, 0] && IGtQ[p, 0] && ILtQ[q,
0] && GeQ[p, -q]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)\,dx=\frac{\left(d+ex^2\right)^4\left(a+b\tan^{-1}(cx)\right)}{8e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^4}{1+c^2x^2}\,dx}{8e}$$

$$=\frac{\left(d+ex^2\right)^4\left(a+b\tan^{-1}(cx)\right)}{8e}-\frac{(bc)\int\left(\frac{\left(2c^2d-e\right)e\left(2c^4d^2-2c^2de+e^2\right)}{c^8}+\frac{e^2\left(6c^4d^2-\right.}{c}\right.}{}$$

$$=-\frac{b\left(2c^2d-e\right)\left(2c^4d^2-2c^2de+e^2\right)x}{8c^7}-\frac{be\left(6c^4d^2-4c^2de+e^2\right)x^3}{24c^5}-\frac{b\left(4\right.}{}$$

$$=-\frac{b\left(2c^2d-e\right)\left(2c^4d^2-2c^2de+e^2\right)x}{8c^7}-\frac{be\left(6c^4d^2-4c^2de+e^2\right)x^3}{24c^5}-\frac{b\left(4\right.}{}$$

Mathematica [A] time = 0.17, size = 217, normalized size = 1.37

$$\frac{cx\left(105ac^7x\left(4d^3+6d^2ex^2+4de^2x^4+e^3x^6\right)-3bc^6\left(140d^3+70d^2ex^2+28de^2x^4+5e^3x^6\right)+7bc^4e\left(90d^2+20d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c*x*(105*b*e^3 - 35*b*c^2*e^2*(12*d + e*x^2) + 7*b*c^4*e*(90*d^2 + 20*d*e*
x^2 + 3*e^2*x^4) + 105*a*c^7*x*(4*d^3 + 6*d^2*e*x^2 + 4*d*e^2*x^4 + e^3*x^6
) - 3*b*c^6*(140*d^3 + 70*d^2*e*x^2 + 28*d*e^2*x^4 + 5*e^3*x^6)) + 105*b*(4
*c^6*d^3 - 6*c^4*d^2*e + 4*c^2*d*e^2 - e^3 + c^8*(4*d^3*x^2 + 6*d^2*e*x^4 +
 4*d*e^2*x^6 + e^3*x^8))*ArcTan[c*x])/(840*c^8)
```

fricas [A] time = 0.48, size = 258, normalized size = 1.63

$$\frac{105\,ac^8e^3x^8+420\,ac^8de^2x^6-15\,bc^7e^3x^7+630\,ac^8d^2ex^4+420\,ac^8d^3x^2-21\left(4\,bc^7de^2-bc^5e^3\right)x^5-35\left(6\,bc^7d^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/840*(105*a*c^8*e^3*x^8 + 420*a*c^8*d*e^2*x^6 - 15*b*c^7*e^3*x^7 + 630*a*c
^8*d^2*e*x^4 + 420*a*c^8*d^3*x^2 - 21*(4*b*c^7*d*e^2 - b*c^5*e^3)*x^5 - 35*
(6*b*c^7*d^2*e - 4*b*c^5*d*e^2 + b*c^3*e^3)*x^3 - 105*(4*b*c^7*d^3 - 6*b*c^
5*d^2*e + 4*b*c^3*d*e^2 - b*c*e^3)*x + 105*(b*c^8*e^3*x^8 + 4*b*c^8*d*e^2*x
^6 + 6*b*c^8*d^2*e*x^4 + 4*b*c^8*d^3*x^2 + 4*b*c^6*d^3 - 6*b*c^4*d^2*e + 4*
b*c^2*d*e^2 - b*e^3)*arctan(c*x))/c^8
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 265, normalized size = 1.68

$$\frac{a\,e^3x^8}{8}+\frac{ad\,e^2x^6}{2}+\frac{3a\,d^2e\,x^4}{4}+\frac{a\,x^2d^3}{2}+\frac{b\arctan(cx)\,e^3x^8}{8}+\frac{b\arctan(cx)\,d\,e^2x^6}{2}+\frac{3b\arctan(cx)\,d^2e\,x^4}{4}+\frac{b\arctan(}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^3*(a+b*arctan(c*x)),x)
```

```
[Out] 1/8*a*e^3*x^8+1/2*a*d*e^2*x^6+3/4*a*d^2*e*x^4+1/2*a*x^2*d^3+1/8*b*arctan(c*
x)*e^3*x^8+1/2*b*arctan(c*x)*d*e^2*x^6+3/4*b*arctan(c*x)*d^2*e*x^4+1/2*b*ar
ctan(c*x)*x^2*d^3-1/56*b*e^3*x^7/c-1/10/c*b*x^5*d*e^2-1/4/c*b*x^3*d^2*e-1/2
*b*d^3*x/c+1/40/c^3*b*x^5*e^3+1/6/c^3*b*x^3*d*e^2+3/4/c^3*b*d^2*e*x-1/24/c^
5*b*x^3*e^3-1/2/c^5*b*d*e^2*x+1/8/c^7*b*e^3*x+1/2/c^2*b*arctan(c*x)*d^3-3/4
/c^4*b*arctan(c*x)*d^2*e+1/2/c^6*b*arctan(c*x)*d*e^2-1/8/c^8*b*arctan(c*x)*
e^3
```

maxima [A] time = 0.43, size = 232, normalized size = 1.47

$$\frac{1}{8}ae^3x^8+\frac{1}{2}ade^2x^6+\frac{3}{4}ad^2ex^4+\frac{1}{2}ad^3x^2+\frac{1}{2}\left(x^2\arctan(cx)-c\left(\frac{x}{c^2}-\frac{\arctan(cx)}{c^3}\right)\right)bd^3+\frac{1}{4}\left(3x^4\arctan(cx)-c\left(\frac{c^2x\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/8*a*e^3*x^8 + 1/2*a*d*e^2*x^6 + 3/4*a*d^2*e*x^4 + 1/2*a*d^3*x^2 + 1/2*(x^
2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*d^3 + 1/4*(3*x^4*arctan(c*x)
 - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*d^2*e + 1/30*(15*x^6*arct
an(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*d*
e^2 + 1/840*(105*x^8*arctan(c*x) - c*((15*c^6*x^7 - 21*c^4*x^5 + 35*c^2*x^3
 - 105*x)/c^8 + 105*arctan(c*x)/c^9))*b*e^3
```

mupad [B] time = 0.56, size = 442, normalized size = 2.80

$$x\left(\frac{\frac{\frac{b\,e^3}{8\,c^3}-\frac{b\,d\,e^2}{2\,c}}{c^2}+\frac{3\,b\,d^2\,e}{4\,c}}{c^2}-\frac{b\,d^3}{2\,c}\right)-x^6\left(\frac{a\,e^3}{6\,c^2}-\frac{a\,e^2\,\left(3\,d\,c^2+e\right)}{6\,c^2}\right)+x^4\left(\frac{\frac{a\,e^3}{c^2}-\frac{a\,e^2\,\left(3\,d\,c^2+e\right)}{c^2}}{4\,c^2}+\frac{3\,a\,d\,e\,\left(d\,c^2+e\right)}{4\,c^2}\right)+x^5\left(\frac{b\,e^3}{40\,c^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*x^2)^3,x)
```

```
[Out] x*((((b*e^3)/(8*c^3) - (b*d*e^2)/(2*c))/c^2 + (3*b*d^2*e)/(4*c))/c^2 - (b*d
^3)/(2*c)) - x^6*((a*e^3)/(6*c^2) - (a*e^2*(e + 3*c^2*d))/(6*c^2)) + x^4*((
(a*e^3)/c^2 - (a*e^2*(e + 3*c^2*d))/c^2)/(4*c^2) + (3*a*d*e*(e + c^2*d))/(4
*c^2)) + x^5*((b*e^3)/(40*c^3) - (b*d*e^2)/(10*c)) + atan(c*x)*((b*d^3*x^2)
/2 + (b*e^3*x^8)/8 + (3*b*d^2*e*x^4)/4 + (b*d*e^2*x^6)/2) - x^3*(((b*e^3)/(
8*c^3) - (b*d*e^2)/(2*c))/(3*c^2) + (b*d^2*e)/(4*c)) - x^2*((((a*e^3)/c^2 -
 (a*e^2*(e + 3*c^2*d))/c^2)/c^2 + (3*a*d*e*(e + c^2*d))/c^2)/(2*c^2) - (a*d
^2*(3*e + c^2*d))/(2*c^2)) + (a*e^3*x^8)/8 - (b*e^3*x^7)/(56*c) - (b*atan((
b*c*x*(e - 2*c^2*d)*(e^2 + 2*c^4*d^2 - 2*c^2*d*e))/(b*e^3 - 4*b*c^6*d^3 - 4
*b*c^2*d*e^2 + 6*b*c^4*d^2*e))*(e - 2*c^2*d)*(e^2 + 2*c^4*d^2 - 2*c^2*d*e))
/(8*c^8)
```

sympy [A] time = 4.57, size = 350, normalized size = 2.22

$$\begin{cases} \frac{ad^3x^2}{2}+\frac{3ad^2ex^4}{4}+\frac{ade^2x^6}{2}+\frac{ae^3x^8}{8}+\frac{bd^3x^2\operatorname{atan}(cx)}{2}+\frac{3bd^2ex^4\operatorname{atan}(cx)}{4}+\frac{bde^2x^6\operatorname{atan}(cx)}{2}+\frac{be^3x^8\operatorname{atan}(cx)}{8}-\frac{bd^3x}{2c}-\frac{bd^2ex^3}{4c}-\frac{bde^2}{10c} \\ a\left(\frac{d^3x^2}{2}+\frac{3d^2ex^4}{4}+\frac{de^2x^6}{2}+\frac{e^3x^8}{8}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**3*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x**2/2 + 3*a*d**2*e*x**4/4 + a*d*e**2*x**6/2 + a*e**3*x**
8/8 + b*d**3*x**2*atan(c*x)/2 + 3*b*d**2*e*x**4*atan(c*x)/4 + b*d*e**2*x**6
```

```
*atan(c*x)/2 + b*e**3*x**8*atan(c*x)/8 - b*d**3*x/(2*c) - b*d**2*e*x**3/(4*
c) - b*d*e**2*x**5/(10*c) - b*e**3*x**7/(56*c) + b*d**3*atan(c*x)/(2*c**2)
+ 3*b*d**2*e*x/(4*c**3) + b*d*e**2*x**3/(6*c**3) + b*e**3*x**5/(40*c**3) -
3*b*d**2*e*atan(c*x)/(4*c**4) - b*d*e**2*x/(2*c**5) - b*e**3*x**3/(24*c**5)
 + b*d*e**2*atan(c*x)/(2*c**6) + b*e**3*x/(8*c**7) - b*e**3*atan(c*x)/(8*c*
*8), Ne(c, 0)), (a*(d**3*x**2/2 + 3*d**2*e*x**4/4 + d*e**2*x**6/2 + e**3*x*
*8/8), True))
```

3.1140 $\int \left(d+ex^2\right)^3 \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=188

$$d^3x\left(a+b\tan^{-1}(cx)\right)+d^2ex^3\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(a+b\tan^{-1}(cx)\right)-\frac{be^2x^4\left(21c^2d-\right.}{140c^3}$$

```
[Out] -1/70*b*e*(35*c^4*d^2-21*c^2*d*e+5*e^2)*x^2/c^5-1/140*b*(21*c^2*d-5*e)*e^2*
x^4/c^3-1/42*b*e^3*x^6/c+d^3*x*(a+b*arctan(c*x))+d^2*e*x^3*(a+b*arctan(c*x)
)+3/5*d*e^2*x^5*(a+b*arctan(c*x))+1/7*e^3*x^7*(a+b*arctan(c*x))-1/70*b*(35*
c^6*d^3-35*c^4*d^2*e+21*c^2*d*e^2-5*e^3)*ln(c^2*x^2+1)/c^7
```

Rubi [A] time = 0.15, antiderivative size = 188, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.222$, Rules used = {194, 4912, 1810, 260}

$$d^2ex^3\left(a+b\tan^{-1}(cx)\right)+d^3x\left(a+b\tan^{-1}(cx)\right)+\frac{3}{5}de^2x^5\left(a+b\tan^{-1}(cx)\right)+\frac{1}{7}e^3x^7\left(a+b\tan^{-1}(cx)\right)-\frac{bex^2\left(35c^4d^2-\right.}{7(}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*e*(35*c^4*d^2 - 21*c^2*d*e + 5*e^2)*x^2)/(70*c^5) - (b*(21*c^2*d - 5*e)
*e^2*x^4)/(140*c^3) - (b*e^3*x^6)/(42*c) + d^3*x*(a + b*ArcTan[c*x]) + d^2*
e*x^3*(a + b*ArcTan[c*x]) + (3*d*e^2*x^5*(a + b*ArcTan[c*x]))/5 + (e^3*x^7*
(a + b*ArcTan[c*x]))/7 - (b*(35*c^6*d^3 - 35*c^4*d^2*e + 21*c^2*d*e^2 - 5*e
^3)*Log[1 + c^2*x^2])/(70*c^7)
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rubi steps

$$\int \left(d+ex^2\right)^3 \left(a+b\tan^{-1}(cx)\right) dx = d^3x \left(a+b\tan^{-1}(cx)\right) + d^2ex^3 \left(a+b\tan^{-1}(cx)\right) + \frac{3}{5}de^2x^5 \left(a+b\tan^{-1}(cx\right.$$

$$= d^3x \left(a+b\tan^{-1}(cx)\right) + d^2ex^3 \left(a+b\tan^{-1}(cx)\right) + \frac{3}{5}de^2x^5 \left(a+b\tan^{-1}(cx\right.$$

$$= -\frac{be\left(35c^4d^2-21c^2de+5e^2\right)x^2}{70c^5} - \frac{b\left(21c^2d-5e\right)e^2x^4}{140c^3} - \frac{be^3x^6}{42c} + d^3x\left(a+\right.$$

$$= -\frac{be\left(35c^4d^2-21c^2de+5e^2\right)x^2}{70c^5} - \frac{b\left(21c^2d-5e\right)e^2x^4}{140c^3} - \frac{be^3x^6}{42c} + d^3x\left(a+\right.$$

Mathematica [A] time = 0.15, size = 192, normalized size = 1.02

$$\frac{c^2x\left(12ac^5\left(35d^3+35d^2ex^2+21de^2x^4+5e^3x^6\right)-bex\left(c^4\left(210d^2+63dex^2+10e^2x^4\right)-3c^2e\left(42d+5ex^2\right)+30\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c^2*x*(12*a*c^5*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6) - b*e*x
*(30*e^2 - 3*c^2*e*(42*d + 5*e*x^2) + c^4*(210*d^2 + 63*d*e*x^2 + 10*e^2*x^
4))) + 12*b*c^7*x*(35*d^3 + 35*d^2*e*x^2 + 21*d*e^2*x^4 + 5*e^3*x^6)*ArcTan
[c*x] - 6*b*(35*c^6*d^3 - 35*c^4*d^2*e + 21*c^2*d*e^2 - 5*e^3)*Log[1 + c^2*
x^2])/(420*c^7)
```

fricas [A] time = 0.51, size = 229, normalized size = 1.22

$$\frac{60\,ac^7e^3x^7+252\,ac^7de^2x^5-10\,bc^6e^3x^6+420\,ac^7d^2ex^3+420\,ac^7d^3x-3\left(21\,bc^6de^2-5\,bc^4e^3\right)x^4-6\left(35\,bc^6d^2e\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] 1/420*(60*a*c^7*e^3*x^7 + 252*a*c^7*d*e^2*x^5 - 10*b*c^6*e^3*x^6 + 420*a*c^
7*d^2*e*x^3 + 420*a*c^7*d^3*x - 3*(21*b*c^6*d*e^2 - 5*b*c^4*e^3)*x^4 - 6*(3
5*b*c^6*d^2*e - 21*b*c^4*d*e^2 + 5*b*c^2*e^3)*x^2 + 12*(5*b*c^7*e^3*x^7 + 2
1*b*c^7*d*e^2*x^5 + 35*b*c^7*d^2*e*x^3 + 35*b*c^7*d^3*x)*arctan(c*x) - 6*(3
5*b*c^6*d^3 - 35*b*c^4*d^2*e + 21*b*c^2*d*e^2 - 5*b*e^3)*log(c^2*x^2 + 1))/
c^7
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 239, normalized size = 1.27

$$\frac{a\,x^7e^3}{7}+\frac{3a\,x^5d\,e^2}{5}+a\,x^3d^2e+a\,d^3x+\frac{b\arctan\left(cx\right)x^7e^3}{7}+\frac{3b\arctan\left(cx\right)x^5d\,e^2}{5}+b\arctan\left(cx\right)x^3d^2e+b\arctan\left(cx\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x)),x)
```

```
[Out] 1/7*a*x^7*e^3+3/5*a*x^5*d*e^2+a*x^3*d^2*e+a*d^3*x+1/7*b*arctan(c*x)*x^7*e^3
+3/5*b*arctan(c*x)*x^5*d*e^2+b*arctan(c*x)*x^3*d^2*e+b*arctan(c*x)*d^3*x-1/
2/c*b*x^2*d^2*e-3/20/c*b*x^4*d*e^2-1/42*b*e^3*x^6/c+3/10/c^3*b*x^2*d*e^2+1/
28/c^3*b*e^3*x^4-1/14/c^5*b*x^2*e^3-1/2/c*b*ln(c^2*x^2+1)*d^3+1/2/c^3*b*ln(
c^2*x^2+1)*d^2*e-3/10/c^5*b*ln(c^2*x^2+1)*d*e^2+1/14/c^7*b*ln(c^2*x^2+1)*e^
3
```

maxima [A] time = 0.33, size = 222, normalized size = 1.18

$$\frac{1}{7}ae^3x^7+\frac{3}{5}ade^2x^5+ad^2ex^3+\frac{1}{2}\left(2x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)bd^2e+\frac{3}{20}\left(4x^5\arctan(cx)-c\left(\frac{c^2x^4-2}{c^4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/7*a*e^3*x^7 + 3/5*a*d*e^2*x^5 + a*d^2*e*x^3 + 1/2*(2*x^3*arctan(c*x) - c*
(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*b*d^2*e + 3/20*(4*x^5*arctan(c*x) - c*((c
^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*d*e^2 + 1/84*(12*x^7*arcta
n(c*x) - c*((2*c^4*x^6 - 3*c^2*x^4 + 6*x^2)/c^6 - 6*log(c^2*x^2 + 1)/c^8))*
b*e^3 + a*d^3*x + 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d^3/c
```

mupad [B] time = 0.43, size = 238, normalized size = 1.27

$$\frac{a\,e^3\,x^7}{7}+a\,d^3\,x-\frac{b\,d^3\,\ln\left(c^2\,x^2+1\right)}{2\,c}+\frac{b\,e^3\,\ln\left(c^2\,x^2+1\right)}{14\,c^7}-\frac{b\,e^3\,x^6}{42\,c}+\frac{b\,e^3\,x^4}{28\,c^3}-\frac{b\,e^3\,x^2}{14\,c^5}+b\,d^3\,x\,\mathrm{atan}\left(c\,x\right)+a\,d^2\,e\,x^3+\frac{3\,a\,d\,e}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*x^2)^3,x)
```

```
[Out] (a*e^3*x^7)/7 + a*d^3*x - (b*d^3*log(c^2*x^2 + 1))/(2*c) + (b*e^3*log(c^2*x
^2 + 1))/(14*c^7) - (b*e^3*x^6)/(42*c) + (b*e^3*x^4)/(28*c^3) - (b*e^3*x^2)
/(14*c^5) + b*d^3*x*atan(c*x) + a*d^2*e*x^3 + (3*a*d*e^2*x^5)/5 + (b*e^3*x^
7*atan(c*x))/7 + b*d^2*e*x^3*atan(c*x) + (3*b*d*e^2*x^5*atan(c*x))/5 + (b*d
^2*e*log(c^2*x^2 + 1))/(2*c^3) - (3*b*d*e^2*log(c^2*x^2 + 1))/(10*c^5) - (b
*d^2*e*x^2)/(2*c) - (3*b*d*e^2*x^4)/(20*c) + (3*b*d*e^2*x^2)/(10*c^3)
```

sympy [A] time = 3.10, size = 306, normalized size = 1.63

$$\begin{cases} ad^3x + ad^2ex^3 + \frac{3ade^2x^5}{5} + \frac{ae^3x^7}{7} + bd^3x\,\mathrm{atan}\,(cx) + bd^2ex^3\,\mathrm{atan}\,(cx) + \frac{3bde^2x^5\,\mathrm{atan}\,(cx)}{5} + \frac{be^3x^7\,\mathrm{atan}\,(cx)}{7} - \frac{bd^3\log\left(x^2+\frac{1}{c^2}\right.}{2c} \\ a\left(d^3x + d^2ex^3 + \frac{3de^2x^5}{5} + \frac{e^3x^7}{7}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x)),x)
```

```
[Out] Piecewise((a*d**3*x + a*d**2*e*x**3 + 3*a*d*e**2*x**5/5 + a*e**3*x**7/7 + b
*d**3*x*atan(c*x) + b*d**2*e*x**3*atan(c*x) + 3*b*d*e**2*x**5*atan(c*x)/5 +
 b*e**3*x**7*atan(c*x)/7 - b*d**3*log(x**2 + c**(-2))/(2*c) - b*d**2*e*x**2
/(2*c) - 3*b*d*e**2*x**4/(20*c) - b*e**3*x**6/(42*c) + b*d**2*e*log(x**2 +
c**(-2))/(2*c**3) + 3*b*d*e**2*x**2/(10*c**3) + b*e**3*x**4/(28*c**3) - 3*b
*d*e**2*log(x**2 + c**(-2))/(10*c**5) - b*e**3*x**2/(14*c**5) + b*e**3*log(
x**2 + c**(-2))/(14*c**7), Ne(c, 0)), (a*(d**3*x + d**2*e*x**3 + 3*d*e**2*x
**5/5 + e**3*x**7/7), True))
```

3.1141 $\int \frac{(d+ex^2)^3(a+b\tan^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=228

$$\frac{3}{2}d^2ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a+b\tan^{-1}(cx)\right)+ad^3\log(x)+\frac{be^3\tan^{-1}(cx)}{6c^6}-\frac{be^3x}{6c^5}$$

```
[Out] -3/2*b*d^2*e*x/c+3/4*b*d*e^2*x/c^3-1/6*b*e^3*x/c^5-1/4*b*d*e^2*x^3/c+1/18*b
*e^3*x^3/c^3-1/30*b*e^3*x^5/c+3/2*b*d^2*e*arctan(c*x)/c^2-3/4*b*d*e^2*arcta
n(c*x)/c^4+1/6*b*e^3*arctan(c*x)/c^6+3/2*d^2*e*x^2*(a+b*arctan(c*x))+3/4*d*
e^2*x^4*(a+b*arctan(c*x))+1/6*e^3*x^6*(a+b*arctan(c*x))+a*d^3*ln(x)+1/2*I*b
*d^3*polylog(2,-I*c*x)-1/2*I*b*d^3*polylog(2,I*c*x)
```

Rubi [A] time = 0.22, antiderivative size = 228, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4980, 4848, 2391, 4852, 321, 203, 302}

$$\frac{1}{2}ibd^3\text{PolyLog}(2,-icx)-\frac{1}{2}ibd^3\text{PolyLog}(2,icx)+\frac{3}{2}d^2ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] (-3*b*d^2*e*x)/(2*c) + (3*b*d*e^2*x)/(4*c^3) - (b*e^3*x)/(6*c^5) - (b*d*e^2
*x^3)/(4*c) + (b*e^3*x^3)/(18*c^3) - (b*e^3*x^5)/(30*c) + (3*b*d^2*e*ArcTan
[c*x])/(2*c^2) - (3*b*d*e^2*ArcTan[c*x])/(4*c^4) + (b*e^3*ArcTan[c*x])/(6*c
^6) + (3*d^2*e*x^2*(a + b*ArcTan[c*x]))/2 + (3*d*e^2*x^4*(a + b*ArcTan[c*x]
))/4 + (e^3*x^6*(a + b*ArcTan[c*x]))/6 + a*d^3*Log[x] + (I/2)*b*d^3*PolyLog
[2, (-I)*c*x] - (I/2)*b*d^3*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
```

```
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{x}\,dx=\int\left(\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}+3d^2ex\left(a+b\tan^{-1}(cx)\right)+3de^2x^3\left(a+b\tan^{-1}(cx\right.\right.$$
$$=d^3\int\frac{a+b\tan^{-1}(cx)}{x}\,dx+\left(3d^2e\right)\int x\left(a+b\tan^{-1}(cx)\right)dx+\left(3de^2\right)\int x^3\left(a\right.$$
$$=\frac{3}{2}d^2ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a+b\tan^{-1}(c\right.$$
$$=-\frac{3bd^2ex}{2c}+\frac{3}{2}d^2ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a\right.$$
$$=-\frac{3bd^2ex}{2c}+\frac{3bde^2x}{4c^3}-\frac{be^3x}{6c^5}-\frac{bde^2x^3}{4c}+\frac{be^3x^3}{18c^3}-\frac{be^3x^5}{30c}+\frac{3bd^2e\tan^{-1}(cx)}{2c^2}+$$
$$=-\frac{3bd^2ex}{2c}+\frac{3bde^2x}{4c^3}-\frac{be^3x}{6c^5}-\frac{bde^2x^3}{4c}+\frac{be^3x^3}{18c^3}-\frac{be^3x^5}{30c}+\frac{3bd^2e\tan^{-1}(cx)}{2c^2}-$$

Mathematica [A] time = 0.18, size = 190, normalized size = 0.83

$$\frac{3}{2}d^2ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{3}{4}de^2x^4\left(a+b\tan^{-1}(cx)\right)+\frac{1}{6}e^3x^6\left(a+b\tan^{-1}(cx)\right)+ad^3\log(x)-\frac{3bd^2e\left(cx-\tan^{-1}(cx)\right)}{2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] -1/90*(b*e^3*(15*c*x - 5*c^3*x^3 + 3*c^5*x^5 - 15*ArcTan[c*x]))/c^6 - (3*b*
d^2*e*(c*x - ArcTan[c*x]))/(2*c^2) - (b*d*e^2*(-3*c*x + c^3*x^3 + 3*ArcTan[
c*x]))/(4*c^4) + (3*d^2*e*x^2*(a + b*ArcTan[c*x]))/2 + (3*d*e^2*x^4*(a + b*
ArcTan[c*x]))/4 + (e^3*x^6*(a + b*ArcTan[c*x]))/6 + a*d^3*Log[x] + (I/2)*b*
d^3*PolyLog[2, (-I)*c*x] - (I/2)*b*d^3*PolyLog[2, I*c*x]
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ae^3x^6+3\,ade^2x^4+3\,ad^2ex^2+ad^3+\left(be^3x^6+3\,bde^2x^4+3\,bd^2ex^2+bd^3\right)\arctan\left(cx\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arctan(c*x))/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.06, size = 272, normalized size = 1.19

$$\frac{a\,x^6e^3}{6}+\frac{3a\,x^4d\,e^2}{4}+\frac{3a\,x^2d^2e}{2}+d^3a\ln(cx)+\frac{b\arctan(cx)\,x^6e^3}{6}+\frac{3b\arctan(cx)\,x^4d\,e^2}{4}+\frac{3b\arctan(cx)\,x^2d^2e}{2}+b\,\text{ar}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x,x)
```

```
[Out] 1/6*a*x^6*e^3+3/4*a*x^4*d*e^2+3/2*a*x^2*d^2*e+d^3*a*ln(c*x)+1/6*b*arctan(c*
x)*x^6*e^3+3/4*b*arctan(c*x)*x^4*d*e^2+3/2*b*arctan(c*x)*x^2*d^2*e+b*arctan
(c*x)*d^3*ln(c*x)-1/30*b*e^3*x^5/c-1/4*b*d*e^2*x^3/c-3/2*b*d^2*e*x/c+1/18*b
*e^3*x^3/c^3+3/4*b*d*e^2*x/c^3-1/6*b*e^3*x/c^5+3/2*b*d^2*e*arctan(c*x)/c^2-
3/4*b*d*e^2*arctan(c*x)/c^4+1/6*b*e^3*arctan(c*x)/c^6-1/2*I*b*d^3*dilog(1-I
*c*x)+1/2*I*b*d^3*ln(c*x)*ln(1+I*c*x)-1/2*I*b*d^3*ln(c*x)*ln(1-I*c*x)+1/2*I
*b*d^3*dilog(1+I*c*x)
```

maxima [A] time = 0.66, size = 251, normalized size = 1.10

$$\frac{1}{6}\,ae^3x^6+\frac{3}{4}\,ade^2x^4+\frac{3}{2}\,ad^2ex^2+ad^3\log(x)-\frac{6\,bc^5e^3x^5+45\,\pi bc^6d^3\log\left(c^2x^2+1\right)-180\,bc^6d^3\arctan(cx)\log(cx}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] 1/6*a*e^3*x^6 + 3/4*a*d*e^2*x^4 + 3/2*a*d^2*e*x^2 + a*d^3*log(x) - 1/180*(6
*b*c^5*e^3*x^5 + 45*pi*b*c^6*d^3*log(c^2*x^2 + 1) - 180*b*c^6*d^3*arctan(c*
x)*log(c*x) + 90*I*b*c^6*d^3*dilog(I*c*x + 1) - 90*I*b*c^6*d^3*dilog(-I*c*x
 + 1) + 5*(9*b*c^5*d*e^2 - 2*b*c^3*e^3)*x^3 + 15*(18*b*c^5*d^2*e - 9*b*c^3*
d*e^2 + 2*b*c*e^3)*x - 15*(2*b*c^6*e^3*x^6 + 9*b*c^6*d*e^2*x^4 + 18*b*c^6*d
^2*e*x^2 + 18*b*c^4*d^2*e - 9*b*c^2*d*e^2 + 2*b*e^3)*arctan(c*x))/c^6
```

mupad [B] time = 0.78, size = 232, normalized size = 1.02

$$\begin{cases} \frac{a\,e^3\,x^6}{6}+a\,d^3\,\ln(x)+\frac{3\,a\,d^2\,e\,x^2}{2}+ \\ \frac{a\,e^3\,x^6}{6}+a\,d^3\,\ln(x)-\frac{b\,e^3\left(\frac{x}{c^4}-\frac{\mathrm{atan}(c\,x)}{c^5}+\frac{x^5}{5}-\frac{x^3}{3\,c^2}\right)}{6\,c}-3\,b\,d^2\,e\left(\frac{x}{2\,c}-\mathrm{atan}\,(c\,x)\left(\frac{1}{2\,c^2}+\frac{x^2}{2}\right)\right)+\frac{3\,a\,d^2\,e\,x^2}{2}+\frac{3\,a\,d\,e^2\,x^4}{4}-3\,b\,c \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x,x)
```

```
[Out] piecewise(c == 0, (a*e^3*x^6)/6 + a*d^3*log(x) + (3*a*d^2*e*x^2)/2 + (3*a*d
*e^2*x^4)/4, c ~= 0, (a*e^3*x^6)/6 + a*d^3*log(x) - (b*d^3*dilog(- c*x*1i +
 1)*1i)/2 + (b*d^3*dilog(c*x*1i + 1)*1i)/2 - (b*e^3*(x/c^4 - atan(c*x)/c^5
```

```
+ x^5/5 - x^3/(3*c^2)))/(6*c) - 3*b*d^2*e*(x/(2*c) - atan(c*x)*(1/(2*c^2) +
 x^2/2)) + (3*a*d^2*e*x^2)/2 + (3*a*d*e^2*x^4)/4 - 3*b*d*e^2*((3*atan(c*x)
- 3*c*x + c^3*x^3)/(12*c^4) - (x^4*atan(c*x))/4) + (b*e^3*x^6*atan(c*x))/6)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\text{atan}\,(cx))\left(d + ex^2\right)^3}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**3/x, x)
```

3.1142 $\int \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=160

$$-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}+3d^2ex\left(a+b\tan^{-1}(cx)\right)+de^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^3x^5\left(a+b\tan^{-1}(cx)\right)-\frac{be^2x^2\left(5c^2d\right.}{10c^3}$$

```
[Out] -1/10*b*(5*c^2*d-e)*e^2*x^2/c^3-1/20*b*e^3*x^4/c-d^3*(a+b*arctan(c*x))/x+3*
d^2*e*x*(a+b*arctan(c*x))+d*e^2*x^3*(a+b*arctan(c*x))+1/5*e^3*x^5*(a+b*arct
an(c*x))+b*c*d^3*ln(x)-1/10*b*(5*c^6*d^3+15*c^4*d^2*e-5*c^2*d*e^2+e^3)*ln(c
^2*x^2+1)/c^5
```

Rubi [A] time = 0.26, antiderivative size = 160, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {270, 4976, 1799, 1620}

$$3d^2ex\left(a+b\tan^{-1}(cx)\right)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x}+de^2x^3\left(a+b\tan^{-1}(cx)\right)+\frac{1}{5}e^3x^5\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(15c^4d^2e+\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -(b*(5*c^2*d - e)*e^2*x^2)/(10*c^3) - (b*e^3*x^4)/(20*c) - (d^3*(a + b*ArcT
an[c*x]))/x + 3*d^2*e*x*(a + b*ArcTan[c*x]) + d*e^2*x^3*(a + b*ArcTan[c*x])
 + (e^3*x^5*(a + b*ArcTan[c*x]))/5 + b*c*d^3*Log[x] - (b*(5*c^6*d^3 + 15*c^
4*d^2*e - 5*c^2*d*e^2 + e^3)*Log[1 + c^2*x^2])/(10*c^5)
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\tan^{-1}(cx))}{x^2}\,dx = -\frac{d^3 (a+b\tan^{-1}(cx))}{x} + 3d^2ex (a+b\tan^{-1}(cx)) + de^2x^3 (a+b\tan^{-1}(cx)) +$$

$$= -\frac{d^3 (a+b\tan^{-1}(cx))}{x} + 3d^2ex (a+b\tan^{-1}(cx)) + de^2x^3 (a+b\tan^{-1}(cx)) +$$

$$= -\frac{d^3 (a+b\tan^{-1}(cx))}{x} + 3d^2ex (a+b\tan^{-1}(cx)) + de^2x^3 (a+b\tan^{-1}(cx)) +$$

$$= -\frac{b(5c^2d-e)e^2x^2}{10c^3} - \frac{be^3x^4}{20c} - \frac{d^3 (a+b\tan^{-1}(cx))}{x} + 3d^2ex (a+b\tan^{-1}(cx))$$

Mathematica [A] time = 0.16, size = 169, normalized size = 1.06

$$\frac{1}{20}\left(-\frac{20ad^3}{x} + 60ad^2ex + 20ade^2x^3 + 4ae^3x^5 + \frac{2be^2x^2(e-5c^2d)}{c^3} - \frac{2b(5c^6d^3+15c^4d^2e-5c^2de^2+e^3)\log(c^2x^2}{c^5}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] ((-20*a*d^3)/x + 60*a*d^2*e*x + (2*b*e^2*(-5*c^2*d + e)*x^2)/c^3 + 20*a*d*e
^2*x^3 - (b*e^3*x^4)/c + 4*a*e^3*x^5 + (4*b*(-5*d^3 + 15*d^2*e*x^2 + 5*d*e^
2*x^4 + e^3*x^6)*ArcTan[c*x])/x + 20*b*c*d^3*Log[x] - (2*b*(5*c^6*d^3 + 15*
c^4*d^2*e - 5*c^2*d*e^2 + e^3)*Log[1 + c^2*x^2])/c^5)/20
```

fricas [A] time = 0.63, size = 206, normalized size = 1.29

$$\frac{4\,ac^5e^3x^6 + 20\,ac^5de^2x^4 - bc^4e^3x^5 + 20\,bc^6d^3x\log(x) + 60\,ac^5d^2ex^2 - 20\,ac^5d^3 - 2\left(5\,bc^4de^2 - bc^2e^3\right)x^3 - 2\left(5\,bc^6\right.}{20\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] 1/20*(4*a*c^5*e^3*x^6 + 20*a*c^5*d*e^2*x^4 - b*c^4*e^3*x^5 + 20*b*c^6*d^3*x
*log(x) + 60*a*c^5*d^2*e*x^2 - 20*a*c^5*d^3 - 2*(5*b*c^4*d*e^2 - b*c^2*e^3)
*x^3 - 2*(5*b*c^6*d^3 + 15*b*c^4*d^2*e - 5*b*c^2*d*e^2 + b*e^3)*x*log(c^2*x
^2 + 1) + 4*(b*c^5*e^3*x^6 + 5*b*c^5*d*e^2*x^4 + 15*b*c^5*d^2*e*x^2 - 5*b*c
^5*d^3)*arctan(c*x))/(c^5*x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 211, normalized size = 1.32

$$\frac{a\,x^5e^3}{5} + a\,x^3d\,e^2 + 3a\,d^2ex - \frac{a\,d^3}{x} + \frac{b\arctan(cx)\,x^5e^3}{5} + b\arctan(cx)\,x^3d\,e^2 + 3b\arctan(cx)\,d^2ex - \frac{b\arctan(cx)\,d^3}{x} - \frac{b\,e}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] 1/5*a*x^5*e^3+a*x^3*d*e^2+3*a*d^2*e*x-a*d^3/x+1/5*b*arctan(c*x)*x^5*e^3+b*a
rctan(c*x)*x^3*d*e^2+3*b*arctan(c*x)*d^2*e*x-b*arctan(c*x)*d^3/x-1/20*b*e^3
*x^4/c-1/2*b*d*e^2*x^2/c+1/10*b/c^3*x^2*e^3+c*b*d^3*ln(c*x)-1/2*b*c*d^3*ln(
c^2*x^2+1)-3/2*b/c*ln(c^2*x^2+1)*d^2*e+1/2*b/c^3*ln(c^2*x^2+1)*d*e^2-1/10*b
/c^5*ln(c^2*x^2+1)*e^3
```

maxima [A] time = 0.33, size = 197, normalized size = 1.23

$$\frac{1}{5}ae^3x^5+ade^2x^3-\frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan\left(cx\right)}{x}\right)bd^3+\frac{1}{2}\left(2x^3\arctan\left(cx\right)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2\right.}{c^4}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] 1/5*a*e^3*x^5 + a*d*e^2*x^3 - 1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arct
an(c*x)/x)*b*d^3 + 1/2*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c
^4))*b*d*e^2 + 1/20*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c
^2*x^2 + 1)/c^6))*b*e^3 + 3*a*d^2*e*x + 3/2*(2*c*x*arctan(c*x) - log(c^2*x^
2 + 1))*b*d^2*e/c - a*d^3/x
```

mupad [B] time = 0.64, size = 236, normalized size = 1.48

$$x\left(\frac{\frac{a\,e^3}{c^2}-\frac{a\,e^2\,\left(3\,d\,c^2+e\right)}{c^2}}{c^2}+\frac{3\,a\,d\,e\,\left(d\,c^2+e\right)}{c^2}\right)-x^3\,\left(\frac{a\,e^3}{3\,c^2}-\frac{a\,e^2\,\left(3\,d\,c^2+e\right)}{3\,c^2}\right)+x^2\,\left(\frac{b\,e^3}{10\,c^3}-\frac{b\,d\,e^2}{2\,c}\right)-\frac{a\,d^3}{x}+\frac{a\,e^3\,x^5}{5}-\frac{\ln}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^2,x)
```

```
[Out] x*(((a*e^3)/c^2 - (a*e^2*(e + 3*c^2*d))/c^2)/c^2 + (3*a*d*e*(e + c^2*d))/c^
2) - x^3*((a*e^3)/(3*c^2) - (a*e^2*(e + 3*c^2*d))/(3*c^2)) + x^2*((b*e^3)/(
10*c^3) - (b*d*e^2)/(2*c)) - (a*d^3)/x + (a*e^3*x^5)/5 - (log(c^2*x^2 + 1)*
(b*e^3 + 5*b*c^6*d^3 - 5*b*c^2*d*e^2 + 15*b*c^4*d^2*e))/(10*c^5) + (atan(c*
x)*((b*e^3*x^6)/5 - b*d^3 + 3*b*d^2*e*x^2 + b*d*e^2*x^4))/x - (b*e^3*x^4)/(
20*c) + b*c*d^3*log(x)
```

sympy [A] time = 3.29, size = 258, normalized size = 1.61

$$\begin{cases}-\frac{ad^3}{x}+3ad^2ex+ade^2x^3+\frac{ae^3x^5}{5}+bcd^3\log\left(x\right)-\frac{bcd^3\log\left(x^2+\frac{1}{c^2}\right)}{2}-\frac{bd^3\operatorname{atan}\left(cx\right)}{x}+3bd^2ex\operatorname{atan}\left(cx\right)+bde^2x^3\operatorname{atan} \\ a\left(-\frac{d^3}{x}+3d^2ex+de^2x^3+\frac{e^3x^5}{5}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**2,x)
```

```
[Out] Piecewise((-a*d**3/x + 3*a*d**2*e*x + a*d*e**2*x**3 + a*e**3*x**5/5 + b*c*d
**3*log(x) - b*c*d**3*log(x**2 + c**(-2))/2 - b*d**3*atan(c*x)/x + 3*b*d**2
*e*x*atan(c*x) + b*d*e**2*x**3*atan(c*x) + b*e**3*x**5*atan(c*x)/5 - 3*b*d*
*2*e*log(x**2 + c**(-2))/(2*c) - b*d*e**2*x**2/(2*c) - b*e**3*x**4/(20*c) +
 b*d*e**2*log(x**2 + c**(-2))/(2*c**3) + b*e**3*x**2/(10*c**3) - b*e**3*log
(x**2 + c**(-2))/(10*c**5), Ne(c, 0)), (a*(-d**3/x + 3*d**2*e*x + d*e**2*x*
*3 + e**3*x**5/5), True))
```

3.1143 $\int \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=200

$$-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\tan^{-1}(cx)\right)+3ad^2e\log(x)-\frac{be^3\tan^{-1}(cx)}{4c^4}+\frac{be^3x}{4c^3}-\frac{1}{2}b$$

```
[Out] -1/2*b*c*d^3/x-3/2*b*d*e^2*x/c+1/4*b*e^3*x/c^3-1/12*b*e^3*x^3/c-1/2*b*c^2*d
^3*arctan(c*x)+3/2*b*d*e^2*arctan(c*x)/c^2-1/4*b*e^3*arctan(c*x)/c^4-1/2*d^
3*(a+b*arctan(c*x))/x^2+3/2*d*e^2*x^2*(a+b*arctan(c*x))+1/4*e^3*x^4*(a+b*ar
ctan(c*x))+3*a*d^2*e*ln(x)+3/2*I*b*d^2*e*polylog(2,-I*c*x)-3/2*I*b*d^2*e*po
lylog(2,I*c*x)
```

Rubi [A] time = 0.21, antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4980, 4852, 325, 203, 4848, 2391, 321, 302}

$$\frac{3}{2}ibd^2e\text{PolyLog}(2,-icx)-\frac{3}{2}ibd^2e\text{PolyLog}(2,icx)-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\text{ta}\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -(b*c*d^3)/(2*x) - (3*b*d*e^2*x)/(2*c) + (b*e^3*x)/(4*c^3) - (b*e^3*x^3)/(1
2*c) - (b*c^2*d^3*ArcTan[c*x])/2 + (3*b*d*e^2*ArcTan[c*x])/(2*c^2) - (b*e^3
*ArcTan[c*x])/(4*c^4) - (d^3*(a + b*ArcTan[c*x]))/(2*x^2) + (3*d*e^2*x^2*(a
 + b*ArcTan[c*x]))/2 + (e^3*x^4*(a + b*ArcTan[c*x]))/4 + 3*a*d^2*e*Log[x] +
 ((3*I)/2)*b*d^2*e*PolyLog[2, (-I)*c*x] - ((3*I)/2)*b*d^2*e*PolyLog[2, I*c*
x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx = \int \left(\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{x^3}+\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}+3de^2x\left(a+b\tan^{-1}(c\right.\right.$$

$$= d^3\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx+\left(3d^2e\right)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+\left(3de^2\right)\int x\left(a\right.$$

$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^3x^4\left(a+b\tan^{-1}(c\right.$$

$$= -\frac{bcd^3}{2x}-\frac{3bde^2x}{2c}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{3}{2}de^2x^2\left(a+b\tan^{-1}(cx)\right)+\frac{1}{4}e^3$$

$$= -\frac{bcd^3}{2x}-\frac{3bde^2x}{2c}+\frac{be^3x}{4c^3}-\frac{be^3x^3}{12c}-\frac{1}{2}bc^2d^3\tan^{-1}(cx)+\frac{3bde^2\tan^{-1}(cx)}{2c^2}-$$

$$= -\frac{bcd^3}{2x}-\frac{3bde^2x}{2c}+\frac{be^3x}{4c^3}-\frac{be^3x^3}{12c}-\frac{1}{2}bc^2d^3\tan^{-1}(cx)+\frac{3bde^2\tan^{-1}(cx)}{2c^2}-$$

Mathematica [C] time = 0.16, size = 170, normalized size = 0.85

$$\frac{1}{12}\left(-\frac{6d^3\left(a+b\tan^{-1}(cx)\right)}{x^2}+18de^2x^2\left(a+b\tan^{-1}(cx)\right)+3e^3x^4\left(a+b\tan^{-1}(cx)\right)+36ad^2e\log(x)-\frac{6bcd^3\,{}_2F_1}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] ((-18*b*d*e^2*(c*x - ArcTan[c*x]))/c^2 - (b*e^3*(-3*c*x + c^3*x^3 + 3*ArcTa
n[c*x]))/c^4 - (6*d^3*(a + b*ArcTan[c*x]))/x^2 + 18*d*e^2*x^2*(a + b*ArcTan
```

```
[c*x]) + 3*e^3*x^4*(a + b*ArcTan[c*x]) - (6*b*c*d^3*Hypergeometric2F1[-1/2,
 1, 1/2, -(c^2*x^2)])/x + 36*a*d^2*e*Log[x] + (18*I)*b*d^2*e*PolyLog[2, (-I
)*c*x] - (18*I)*b*d^2*e*PolyLog[2, I*c*x])/12
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ae^3x^6 + 3\,ade^2x^4 + 3\,ad^2ex^2 + ad^3 + \left(be^3x^6 + 3\,bde^2x^4 + 3\,bd^2ex^2 + bd^3\right)\arctan\left(cx\right)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arctan(c*x))/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 251, normalized size = 1.26

$$\frac{a\,e^3x^4}{4}+\frac{3a\,x^2d\,e^2}{2}+3a\,d^2e\ln\left(cx\right)-\frac{a\,d^3}{2x^2}+\frac{b\arctan\left(cx\right)e^3x^4}{4}+\frac{3b\arctan\left(cx\right)x^2d\,e^2}{2}+3b\arctan\left(cx\right)d^2e\ln\left(cx\right)-\frac{b\,\text{arc}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] 1/4*a*e^3*x^4+3/2*a*x^2*d*e^2+3*a*d^2*e*ln(c*x)-1/2*a*d^3/x^2+1/4*b*arctan(
c*x)*e^3*x^4+3/2*b*arctan(c*x)*x^2*d*e^2+3*b*arctan(c*x)*d^2*e*ln(c*x)-1/2*
b*arctan(c*x)*d^3/x^2-1/12*b*e^3*x^3/c-3/2*b*d*e^2*x/c+1/4*b*e^3*x/c^3-1/2*
b*c*d^3/x-1/2*b*c^2*d^3*arctan(c*x)+3/2*b*d*e^2*arctan(c*x)/c^2-1/4*b*e^3*a
rctan(c*x)/c^4+3/2*I*b*d^2*e*dilog(1+I*c*x)-3/2*I*b*d^2*e*ln(c*x)*ln(1-I*c*
x)+3/2*I*b*d^2*e*ln(c*x)*ln(1+I*c*x)-3/2*I*b*d^2*e*dilog(1-I*c*x)
```

maxima [A] time = 1.66, size = 223, normalized size = 1.12

$$\frac{1}{4}\,ae^3x^4+\frac{3}{2}\,ade^2x^2-\frac{1}{2}\left(\left(c\arctan\left(cx\right)+\frac{1}{x}\right)c+\frac{\arctan\left(cx\right)}{x^2}\right)bd^3+3\,ad^2e\log(x)-\frac{ad^3}{2\,x^2}-\frac{bc^3e^3x^3+9\,\pi bc^4d^2e\log\left(c^2x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*e^3*x^4 + 3/2*a*d*e^2*x^2 - 1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x
)/x^2)*b*d^3 + 3*a*d^2*e*log(x) - 1/2*a*d^3/x^2 - 1/12*(b*c^3*e^3*x^3 + 9*p
i*b*c^4*d^2*e*log(c^2*x^2 + 1) - 36*b*c^4*d^2*e*arctan(c*x)*log(c*x) + 18*I
*b*c^4*d^2*e*dilog(I*c*x + 1) - 18*I*b*c^4*d^2*e*dilog(-I*c*x + 1) + 3*(6*b
*c^3*d*e^2 - b*c*e^3)*x - 3*(b*c^4*e^3*x^4 + 6*b*c^4*d*e^2*x^2 + 6*b*c^2*d*
e^2 - b*e^3)*arctan(c*x))/c^4
```

mupad [B] time = 0.73, size = 224, normalized size = 1.12

$$\begin{cases} \frac{a\,e^3\,x^4}{4}-\frac{a\,d^3}{2\,x^2}+\frac{3\,a\,d\,e^2\,x^2}{2}+3\,a\,d^2\,e\,\ln(x \\ \frac{a\,e^3\,x^4}{4}-\frac{a\,d^3}{2\,x^2}-\frac{b\,d^3\left(c^3\,\mathrm{atan}(c\,x)+\frac{c^2}{x}\right)}{2\,c}-3\,b\,d\,e^2\left(\frac{x}{2\,c}-\mathrm{atan}\left(c\,x\right)\left(\frac{1}{2\,c^2}+\frac{x^2}{2}\right)\right)+\frac{3\,a\,d\,e^2\,x^2}{2}+3\,a\,d^2\,e\,\ln(x)-\frac{b\,e^3\left(3\,\mathrm{atan}(c\,x)-\right.}{12\,c^4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^3,x)
```

```
[Out] piecewise(c == 0, - (a*d^3)/(2*x^2) + (a*e^3*x^4)/4 + (3*a*d*e^2*x^2)/2 + 3
*a*d^2*e*log(x), c ~= 0, - (a*d^3)/(2*x^2) + (a*e^3*x^4)/4 - (b*d^3*(c^3*at
an(c*x) + c^2/x))/(2*c) - 3*b*d*e^2*(x/(2*c) - atan(c*x)*(1/(2*c^2) + x^2/2
)) + (3*a*d*e^2*x^2)/2 + 3*a*d^2*e*log(x) - (b*e^3*(3*atan(c*x) - 3*c*x + c
^3*x^3))/(12*c^4) - (b*d^2*e*dilog(- c*x*1i + 1)*3i)/2 + (b*d^2*e*dilog(c*x
*1i + 1)*3i)/2 - (b*d^3*atan(c*x))/(2*x^2) + (b*e^3*x^4*atan(c*x))/4)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))\left(d + ex^2\right)^3}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**3,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**3/x**3, x)
```

3.1144 $\int \frac{(d+ex^2)^3 (a+b\tan^{-1}(cx))}{x^4}\,dx$

Optimal. Leaf size=158

$$-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}+3de^2x\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^3x^3\left(a+b\tan^{-1}(cx)\right)-\frac{1}{3}bcd^2\log(x)\left(c\right.$$

```
[Out] -1/6*b*c*d^3/x^2-1/6*b*e^3*x^2/c-1/3*d^3*(a+b*arctan(c*x))/x^3-3*d^2*e*(a+b
*arctan(c*x))/x+3*d*e^2*x*(a+b*arctan(c*x))+1/3*e^3*x^3*(a+b*arctan(c*x))-1
/3*b*c*d^2*(c^2*d-9*e)*ln(x)+1/6*b*(c^2*d+e)*(c^4*d^2-10*c^2*d*e+e^2)*ln(c^
2*x^2+1)/c^3
```

Rubi [A] time = 0.26, antiderivative size = 158, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {270, 4976, 12, 1799, 1620}

$$-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}+3de^2x\left(a+b\tan^{-1}(cx)\right)+\frac{1}{3}e^3x^3\left(a+b\tan^{-1}(cx)\right)+\frac{b\left(c^2d+e\right)\left(c^4d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*d^3)/(6*x^2) - (b*e^3*x^2)/(6*c) - (d^3*(a + b*ArcTan[c*x]))/(3*x^3)
- (3*d^2*e*(a + b*ArcTan[c*x]))/x + 3*d*e^2*x*(a + b*ArcTan[c*x]) + (e^3*x^
3*(a + b*ArcTan[c*x]))/3 - (b*c*d^2*(c^2*d - 9*e)*Log[x])/3 + (b*(c^2*d + e
)*(c^4*d^2 - 10*c^2*d*e + e^2)*Log[1 + c^2*x^2])/(6*c^3)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
```

```
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx = -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}+3de^2x\left(a+b\tan^{-1}(cx)\right)$$
$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}+3de^2x\left(a+b\tan^{-1}(cx)\right)$$
$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}+3de^2x\left(a+b\tan^{-1}(cx)\right)$$
$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}+3de^2x\left(a+b\tan^{-1}(cx)\right)$$
$$= -\frac{bcd^3}{6x^2}-\frac{be^3x^2}{6c}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{3x^3}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{x}+3de^2x\Big($$

Mathematica [A] time = 0.17, size = 166, normalized size = 1.05

$$\frac{1}{6}\left(-\frac{2ad^3}{x^3}-\frac{18ad^2e}{x}+18ade^2x+2ae^3x^3-2bcd^2\log(x)\left(c^2d-9e\right)+\frac{b\left(c^6d^3-9c^4d^2e-9c^2de^2+e^3\right)\log\left(c^2x^2\right.}{c^3}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] ((-2*a*d^3)/x^3 - (b*c*d^3)/x^2 - (18*a*d^2*e)/x + 18*a*d*e^2*x - (b*e^3*x^
2)/c + 2*a*e^3*x^3 + (2*b*(-d^3 - 9*d^2*e*x^2 + 9*d*e^2*x^4 + e^3*x^6)*ArcT
an[c*x])/x^3 - 2*b*c*d^2*(c^2*d - 9*e)*Log[x] + (b*(c^6*d^3 - 9*c^4*d^2*e -
 9*c^2*d*e^2 + e^3)*Log[1 + c^2*x^2])/c^3)/6
```

fricas [A] time = 0.46, size = 205, normalized size = 1.30

$$\frac{2\,ac^3e^3x^6+18\,ac^3de^2x^4-bc^2e^3x^5-bc^4d^3x-18\,ac^3d^2ex^2-2\,ac^3d^3+\left(bc^6d^3-9\,bc^4d^2e-9\,bc^2de^2+be^3\right)x^3\log}{6\,c^3x^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] 1/6*(2*a*c^3*e^3*x^6 + 18*a*c^3*d*e^2*x^4 - b*c^2*e^3*x^5 - b*c^4*d^3*x - 1
8*a*c^3*d^2*e*x^2 - 2*a*c^3*d^3 + (b*c^6*d^3 - 9*b*c^4*d^2*e - 9*b*c^2*d*e^
2 + b*e^3)*x^3*log(c^2*x^2 + 1) - 2*(b*c^6*d^3 - 9*b*c^4*d^2*e)*x^3*log(x)
+ 2*(b*c^3*e^3*x^6 + 9*b*c^3*d*e^2*x^4 - 9*b*c^3*d^2*e*x^2 - b*c^3*d^3)*arc
tan(c*x))/(c^3*x^3)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 213, normalized size = 1.35

$$\frac{a\,x^3e^3}{3}+3ad\,e^2x-\frac{a\,d^3}{3x^3}-\frac{3a\,d^2e}{x}+\frac{b\arctan(cx)\,x^3e^3}{3}+3b\arctan(cx)\,d\,e^2x-\frac{b\arctan(cx)\,d^3}{3x^3}-\frac{3b\arctan(cx)\,d^2e}{x}-\frac{b\,e^3x}{6c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] 1/3*a*x^3*e^3+3*a*d*e^2*x-1/3*a*d^3/x^3-3*a*d^2*e/x+1/3*b*arctan(c*x)*x^3*e
^3+3*b*arctan(c*x)*d*e^2*x-1/3*b*arctan(c*x)*d^3/x^3-3*b*arctan(c*x)*d^2*e/
x-1/6*b*e^3*x^2/c-1/3*c^3*b*d^3*ln(c*x)+3*c*b*ln(c*x)*d^2*e-1/6*b*c*d^3/x^2
+1/6*b*c^3*d^3*ln(c^2*x^2+1)-3/2*c*b*ln(c^2*x^2+1)*d^2*e-3/2/c*b*ln(c^2*x^2
+1)*d*e^2+1/6/c^3*b*ln(c^2*x^2+1)*e^3
```

maxima [A] time = 0.34, size = 193, normalized size = 1.22

$$\frac{1}{3}ae^3x^3+\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c-\frac{2\arctan(cx)}{x^3}\right)bd^3-\frac{3}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] 1/3*a*e^3*x^3 + 1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*ar
ctan(c*x)/x^3)*b*d^3 - 3/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)
/x)*b*d^2*e + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*
b*e^3 + 3*a*d*e^2*x + 3/2*(2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d*e^2/c
- 3*a*d^2*e/x - 1/3*a*d^3/x^3
```

mupad [B] time = 0.64, size = 203, normalized size = 1.28

$$\frac{a\,e^3\,x^3}{3}-\ln(x)\,\left(\frac{b\,c^3\,d^3}{3}-3\,b\,c\,d^2\,e\right)-\frac{\frac{b\,c^2\,d^3\,x}{2}+a\,c\,d^3+9\,a\,e\,c\,d^2\,x^2}{3\,c\,x^3}-x\,\left(\frac{a\,e^3}{c^2}-\frac{a\,e^2\,\left(3\,d\,c^2+e\right)}{c^2}\right)+\frac{\ln\left(c^2\,x^2+1\right)\,\left(b\,c^6\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^4,x)
```

```
[Out] (a*e^3*x^3)/3 - log(x)*((b*c^3*d^3)/3 - 3*b*c*d^2*e) - (a*c*d^3 + (b*c^2*d^
3*x)/2 + 9*a*c*d^2*e*x^2)/(3*c*x^3) - x*((a*e^3)/c^2 - (a*e^2*(e + 3*c^2*d)
)/c^2) + (log(c^2*x^2 + 1)*(b*e^3 + b*c^6*d^3 - 9*b*c^2*d*e^2 - 9*b*c^4*d^2
*e))/(6*c^3) - (atan(c*x)*((b*d^3)/3 - (b*e^3*x^6)/3 + 3*b*d^2*e*x^2 - 3*b*
d*e^2*x^4))/x^3 - (b*e^3*x^2)/(6*c)
```

sympy [A] time = 3.30, size = 272, normalized size = 1.72

$$\begin{cases} -\frac{ad^3}{3x^3}-\frac{3ad^2e}{x}+3ade^2x+\frac{ae^3x^3}{3}-\frac{bc^3d^3\log(x)}{3}+\frac{bc^3d^3\log\left(x^2+\frac{1}{c^2}\right)}{6}-\frac{bcd^3}{6x^2}+3bcd^2e\log(x)-\frac{3bcd^2e\log\left(x^2+\frac{1}{c^2}\right)}{2}-\frac{bd^3\operatorname{atan}(cx)}{3x^3} \\ a\left(-\frac{d^3}{3x^3}-\frac{3d^2e}{x}+3de^2x+\frac{e^3x^3}{3}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Piecewise((-a*d**3/(3*x**3) - 3*a*d**2*e/x + 3*a*d*e**2*x + a*e**3*x**3/3 -
 b*c**3*d**3*log(x)/3 + b*c**3*d**3*log(x**2 + c**(-2))/6 - b*c*d**3/(6*x**
2) + 3*b*c*d**2*e*log(x) - 3*b*c*d**2*e*log(x**2 + c**(-2))/2 - b*d**3*atan
(c*x)/(3*x**3) - 3*b*d**2*e*atan(c*x)/x + 3*b*d*e**2*x*atan(c*x) + b*e**3*x
**3*atan(c*x)/3 - 3*b*d*e**2*log(x**2 + c**(-2))/(2*c) - b*e**3*x**2/(6*c)
+ b*e**3*log(x**2 + c**(-2))/(6*c**3), Ne(c, 0)), (a*(-d**3/(3*x**3) - 3*d*
*2*e/x + 3*d*e**2*x + e**3*x**3/3), True))
```

3.1145 $\int \frac{(d+ex^2)^3(a+b\tan^{-1}(cx))}{x^5}\,dx$

Optimal. Leaf size=200

$$-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{4x^4}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{2x^2}+\frac{1}{2}e^3x^2\left(a+b\tan^{-1}(cx)\right)+3ade^2\log(x)+\frac{1}{4}bc^4d^3\tan^{-1}(cx)+\frac{bc^3d}{4x}$$

```
[Out] -1/12*b*c*d^3/x^3+1/4*b*c^3*d^3/x-3/2*b*c*d^2*e/x-1/2*b*e^3*x/c+1/4*b*c^4*d
^3*arctan(c*x)-3/2*b*c^2*d^2*e*arctan(c*x)+1/2*b*e^3*arctan(c*x)/c^2-1/4*d^
3*(a+b*arctan(c*x))/x^4-3/2*d^2*e*(a+b*arctan(c*x))/x^2+1/2*e^3*x^2*(a+b*ar
ctan(c*x))+3*a*d*e^2*ln(x)+3/2*I*b*d*e^2*polylog(2,-I*c*x)-3/2*I*b*d*e^2*po
lylog(2,I*c*x)
```

Rubi [A] time = 0.21, antiderivative size = 200, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4980, 4852, 325, 203, 4848, 2391, 321}

$$\frac{3}{2}ibde^2\text{PolyLog}(2,-icx)-\frac{3}{2}ibde^2\text{PolyLog}(2,icx)-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{2x^2}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{4x^4}+\frac{1}{2}e^3x^2\left(a+b\,\text{t}\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(b*c*d^3)/(12*x^3) + (b*c^3*d^3)/(4*x) - (3*b*c*d^2*e)/(2*x) - (b*e^3*x)/(
2*c) + (b*c^4*d^3*ArcTan[c*x])/4 - (3*b*c^2*d^2*e*ArcTan[c*x])/2 + (b*e^3*A
rcTan[c*x])/(2*c^2) - (d^3*(a + b*ArcTan[c*x]))/(4*x^4) - (3*d^2*e*(a + b*A
rcTan[c*x]))/(2*x^2) + (e^3*x^2*(a + b*ArcTan[c*x]))/2 + 3*a*d*e^2*Log[x] +
 ((3*I)/2)*b*d*e^2*PolyLog[2, (-I)*c*x] - ((3*I)/2)*b*d*e^2*PolyLog[2, I*c*
x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\tan^{-1}(cx))}{x^5}\,dx = \int \left(\frac{d^3 (a+b\tan^{-1}(cx))}{x^5} + \frac{3d^2e (a+b\tan^{-1}(cx))}{x^3} + \frac{3de^2 (a+b\tan^{-1}(cx))}{x}\right.$$

$$= d^3 \int \frac{a+b\tan^{-1}(cx)}{x^5}\,dx + (3d^2e) \int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx + (3de^2) \int \frac{a+b\,\mathrm{ta}}{x}$$

$$= -\frac{d^3 (a+b\tan^{-1}(cx))}{4x^4} - \frac{3d^2e (a+b\tan^{-1}(cx))}{2x^2} + \frac{1}{2}e^3x^2 (a+b\tan^{-1}(cx)) +$$

$$= -\frac{bcd^3}{12x^3} - \frac{3bcd^2e}{2x} - \frac{be^3x}{2c} - \frac{d^3 (a+b\tan^{-1}(cx))}{4x^4} - \frac{3d^2e (a+b\tan^{-1}(cx))}{2x^2} + \frac{1}{2}$$

$$= -\frac{bcd^3}{12x^3} + \frac{bc^3d^3}{4x} - \frac{3bcd^2e}{2x} - \frac{be^3x}{2c} - \frac{3}{2}bc^2d^2e\tan^{-1}(cx) + \frac{be^3\tan^{-1}(cx)}{2c^2} - \frac{d^3 (}{}$$

$$= -\frac{bcd^3}{12x^3} + \frac{bc^3d^3}{4x} - \frac{3bcd^2e}{2x} - \frac{be^3x}{2c} + \frac{1}{4}bc^4d^3\tan^{-1}(cx) - \frac{3}{2}bc^2d^2e\tan^{-1}(cx) +$$

Mathematica [C] time = 0.22, size = 169, normalized size = 0.84

$$\frac{1}{12}\left(-\frac{3d^3 (a+b\tan^{-1}(cx))}{x^4} - \frac{18d^2e (a+b\tan^{-1}(cx))}{x^2} + 6e^3x^2 (a+b\tan^{-1}(cx)) + 36ade^2\log(x) - \frac{bcd^3\,{}_2F_1\left(-\frac{3}{2},1\right.}{x^3}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] ((-6*b*e^3*(c*x - ArcTan[c*x]))/c^2 - (3*d^3*(a + b*ArcTan[c*x]))/x^4 - (18
*d^2*e*(a + b*ArcTan[c*x]))/x^2 + 6*e^3*x^2*(a + b*ArcTan[c*x]) - (b*c*d^3*
Hypergeometric2F1[-3/2, 1, -1/2, -(c^2*x^2)])/x^3 - (18*b*c*d^2*e*Hypergeom
etric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/x + 36*a*d*e^2*Log[x] + (18*I)*b*d*e^2*
PolyLog[2, (-I)*c*x] - (18*I)*b*d*e^2*PolyLog[2, I*c*x])/12
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{ae^3x^6 + 3\,ade^2x^4 + 3\,ad^2ex^2 + ad^3 + (be^3x^6 + 3\,bde^2x^4 + 3\,bd^2ex^2 + bd^3)\arctan(cx)}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arctan(c*x))/x^5, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 251, normalized size = 1.26

$$\frac{a\,x^2e^3}{2}+3ad\,e^2\ln(cx)-\frac{a\,d^3}{4x^4}-\frac{3a\,d^2e}{2x^2}+\frac{b\arctan(cx)\,x^2e^3}{2}+3b\arctan(cx)\,d\,e^2\ln(cx)-\frac{b\arctan(cx)\,d^3}{4x^4}-\frac{3b\arctan}{2x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] 1/2*a*x^2*e^3+3*a*d*e^2*ln(c*x)-1/4*a*d^3/x^4-3/2*a*d^2*e/x^2+1/2*b*arctan(
c*x)*x^2*e^3+3*b*arctan(c*x)*d*e^2*ln(c*x)-1/4*b*arctan(c*x)*d^3/x^4-3/2*b*
arctan(c*x)*d^2*e/x^2-1/2*b*e^3*x/c+1/4*b*c^3*d^3/x-3/2*b*c*d^2*e/x-1/12*b*
c*d^3/x^3+1/4*b*c^4*d^3*arctan(c*x)-3/2*b*c^2*d^2*e*arctan(c*x)+1/2*b*e^3*a
rctan(c*x)/c^2+3/2*I*b*d*e^2*dilog(1+I*c*x)+3/2*I*b*d*e^2*ln(c*x)*ln(1+I*c*
x)-3/2*I*b*d*e^2*dilog(1-I*c*x)-3/2*I*b*d*e^2*ln(c*x)*ln(1-I*c*x)
```

maxima [A] time = 0.64, size = 218, normalized size = 1.09

$$\frac{1}{2}\,ae^3x^2+\frac{1}{12}\left(\left(3\,c^3\arctan(cx)+\frac{3\,c^2x^2-1}{x^3}\right)c-\frac{3\,\arctan(cx)}{x^4}\right)bd^3-\frac{3}{2}\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)bd^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] 1/2*a*e^3*x^2 + 1/12*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arcta
n(c*x)/x^4)*b*d^3 - 3/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d^2*e
 + 3*a*d*e^2*log(x) - 3/2*a*d^2*e/x^2 - 1/4*a*d^3/x^4 - 1/4*(3*pi*b*c^2*d*e
^2*log(c^2*x^2 + 1) - 12*b*c^2*d*e^2*arctan(c*x)*log(c*x) + 6*I*b*c^2*d*e^2
*dilog(I*c*x + 1) - 6*I*b*c^2*d*e^2*dilog(-I*c*x + 1) + 2*b*c*e^3*x - 2*(b*
c^2*e^3*x^2 + b*e^3)*arctan(c*x))/c^2
```

mupad [B] time = 0.71, size = 234, normalized size = 1.17

$$\begin{cases} -\frac{a\left(d^3-2\,e^3\,x^6+6\,d^2\,e\,x^2-12\,d\,e^2\,x^4\,\ln(x)\right)}{4\,x^4} \\ -b\,e^3\left(\frac{x}{2\,c}-\mathrm{atan}(c\,x)\left(\frac{1}{2\,c^2}+\frac{x^2}{2}\right)\right)-\frac{a\left(d^3-2\,e^3\,x^6+6\,d^2\,e\,x^2-12\,d\,e^2\,x^4\,\ln(x)\right)}{4\,x^4}-\frac{b\,d^3\left(\frac{\frac{c^2}{3}-c^4\,x^2}{x^3}-c^5\,\mathrm{atan}(c\,x)\right)}{4\,c}-3\,b\,d^2\,e\left(\frac{c^3\,\mathrm{atan}}{}\right. \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^5,x)
```

```
[Out] piecewise(c == 0, -(a*(d^3 - 2*e^3*x^6 + 6*d^2*e*x^2 - 12*d*e^2*x^4*log(x))
)/(4*x^4), c ~= 0, - b*e^3*(x/(2*c) - atan(c*x)*(1/(2*c^2) + x^2/2)) - (a*(
d^3 - 2*e^3*x^6 + 6*d^2*e*x^2 - 12*d*e^2*x^4*log(x)))/(4*x^4) - (b*d^3*((c^
2/3 - c^4*x^2)/x^3 - c^5*atan(c*x)))/(4*c) - 3*b*d^2*e*((c^3*atan(c*x) + c^
2/x)/(2*c) + atan(c*x)/(2*x^2)) - (b*d*e^2*dilog(- c*x*1i + 1)*3i)/2 + (b*d
*e^2*dilog(c*x*1i + 1)*3i)/2 - (b*d^3*atan(c*x))/(4*x^4))
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))\left(d + ex^2\right)^3}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**5,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**3/x**5, x)
```

3.1146 $\int \frac{(d+ex^2)^3(a+b\tan^{-1}(cx))}{x^6}\,dx$

Optimal. Leaf size=177

$$-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^2e\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{3de^2\left(a+b\tan^{-1}(cx)\right)}{x}+e^3x\left(a+b\tan^{-1}(cx)\right)+\frac{bcd^2\left(c^2d-5e\right)}{10x^2}+$$

```
[Out] -1/20*b*c*d^3/x^4+1/10*b*c*d^2*(c^2*d-5*e)/x^2-1/5*d^3*(a+b*arctan(c*x))/x^
5-d^2*e*(a+b*arctan(c*x))/x^3-3*d*e^2*(a+b*arctan(c*x))/x+e^3*x*(a+b*arctan
(c*x))+1/5*b*c*d*(c^4*d^2-5*c^2*d*e+15*e^2)*ln(x)-1/10*b*(c^6*d^3-5*c^4*d^2
*e+15*c^2*d*e^2+5*e^3)*ln(c^2*x^2+1)/c
```

Rubi [A] time = 0.29, antiderivative size = 177, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.238, Rules used = {270, 4976, 12, 1799, 1620}

$$-\frac{d^2e\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{3de^2\left(a+b\tan^{-1}(cx)\right)}{x}+e^3x\left(a+b\tan^{-1}(cx)\right)-\frac{b\left(-5c^4d^2e+c^6d^3\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] -(b*c*d^3)/(20*x^4) + (b*c*d^2*(c^2*d - 5*e))/(10*x^2) - (d^3*(a + b*ArcTan
[c*x]))/(5*x^5) - (d^2*e*(a + b*ArcTan[c*x]))/x^3 - (3*d*e^2*(a + b*ArcTan[
c*x]))/x + e^3*x*(a + b*ArcTan[c*x]) + (b*c*d*(c^4*d^2 - 5*c^2*d*e + 15*e^2
)*Log[x])/5 - (b*(c^6*d^3 - 5*c^4*d^2*e + 15*c^2*d*e^2 + 5*e^3)*Log[1 + c^2
*x^2])/(10*c)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
```

```
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx = -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^2e\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{3de^2\left(a+b\tan^{-1}(cx)\right)}{x}+e^3$$

$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^2e\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{3de^2\left(a+b\tan^{-1}(cx)\right)}{x}+e^3$$

$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^2e\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{3de^2\left(a+b\tan^{-1}(cx)\right)}{x}+e^3$$

$$= -\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^2e\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{3de^2\left(a+b\tan^{-1}(cx)\right)}{x}+e^3$$

$$= -\frac{bcd^3}{20x^4}+\frac{bcd^2\left(c^2d-5e\right)}{10x^2}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^2e\left(a+b\tan^{-1}(cx)\right)}{x^3}-3$$

Mathematica [A] time = 0.19, size = 184, normalized size = 1.04

$$\frac{1}{20}\left(-\frac{4ad^3}{x^5}-\frac{20ad^2e}{x^3}-\frac{60ade^2}{x}+20ae^3x+\frac{2bcd^2\left(c^2d-5e\right)}{x^2}+4bcd\log(x)\left(c^4d^2-5c^2de+15e^2\right)-\frac{2b\left(c^6d^3-5c^4\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] ((-4*a*d^3)/x^5 - (b*c*d^3)/x^4 - (20*a*d^2*e)/x^3 + (2*b*c*d^2*(c^2*d - 5*
e))/x^2 - (60*a*d*e^2)/x + 20*a*e^3*x - (4*b*(d^3 + 5*d^2*e*x^2 + 15*d*e^2*
x^4 - 5*e^3*x^6)*ArcTan[c*x])/x^5 + 4*b*c*d*(c^4*d^2 - 5*c^2*d*e + 15*e^2)*
Log[x] - (2*b*(c^6*d^3 - 5*c^4*d^2*e + 15*c^2*d*e^2 + 5*e^3)*Log[1 + c^2*x^
2])/c)/20
```

fricas [A] time = 0.48, size = 214, normalized size = 1.21

$$\frac{20\,ace^3x^6-60\,acde^2x^4-bc^2d^3x-20\,acd^2ex^2-2\left(bc^6d^3-5\,bc^4d^2e+15\,bc^2de^2+5\,be^3\right)x^5\log\left(c^2x^2+1\right)+4\left(bc^6\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] 1/20*(20*a*c*e^3*x^6 - 60*a*c*d*e^2*x^4 - b*c^2*d^3*x - 20*a*c*d^2*e*x^2 -
2*(b*c^6*d^3 - 5*b*c^4*d^2*e + 15*b*c^2*d*e^2 + 5*b*e^3)*x^5*log(c^2*x^2 +
1) + 4*(b*c^6*d^3 - 5*b*c^4*d^2*e + 15*b*c^2*d*e^2)*x^5*log(x) - 4*a*c*d^3
+ 2*(b*c^4*d^3 - 5*b*c^2*d^2*e)*x^3 + 4*(5*b*c*e^3*x^6 - 15*b*c*d*e^2*x^4 -
 5*b*c*d^2*e*x^2 - b*c*d^3)*arctan(c*x))/(c*x^5)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 236, normalized size = 1.33

$$a e^3x-\frac{a d^2e}{x^3}-\frac{3ad e^2}{x}-\frac{a d^3}{5x^5}+b\arctan (cx) e^3x-\frac{b\arctan (cx) d^2e}{x^3}-\frac{3b\arctan (cx) d e^2}{x}-\frac{b\arctan (cx) d^3}{5x^5}+\frac{b c^3d^3}{10x^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^6,x)
```

```
[Out] a*e^3*x-a*d^2*e/x^3-3*a*d*e^2/x-1/5*a*d^3/x^5+b*arctan(c*x)*e^3*x-b*arctan(
c*x)*d^2*e/x^3-3*b*arctan(c*x)*d*e^2/x-1/5*b*arctan(c*x)*d^3/x^5+1/10*b*c^3
*d^3/x^2-1/2*c*b*d^2*e/x^2-1/20*b*c*d^3/x^4+1/5*c^5*b*d^3*ln(c*x)-c^3*b*ln(
c*x)*d^2*e+3*c*b*ln(c*x)*d*e^2-1/10*c^5*b*ln(c^2*x^2+1)*d^3+1/2*c^3*b*ln(c^
2*x^2+1)*d^2*e-3/2*c*b*ln(c^2*x^2+1)*d*e^2-1/2/c*b*ln(c^2*x^2+1)*e^3
```

maxima [A] time = 0.33, size = 208, normalized size = 1.18

$$-\frac{1}{20}\left(\left(2\,c^4\log\left(c^2x^2+1\right)-2\,c^4\log\left(x^2\right)-\frac{2\,c^2x^2-1}{x^4}\right)c+\frac{4\,\arctan(cx)}{x^5}\right)bd^3+\frac{1}{2}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x\right.\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] -1/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*c +
4*arctan(c*x)/x^5)*b*d^3 + 1/2*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^
2)*c - 2*arctan(c*x)/x^3)*b*d^2*e - 3/2*(c*(log(c^2*x^2 + 1) - log(x^2)) +
2*arctan(c*x)/x)*b*d*e^2 + a*e^3*x + 1/2*(2*c*x*arctan(c*x) - log(c^2*x^2 +
 1))*b*e^3/c - 3*a*d*e^2/x - a*d^2*e/x^3 - 1/5*a*d^3/x^5
```

mupad [B] time = 0.64, size = 194, normalized size = 1.10

$$\ln(x)\left(\frac{b\,c^5\,d^3}{5}-b\,c^3\,d^2\,e+3\,b\,c\,d\,e^2\right)-\frac{a\,d^3-x^3\,\left(\frac{b\,c^3\,d^3}{2}-\frac{5\,b\,c\,d^2\,e}{2}\right)+\frac{b\,c\,d^3\,x}{4}+5\,a\,d^2\,e\,x^2+15\,a\,d\,e^2\,x^4}{5\,x^5}-\frac{\ln\left(c^2\,x^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^6,x)
```

```
[Out] log(x)*((b*c^5*d^3)/5 + 3*b*c*d*e^2 - b*c^3*d^2*e) - (a*d^3 - x^3*((b*c^3*d
^3)/2 - (5*b*c*d^2*e)/2) + (b*c*d^3*x)/4 + 5*a*d^2*e*x^2 + 15*a*d*e^2*x^4)/
(5*x^5) - (log(c^2*x^2 + 1)*(5*b*e^3 + b*c^6*d^3 + 15*b*c^2*d*e^2 - 5*b*c^4
*d^2*e))/(10*c) - (atan(c*x)*((b*d^3)/5 - b*e^3*x^6 + b*d^2*e*x^2 + 3*b*d*e
^2*x^4))/x^5 + a*e^3*x
```

sympy [A] time = 3.38, size = 289, normalized size = 1.63

$$\begin{cases} -\frac{ad^3}{5x^5}-\frac{ad^2e}{x^3}-\frac{3ade^2}{x}+ae^3x+\frac{bc^5d^3\log(x)}{5}-\frac{bc^5d^3\log\left(x^2+\frac{1}{c^2}\right)}{10}+\frac{bc^3d^3}{10x^2}-bc^3d^2e\log(x)+\frac{bc^3d^2e\log\left(x^2+\frac{1}{c^2}\right)}{2}-\frac{bcd^3}{20x^4}-\frac{bcd}{2x} \\ a\left(-\frac{d^3}{5x^5}-\frac{d^2e}{x^3}-\frac{3de^2}{x}+e^3x\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**6,x)
```

```
[Out] Piecewise((-a*d**3/(5*x**5) - a*d**2*e/x**3 - 3*a*d*e**2/x + a*e**3*x + b*c
**5*d**3*log(x)/5 - b*c**5*d**3*log(x**2 + c**(-2))/10 + b*c**3*d**3/(10*x*
```

```
*2) - b*c**3*d**2*e*log(x) + b*c**3*d**2*e*log(x**2 + c**(-2))/2 - b*c*d**3
/(20*x**4) - b*c*d**2*e/(2*x**2) + 3*b*c*d*e**2*log(x) - 3*b*c*d*e**2*log(x
**2 + c**(-2))/2 - b*d**3*atan(c*x)/(5*x**5) - b*d**2*e*atan(c*x)/x**3 - 3*
b*d*e**2*atan(c*x)/x + b*e**3*x*atan(c*x) - b*e**3*log(x**2 + c**(-2))/(2*c
), Ne(c, 0)), (a*(-d**3/(5*x**5) - d**2*e/x**3 - 3*d*e**2/x + e**3*x), True
))
```

3.1147 $\int \frac{(d+ex^2)^3 (a+b\tan^{-1}(cx))}{x^7} dx$

Optimal. Leaf size=228

$$-\frac{d^3 (a+b\tan^{-1}(cx))}{6x^6}-\frac{3d^2e (a+b\tan^{-1}(cx))}{4x^4}-\frac{3de^2 (a+b\tan^{-1}(cx))}{2x^2}+ae^3\log(x)-\frac{1}{6}bc^6d^3\tan^{-1}(cx)-\frac{bc^5d^3}{6x}+\frac{3}{4}$$

```
[Out] -1/30*b*c*d^3/x^5+1/18*b*c^3*d^3/x^3-1/4*b*c*d^2*e/x^3-1/6*b*c^5*d^3/x+3/4*
b*c^3*d^2*e/x-3/2*b*c*d*e^2/x-1/6*b*c^6*d^3*arctan(c*x)+3/4*b*c^4*d^2*e*arc
tan(c*x)-3/2*b*c^2*d*e^2*arctan(c*x)-1/6*d^3*(a+b*arctan(c*x))/x^6-3/4*d^2*
e*(a+b*arctan(c*x))/x^4-3/2*d*e^2*(a+b*arctan(c*x))/x^2+a*e^3*ln(x)+1/2*I*b
*e^3*polylog(2,-I*c*x)-1/2*I*b*e^3*polylog(2,I*c*x)
```

Rubi [A] time = 0.23, antiderivative size = 228, normalized size of antiderivative = 1.00, number of steps used = 17, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4980, 4852, 325, 203, 4848, 2391}

$$\frac{1}{2}ibe^3\text{PolyLog}(2,-icx)-\frac{1}{2}ibe^3\text{PolyLog}(2,icx)-\frac{3d^2e (a+b\tan^{-1}(cx))}{4x^4}-\frac{d^3 (a+b\tan^{-1}(cx))}{6x^6}-\frac{3de^2 (a+b\tan^{-1}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] -(b*c*d^3)/(30*x^5) + (b*c^3*d^3)/(18*x^3) - (b*c*d^2*e)/(4*x^3) - (b*c^5*d
^3)/(6*x) + (3*b*c^3*d^2*e)/(4*x) - (3*b*c*d*e^2)/(2*x) - (b*c^6*d^3*ArcTan
[c*x])/6 + (3*b*c^4*d^2*e*ArcTan[c*x])/4 - (3*b*c^2*d*e^2*ArcTan[c*x])/2 -
(d^3*(a + b*ArcTan[c*x]))/(6*x^6) - (3*d^2*e*(a + b*ArcTan[c*x]))/(4*x^4) -
 (3*d*e^2*(a + b*ArcTan[c*x]))/(2*x^2) + a*e^3*Log[x] + (I/2)*b*e^3*PolyLog
[2, (-I)*c*x] - (I/2)*b*e^3*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
```

```
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\tan^{-1}(cx))}{x^7}\,dx = \int \left(\frac{d^3(a+b\tan^{-1}(cx))}{x^7} + \frac{3d^2e(a+b\tan^{-1}(cx))}{x^5} + \frac{3de^2(a+b\tan^{-1}(cx))}{x^3}\right.$$

$$= d^3\int \frac{a+b\tan^{-1}(cx)}{x^7}\,dx + (3d^2e)\int \frac{a+b\tan^{-1}(cx)}{x^5}\,dx + (3de^2)\int \frac{a+b\,\mathrm{ta}}{x}$$

$$= -\frac{d^3(a+b\tan^{-1}(cx))}{6x^6} - \frac{3d^2e(a+b\tan^{-1}(cx))}{4x^4} - \frac{3de^2(a+b\tan^{-1}(cx))}{2x^2} + a$$

$$= -\frac{bcd^3}{30x^5} - \frac{bcd^2e}{4x^3} - \frac{3bcde^2}{2x} - \frac{d^3(a+b\tan^{-1}(cx))}{6x^6} - \frac{3d^2e(a+b\tan^{-1}(cx))}{4x^4} -$$

$$= -\frac{bcd^3}{30x^5} + \frac{bc^3d^3}{18x^3} - \frac{bcd^2e}{4x^3} + \frac{3bc^3d^2e}{4x} - \frac{3bcde^2}{2x} - \frac{3}{2}bc^2de^2\tan^{-1}(cx) - \frac{d^3(a+}{}$$

$$= -\frac{bcd^3}{30x^5} + \frac{bc^3d^3}{18x^3} - \frac{bcd^2e}{4x^3} - \frac{bc^5d^3}{6x} + \frac{3bc^3d^2e}{4x} - \frac{3bcde^2}{2x} + \frac{3}{4}bc^4d^2e\tan^{-1}(cx) -$$

$$= -\frac{bcd^3}{30x^5} + \frac{bc^3d^3}{18x^3} - \frac{bcd^2e}{4x^3} - \frac{bc^5d^3}{6x} + \frac{3bc^3d^2e}{4x} - \frac{3bcde^2}{2x} - \frac{1}{6}bc^6d^3\tan^{-1}(cx) +$$

Mathematica [C] time = 0.15, size = 175, normalized size = 0.77

$$\frac{1}{60}\left(-\frac{10d^3(a+b\tan^{-1}(cx))}{x^6} - \frac{45d^2e(a+b\tan^{-1}(cx))}{x^4} - \frac{90de^2(a+b\tan^{-1}(cx))}{x^2} + 60ae^3\log(x) - \frac{2bcd^3\,{}_2F_1\left(-\frac{5}{2}\right.}{x}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^7,x]
```

```
[Out] ((-10*d^3*(a + b*ArcTan[c*x]))/x^6 - (45*d^2*e*(a + b*ArcTan[c*x]))/x^4 - (
90*d*e^2*(a + b*ArcTan[c*x]))/x^2 - (2*b*c*d^3*Hypergeometric2F1[-5/2, 1, -
3/2, -(c^2*x^2)])/x^5 - (15*b*c*d^2*e*Hypergeometric2F1[-3/2, 1, -1/2, -(c^
2*x^2)])/x^3 - (90*b*c*d*e^2*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*x^2)])/x
 + 60*a*e^3*Log[x] + (30*I)*b*e^3*PolyLog[2, (-I)*c*x] - (30*I)*b*e^3*PolyL
og[2, I*c*x])/60
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{ae^3x^6 + 3\,ade^2x^4 + 3\,ad^2ex^2 + ad^3 + (be^3x^6 + 3\,bde^2x^4 + 3\,bd^2ex^2 + bd^3)\arctan(cx)}{x^7}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^7,x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arctan(c*x))/x^7, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^7,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.07, size = 272, normalized size = 1.19

$$a e^{3} \ln (cx)-\frac{3a\, d^{2} e}{4x^{4}}-\frac{a\, d^{3}}{6x^{6}}-\frac{3ad\, e^{2}}{2x^{2}}+b \arctan (cx) e^{3} \ln (cx)-\frac{3b \arctan (cx) d^{2} e}{4x^{4}}-\frac{b \arctan (cx) d^{3}}{6x^{6}}-\frac{3b \arctan (cx)}{2x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^7,x)
```

```
[Out] a*e^3*ln(c*x)-3/4*a*d^2*e/x^4-1/6*a*d^3/x^6-3/2*a*d*e^2/x^2+b*arctan(c*x)*e
^3*ln(c*x)-3/4*b*arctan(c*x)*d^2*e/x^4-1/6*b*arctan(c*x)*d^3/x^6-3/2*b*arct
an(c*x)*d*e^2/x^2+1/2*I*b*e^3*dilog(1+I*c*x)-1/2*I*b*e^3*dilog(1-I*c*x)+1/2
*I*b*e^3*ln(c*x)*ln(1+I*c*x)-1/2*I*b*e^3*ln(c*x)*ln(1-I*c*x)-1/6*b*c^5*d^3/
x+3/4*b*c^3*d^2*e/x-3/2*b*c*d*e^2/x-1/30*b*c*d^3/x^5+1/18*b*c^3*d^3/x^3-1/4
*b*c*d^2*e/x^3-1/6*b*c^6*d^3*arctan(c*x)+3/4*b*c^4*d^2*e*arctan(c*x)-3/2*b*
c^2*d*e^2*arctan(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{90}\left(\left(15\, c^{5} \arctan (cx)+\frac{15\, c^{4} x^{4}-5\, c^{2} x^{2}+3}{x^{5}}\right) c+\frac{15 \arctan (cx)}{x^{6}}\right) b d^{3}+\frac{1}{4}\left(\left(3\, c^{3} \arctan (cx)+\frac{3\, c^{2} x^{2}-1}{x^{3}}\right) c-\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^7,x, algorithm="maxima")
```

```
[Out] -1/90*((15*c^5*arctan(c*x) + (15*c^4*x^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arcta
n(c*x)/x^6)*b*d^3 + 1/4*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*ar
ctan(c*x)/x^4)*b*d^2*e - 3/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*
d*e^2 + b*e^3*integrate(arctan(c*x)/x, x) + a*e^3*log(x) - 3/2*a*d*e^2/x^2
- 3/4*a*d^2*e/x^4 - 1/6*a*d^3/x^6
```

mupad [B] time = 0.84, size = 261, normalized size = 1.14

$$\begin{cases} a\, e^{3} \ln(x)-\frac{\frac{a\, d^{3}}{6}+\frac{3\, a\, d^{2}\, e\, x^{2}}{4}+\frac{3\, a\, d\, e^{2}\, x^{4}}{2}}{x^{6}} \\ a\, e^{3} \ln(x)-\frac{\frac{a\, d^{3}}{6}+\frac{3\, a\, d^{2}\, e\, x^{2}}{4}+\frac{3\, a\, d\, e^{2}\, x^{4}}{2}}{x^{6}}-3\, b\, d^{2}\, e\left(\frac{\mathrm{atan}(c\, x)}{4\, x^{4}}+\frac{\frac{\frac{c^{2}}{3}-c^{4}\, x^{2}}{x^{3}}-c^{5}\,\mathrm{atan}(c\, x)}{4\, c}\right)-\frac{b\, d^{3}\left(\frac{c^{6}\, x^{4}-\frac{c^{4}\, x^{2}}{3}+\frac{c^{2}}{5}}{x^{5}}+c^{7}\,\mathrm{atan}(c\, x)\right)}{6\, c}-3\, b\, d\, e \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^7,x)
```

```
[Out] piecewise(c == 0, - ((a*d^3)/6 + (3*a*d^2*e*x^2)/4 + (3*a*d*e^2*x^4)/2)/x^6
 + a*e^3*log(x), c ~= 0, - ((a*d^3)/6 + (3*a*d^2*e*x^2)/4 + (3*a*d*e^2*x^4)
```

```
/2)/x^6 + a*e^3*log(x) - (b*e^3*dilog(- c*x*1i + 1)*1i)/2 + (b*e^3*dilog(c*
x*1i + 1)*1i)/2 - 3*b*d^2*e*(atan(c*x)/(4*x^4) + ((c^2/3 - c^4*x^2)/x^3 - c
^5*atan(c*x))/(4*c)) - (b*d^3*((c^2/5 - (c^4*x^2)/3 + c^6*x^4)/x^5 + c^7*at
an(c*x)))/(6*c) - 3*b*d*e^2*((c^3*atan(c*x) + c^2/x)/(2*c) + atan(c*x)/(2*x
^2)) - (b*d^3*atan(c*x))/(6*x^6))
```

sympy [**F**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))\left(d + ex^2\right)^3}{x^7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**7,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**3/x**7, x)
```

3.1148 $\int \frac{\left(d+ex^2\right)^3\left(a+b\tan^{-1}(cx)\right)}{x^8}\,dx$

Optimal. Leaf size=224

$$-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{7x^7}-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{de^2\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{e^3\left(a+b\tan^{-1}(cx)\right)}{x}+\frac{bcd^2\left(5c^2d-21e\right)}{140x^4}$$

```
[Out] -1/42*b*c*d^3/x^6+1/140*b*c*d^2*(5*c^2*d-21*e)/x^4-1/70*b*c*d*(5*c^4*d^2-21
*c^2*d*e+35*e^2)/x^2-1/7*d^3*(a+b*arctan(c*x))/x^7-3/5*d^2*e*(a+b*arctan(c*
x))/x^5-d*e^2*(a+b*arctan(c*x))/x^3-e^3*(a+b*arctan(c*x))/x-1/35*b*c*(5*c^6
*d^3-21*c^4*d^2*e+35*c^2*d*e^2-35*e^3)*ln(x)+1/70*b*c*(5*c^6*d^3-21*c^4*d^2
*e+35*c^2*d*e^2-35*e^3)*ln(c^2*x^2+1)
```

Rubi [A] time = 0.33, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {270, 4976, 12, 1799, 1620}

$$-\frac{3d^2e\left(a+b\tan^{-1}(cx)\right)}{5x^5}-\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{7x^7}-\frac{de^2\left(a+b\tan^{-1}(cx)\right)}{x^3}-\frac{e^3\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{bcd\left(5c^4d^2-21c^2d\right.}{70x^2}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^8,x]
```

```
[Out] -(b*c*d^3)/(42*x^6) + (b*c*d^2*(5*c^2*d - 21*e))/(140*x^4) - (b*c*d*(5*c^4*
d^2 - 21*c^2*d*e + 35*e^2))/(70*x^2) - (d^3*(a + b*ArcTan[c*x]))/(7*x^7) -
(3*d^2*e*(a + b*ArcTan[c*x]))/(5*x^5) - (d*e^2*(a + b*ArcTan[c*x]))/x^3 - (
e^3*(a + b*ArcTan[c*x]))/x - (b*c*(5*c^6*d^3 - 21*c^4*d^2*e + 35*c^2*d*e^2
- 35*e^3)*Log[x])/35 + (b*c*(5*c^6*d^3 - 21*c^4*d^2*e + 35*c^2*d*e^2 - 35*e
^3)*Log[1 + c^2*x^2])/70
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 1620

```
Int[(Px_)*((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol]
:> Int[ExpandIntegrand[Px*(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c
, d, m, n}, x] && PolyQ[Px, x] && (IntegersQ[m, n] || IGtQ[m, -2]) && GtQ[E
xpon[Px, x], 2]
```

Rule 1799

```
Int[(Pq_)*(x_)^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Dist[1/2, Su
bst[Int[x^((m - 1)/2)*SubstFor[x^2, Pq, x]*(a + b*x)^p, x], x, x^2], x] /;
FreeQ[{a, b, p}, x] && PolyQ[Pq, x^2] && IntegerQ[(m - 1)/2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
```

```
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{(d+ex^2)^3 (a+b\tan^{-1}(cx))}{x^8}\,dx = -\frac{d^3(a+b\tan^{-1}(cx))}{7x^7} - \frac{3d^2e(a+b\tan^{-1}(cx))}{5x^5} - \frac{de^2(a+b\tan^{-1}(cx))}{x^3} - \frac{e^3}{}$$

$$= -\frac{d^3(a+b\tan^{-1}(cx))}{7x^7} - \frac{3d^2e(a+b\tan^{-1}(cx))}{5x^5} - \frac{de^2(a+b\tan^{-1}(cx))}{x^3} - \frac{e^3}{}$$

$$= -\frac{d^3(a+b\tan^{-1}(cx))}{7x^7} - \frac{3d^2e(a+b\tan^{-1}(cx))}{5x^5} - \frac{de^2(a+b\tan^{-1}(cx))}{x^3} - \frac{e^3}{}$$

$$= -\frac{d^3(a+b\tan^{-1}(cx))}{7x^7} - \frac{3d^2e(a+b\tan^{-1}(cx))}{5x^5} - \frac{de^2(a+b\tan^{-1}(cx))}{x^3} - \frac{e^3}{}$$

$$= -\frac{bcd^3}{42x^6} + \frac{bcd^2(5c^2d-21e)}{140x^4} - \frac{bcd(5c^4d^2-21c^2de+35e^2)}{70x^2} - \frac{d^3(a+b\tan^{-1}}{7x^7}$$

Mathematica [A] time = 0.18, size = 230, normalized size = 1.03

$$-\frac{d^3(a+b\tan^{-1}(cx))}{7x^7} - \frac{3d^2e(a+b\tan^{-1}(cx))}{5x^5} - \frac{de^2(a+b\tan^{-1}(cx))}{x^3} - \frac{e^3(a+b\tan^{-1}(cx))}{x} - \frac{1}{2}bcde^2\left(-c^2\log(c^2x^2\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^8,x]
```

```
[Out] -1/7*(d^3*(a + b*ArcTan[c*x]))/x^7 - (3*d^2*e*(a + b*ArcTan[c*x]))/(5*x^5)
- (d*e^2*(a + b*ArcTan[c*x]))/x^3 - (e^3*(a + b*ArcTan[c*x]))/x + (b*c*e^3*
(2*Log[x] - Log[1 + c^2*x^2]))/2 - (b*c*d*e^2*(x^(-2) + 2*c^2*Log[x] - c^2*
Log[1 + c^2*x^2]))/2 - (3*b*c*d^2*e*(x^(-4) - (2*c^2)/x^2 - 4*c^4*Log[x] +
2*c^4*Log[1 + c^2*x^2]))/20 - (b*c*d^3*(2/x^6 - (3*c^2)/x^4 + (6*c^4)/x^2 +
 12*c^6*Log[x] - 6*c^6*Log[1 + c^2*x^2]))/84
```

fricas [A] time = 0.50, size = 243, normalized size = 1.08

$$-\frac{420\,ae^3x^6 - 6\left(5\,bc^7d^3 - 21\,bc^5d^2e + 35\,bc^3de^2 - 35\,bce^3\right)x^7\log\left(c^2x^2+1\right) + 12\left(5\,bc^7d^3 - 21\,bc^5d^2e + 35\,bc^3de^2\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^8,x, algorithm="fricas")
```

```
[Out] -1/420*(420*a*e^3*x^6 - 6*(5*b*c^7*d^3 - 21*b*c^5*d^2*e + 35*b*c^3*d*e^2 -
35*b*c*e^3)*x^7*log(c^2*x^2 + 1) + 12*(5*b*c^7*d^3 - 21*b*c^5*d^2*e + 35*b*
c^3*d*e^2 - 35*b*c*e^3)*x^7*log(x) + 420*a*d*e^2*x^4 + 10*b*c*d^3*x + 252*a
*d^2*e*x^2 + 6*(5*b*c^5*d^3 - 21*b*c^3*d^2*e + 35*b*c*d*e^2)*x^5 + 60*a*d^3
 - 3*(5*b*c^3*d^3 - 21*b*c*d^2*e)*x^3 + 12*(35*b*e^3*x^6 + 35*b*d*e^2*x^4 +
 21*b*d^2*e*x^2 + 5*b*d^3)*arctan(c*x))/x^7
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^8,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 0.05, size = 290, normalized size = 1.29

$$-\frac{a\,d^{3}}{7x^{7}}-\frac{ad\,e^{2}}{x^{3}}-\frac{a\,e^{3}}{x}-\frac{3a\,d^{2}e}{5x^{5}}-\frac{b\arctan\left(cx\right)d^{3}}{7x^{7}}-\frac{b\arctan\left(cx\right)d\,e^{2}}{x^{3}}-\frac{b\arctan\left(cx\right)e^{3}}{x}-\frac{3b\arctan\left(cx\right)d^{2}e}{5x^{5}}-\frac{c^{7}b\,d^{3}\ln}{7}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^8,x)
```

```
[Out] -1/7*a*d^3/x^7-a*d*e^2/x^3-a*e^3/x-3/5*a*d^2*e/x^5-1/7*b*arctan(c*x)*d^3/x^
7-b*arctan(c*x)*d*e^2/x^3-b*arctan(c*x)*e^3/x-3/5*b*arctan(c*x)*d^2*e/x^5-1
/7*c^7*b*d^3*ln(c*x)+3/5*c^5*b*ln(c*x)*d^2*e-c^3*b*ln(c*x)*d*e^2+c*b*ln(c*x
)*e^3+1/28*c^3*b*d^3/x^4-3/20*c*b*d^2*e/x^4-1/42*b*c*d^3/x^6-1/14*c^5*b*d^3
/x^2+3/10*c^3*b*d^2*e/x^2-1/2*c*b*d*e^2/x^2+1/14*c^7*b*ln(c^2*x^2+1)*d^3-3/
10*c^5*b*ln(c^2*x^2+1)*d^2*e+1/2*c^3*b*ln(c^2*x^2+1)*d*e^2-1/2*c*b*ln(c^2*x
^2+1)*e^3
```

maxima [A] time = 0.34, size = 247, normalized size = 1.10

$$\frac{1}{84}\left(\left(6\,c^{6}\log\left(c^{2}x^{2}+1\right)-6\,c^{6}\log\left(x^{2}\right)-\frac{6\,c^{4}x^{4}-3\,c^{2}x^{2}+2}{x^{6}}\right)c-\frac{12\arctan\left(cx\right)}{x^{7}}\right)bd^{3}-\frac{3}{20}\left(\left(2\,c^{4}\log\left(c^{2}x^{2}+1\right)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^8,x, algorithm="maxima")
```

```
[Out] 1/84*((6*c^6*log(c^2*x^2 + 1) - 6*c^6*log(x^2) - (6*c^4*x^4 - 3*c^2*x^2 + 2
)/x^6)*c - 12*arctan(c*x)/x^7)*b*d^3 - 3/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^
4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*c + 4*arctan(c*x)/x^5)*b*d^2*e + 1/2*((c^
2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b*d*e^2 -
 1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*e^3 - a*e^3/x -
a*d*e^2/x^3 - 3/5*a*d^2*e/x^5 - 1/7*a*d^3/x^7
```

mupad [B] time = 0.69, size = 236, normalized size = 1.05

$$\ln\left(c^{2}\,x^{2}+1\right)\left(\frac{b\,c^{7}\,d^{3}}{14}-\frac{3\,b\,c^{5}\,d^{2}\,e}{10}+\frac{b\,c^{3}\,d\,e^{2}}{2}-\frac{b\,c\,e^{3}}{2}\right)-\ln(x)\left(\frac{b\,c^{7}\,d^{3}}{7}-\frac{3\,b\,c^{5}\,d^{2}\,e}{5}+b\,c^{3}\,d\,e^{2}-b\,c\,e^{3}\right)-\frac{5\,a\,d^{3}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^8,x)
```

```
[Out] log(c^2*x^2 + 1)*((b*c^7*d^3)/14 - (b*c*e^3)/2 + (b*c^3*d*e^2)/2 - (3*b*c^5
*d^2*e)/10) - log(x)*((b*c^7*d^3)/7 - b*c*e^3 + b*c^3*d*e^2 - (3*b*c^5*d^2*
e)/5) - (5*a*d^3 - x^3*((5*b*c^3*d^3)/4 - (21*b*c*d^2*e)/4) + x^5*((5*b*c^5
*d^3)/2 + (35*b*c*d*e^2)/2 - (21*b*c^3*d^2*e)/2) + 35*a*e^3*x^6 + (5*b*c*d^
3*x)/6 + 21*a*d^2*e*x^2 + 35*a*d*e^2*x^4)/(35*x^7) - (atan(c*x)*((b*d^3)/7
+ b*e^3*x^6 + (3*b*d^2*e*x^2)/5 + b*d*e^2*x^4))/x^7
```

sympy [A] time = 4.42, size = 362, normalized size = 1.62

$$\begin{cases} -\frac{ad^{3}}{7x^{7}}-\frac{3ad^{2}e}{5x^{5}}-\frac{ade^{2}}{x^{3}}-\frac{ae^{3}}{x}-\frac{bc^{7}d^{3}\log\left(x\right)}{7}+\frac{bc^{7}d^{3}\log\left(x^{2}+\frac{1}{c^{2}}\right)}{14}-\frac{bc^{5}d^{3}}{14x^{2}}+\frac{3bc^{5}d^{2}e\log\left(x\right)}{5}-\frac{3bc^{5}d^{2}e\log\left(x^{2}+\frac{1}{c^{2}}\right)}{10}+\frac{bc^{3}d^{3}}{28x^{4}}+\frac{3bc^{3}d^{2}}{10x^{2}} \\ a\left(-\frac{d^{3}}{7x^{7}}-\frac{3d^{2}e}{5x^{5}}-\frac{de^{2}}{x^{3}}-\frac{e^{3}}{x}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**8,x)
```

```
[Out] Piecewise((-a*d**3/(7*x**7) - 3*a*d**2*e/(5*x**5) - a*d*e**2/x**3 - a*e**3/
x - b*c**7*d**3*log(x)/7 + b*c**7*d**3*log(x**2 + c**(-2))/14 - b*c**5*d**3
/(14*x**2) + 3*b*c**5*d**2*e*log(x)/5 - 3*b*c**5*d**2*e*log(x**2 + c**(-2))
/10 + b*c**3*d**3/(28*x**4) + 3*b*c**3*d**2*e/(10*x**2) - b*c**3*d*e**2*log
(x) + b*c**3*d*e**2*log(x**2 + c**(-2))/2 - b*c*d**3/(42*x**6) - 3*b*c*d**2
*e/(20*x**4) - b*c*d*e**2/(2*x**2) + b*c*e**3*log(x) - b*c*e**3*log(x**2 +
c**(-2))/2 - b*d**3*atan(c*x)/(7*x**7) - 3*b*d**2*e*atan(c*x)/(5*x**5) - b*
d*e**2*atan(c*x)/x**3 - b*e**3*atan(c*x)/x, Ne(c, 0)), (a*(-d**3/(7*x**7) -
 3*d**2*e/(5*x**5) - d*e**2/x**3 - e**3/x), True))
```

3.1149 $\int \frac{(d+ex^2)^3(a+b\tan^{-1}(cx))}{x^9}\,dx$

Optimal. Leaf size=152

$$-\frac{(d+ex^2)^4(a+b\tan^{-1}(cx))}{8dx^8}+\frac{bcd^2(c^2d-4e)}{40x^5}+\frac{b(c^2d-e)^4\tan^{-1}(cx)}{8d}-\frac{bcd(c^4d^2-4c^2de+6e^2)}{24x^3}+\frac{bc(c^2d-2e}{}$$

```
[Out] -1/56*b*c*d^3/x^7+1/40*b*c*d^2*(c^2*d-4*e)/x^5-1/24*b*c*d*(c^4*d^2-4*c^2*d*
e+6*e^2)/x^3+1/8*b*c*(c^2*d-2*e)*(c^4*d^2-2*c^2*d*e+2*e^2)/x+1/8*b*(c^2*d-e
)^4*arctan(c*x)/d-1/8*(e*x^2+d)^4*(a+b*arctan(c*x))/d/x^8
```

Rubi [A] time = 0.20, antiderivative size = 152, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.238$, Rules used = {264, 4976, 12, 461, 203}

$$-\frac{(d+ex^2)^4(a+b\tan^{-1}(cx))}{8dx^8}-\frac{bcd(c^4d^2-4c^2de+6e^2)}{24x^3}+\frac{bc(c^2d-2e)(c^4d^2-2c^2de+2e^2)}{8x}+\frac{bcd^2(c^2d-4e)}{40x^5}+$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^9,x]
```

```
[Out] -(b*c*d^3)/(56*x^7) + (b*c*d^2*(c^2*d - 4*e))/(40*x^5) - (b*c*d*(c^4*d^2 -
4*c^2*d*e + 6*e^2))/(24*x^3) + (b*c*(c^2*d - 2*e)*(c^4*d^2 - 2*c^2*d*e + 2*
e^2))/(8*x) + (b*(c^2*d - e)^4*ArcTan[c*x])/(8*d) - ((d + e*x^2)^4*(a + b*A
rcTan[c*x]))/(8*d*x^8)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 461

```
Int[(((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_))/((c_) + (d_.)*(x_)^(
n_)), x_Symbol] :> Int[ExpandIntegrand[((e*x)^m*(a + b*x^n)^p)/(c + d*x^n),
 x], x] /; FreeQ[{a, b, c, d, e, m}, x] && NeQ[b*c - a*d, 0] && IGtQ[n, 0]
&& IGtQ[p, 0] && (IntegerQ[m] || IGtQ[2*(m + 1), 0] ||  !RationalQ[m])
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
```

```
- 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^3 \left(a+b\tan^{-1}(cx)\right)}{x^9}\,dx = -\frac{\left(d+ex^2\right)^4 \left(a+b\tan^{-1}(cx)\right)}{8dx^8} - (bc)\int \frac{\left(d+ex^2\right)^4}{8x^8\left(-d-c^2dx^2\right)}\,dx$$

$$= -\frac{\left(d+ex^2\right)^4 \left(a+b\tan^{-1}(cx)\right)}{8dx^8} - \frac{1}{8}(bc)\int \frac{\left(d+ex^2\right)^4}{x^8\left(-d-c^2dx^2\right)}\,dx$$

$$= -\frac{\left(d+ex^2\right)^4 \left(a+b\tan^{-1}(cx)\right)}{8dx^8} - \frac{1}{8}(bc)\int \left(-\frac{d^3}{x^8} + \frac{d^2\left(c^2d-4e\right)}{x^6} - \frac{d\left(c^4d^2-\right.}{}\right.$$

$$= -\frac{bcd^3}{56x^7} + \frac{bcd^2\left(c^2d-4e\right)}{40x^5} - \frac{bcd\left(c^4d^2-4c^2de+6e^2\right)}{24x^3} + \frac{bc\left(c^2d-2e\right)\left(c^4d^2-\right.}{8x}$$

$$= -\frac{bcd^3}{56x^7} + \frac{bcd^2\left(c^2d-4e\right)}{40x^5} - \frac{bcd\left(c^4d^2-4c^2de+6e^2\right)}{24x^3} + \frac{bc\left(c^2d-2e\right)\left(c^4d^2-\right.}{8x}$$

Mathematica [C] time = 0.19, size = 154, normalized size = 1.01

$$-\frac{35\left(\left(d^3+4d^2ex^2+6de^2x^4+4e^3x^6\right)\left(a+b\tan^{-1}(cx)\right)+2bcde^2x^5\,{}_2F_1\left(-\frac{3}{2},1;-\frac{1}{2};-c^2x^2\right)+4bce^3x^7\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};\right.\right.}{280x^8}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^3*(a + b*ArcTan[c*x]))/x^9,x]
```

```
[Out] -1/280*(5*b*c*d^3*x*Hypergeometric2F1[-7/2, 1, -5/2, -(c^2*x^2)] + 28*b*c*d
^2*e*x^3*Hypergeometric2F1[-5/2, 1, -3/2, -(c^2*x^2)] + 35*((d^3 + 4*d^2*e*
x^2 + 6*d*e^2*x^4 + 4*e^3*x^6)*(a + b*ArcTan[c*x]) + 2*b*c*d*e^2*x^5*Hyperg
eometric2F1[-3/2, 1, -1/2, -(c^2*x^2)] + 4*b*c*e^3*x^7*Hypergeometric2F1[-1
/2, 1, 1/2, -(c^2*x^2)]))/x^8
```

fricas [A] time = 0.43, size = 228, normalized size = 1.50

$$-\frac{420\,ae^3x^6+630\,ade^2x^4-105\left(bc^7d^3-4\,bc^5d^2e+6\,bc^3de^2-4\,bce^3\right)x^7+15\,bcd^3x+420\,ad^2ex^2+35\left(bc^5d^3-4\,\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^9,x, algorithm="fricas")
```

```
[Out] -1/840*(420*a*e^3*x^6 + 630*a*d*e^2*x^4 - 105*(b*c^7*d^3 - 4*b*c^5*d^2*e +
6*b*c^3*d*e^2 - 4*b*c*e^3)*x^7 + 15*b*c*d^3*x + 420*a*d^2*e*x^2 + 35*(b*c^5
*d^3 - 4*b*c^3*d^2*e + 6*b*c*d*e^2)*x^5 + 105*a*d^3 - 21*(b*c^3*d^3 - 4*b*c
*d^2*e)*x^3 + 105*(4*b*e^3*x^6 - (b*c^8*d^3 - 4*b*c^6*d^2*e + 6*b*c^4*d*e^2
 - 4*b*c^2*e^3)*x^8 + 6*b*d*e^2*x^4 + 4*b*d^2*e*x^2 + b*d^3)*arctan(c*x))/x
^8
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^9,x, algorithm="giac")
```

[Out] Timed out

maple [A] time = 0.05, size = 265, normalized size = 1.74

$$-\frac{a\,d^3}{8x^8}-\frac{3ad\,e^2}{4x^4}-\frac{a\,d^2e}{2x^6}-\frac{a\,e^3}{2x^2}-\frac{b\arctan\left(cx\right)d^3}{8x^8}-\frac{3b\arctan\left(cx\right)d\,e^2}{4x^4}-\frac{b\arctan\left(cx\right)d^2e}{2x^6}-\frac{b\arctan\left(cx\right)e^3}{2x^2}+\frac{c^7b\,d^3}{8x}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^3*(a+b*arctan(c*x))/x^9,x)
```

```
[Out] -1/8*a*d^3/x^8-3/4*a*d*e^2/x^4-1/2*a*d^2*e/x^6-1/2*a*e^3/x^2-1/8*b*arctan(c
*x)*d^3/x^8-3/4*b*arctan(c*x)*d*e^2/x^4-1/2*b*arctan(c*x)*d^2*e/x^6-1/2*b*a
rctan(c*x)*e^3/x^2+1/8*c^7*b*d^3/x-1/2*c^5*b*d^2*e/x+3/4*c^3*b*d*e^2/x-1/2*
c*b*e^3/x+1/40*c^3*b*d^3/x^5-1/10*c*b*d^2*e/x^5-1/56*b*c*d^3/x^7-1/24*c^5*b
*d^3/x^3+1/6*c^3*b*d^2*e/x^3-1/4*c*b*d*e^2/x^3+1/8*c^8*b*arctan(c*x)*d^3-1/
2*c^6*b*arctan(c*x)*d^2*e+3/4*c^4*b*arctan(c*x)*d*e^2-1/2*c^2*b*arctan(c*x)
*e^3
```

maxima [A] time = 0.43, size = 218, normalized size = 1.43

$$\frac{1}{840}\left(\left(105\,c^7\arctan\left(cx\right)+\frac{105\,c^6x^6-35\,c^4x^4+21\,c^2x^2-15}{x^7}\right)c-\frac{105\,\arctan\left(cx\right)}{x^8}\right)bd^3-\frac{1}{30}\left(\left(15\,c^5\arctan\left(cx\right)\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^3*(a+b*arctan(c*x))/x^9,x, algorithm="maxima")
```

```
[Out] 1/840*((105*c^7*arctan(c*x) + (105*c^6*x^6 - 35*c^4*x^4 + 21*c^2*x^2 - 15)/
x^7)*c - 105*arctan(c*x)/x^8)*b*d^3 - 1/30*((15*c^5*arctan(c*x) + (15*c^4*x
^4 - 5*c^2*x^2 + 3)/x^5)*c + 15*arctan(c*x)/x^6)*b*d^2*e + 1/4*((3*c^3*arct
an(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*d*e^2 - 1/2*((c*arc
tan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*e^3 - 1/2*a*e^3/x^2 - 3/4*a*d*e^2/x^
4 - 1/2*a*d^2*e/x^6 - 1/8*a*d^3/x^8
```

mupad [B] time = 0.63, size = 301, normalized size = 1.98

$$\frac{b\,c^2\,\mathrm{atan}\left(\frac{b\,c^2\,x\,\left(2\,e-c^2\,d\right)\,\left(c^4\,d^2-2\,c^2\,d\,e+2\,e^2\right)}{b\,c^7\,d^3-4\,b\,c^5\,d^2\,e+6\,b\,c^3\,d\,e^2-4\,b\,c\,e^3}\right)\,\left(2\,e-c^2\,d\right)\,\left(c^4\,d^2-2\,c^2\,d\,e+2\,e^2\right)}{8}-\frac{\mathrm{atan}\left(c\,x\right)\,\left(\frac{b\,d^3}{8}+\frac{b\,d^2\,e\,x^2}{2}+\frac{3\,b\,d\,e^2\,x^4}{4}\right.}{x^8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^3)/x^9,x)
```

```
[Out] (b*c^2*atan((b*c^2*x*(2*e - c^2*d)*(2*e^2 + c^4*d^2 - 2*c^2*d*e))/(b*c^7*d^
3 - 4*b*c*e^3 + 6*b*c^3*d*e^2 - 4*b*c^5*d^2*e))*(2*e - c^2*d)*(2*e^2 + c^4*
d^2 - 2*c^2*d*e))/8 - (atan(c*x)*((b*d^3)/8 + (b*e^3*x^6)/2 + (b*d^2*e*x^2)
/2 + (3*b*d*e^2*x^4)/4))/x^8 - (a*d^3 - x^3*((b*c^3*d^3)/5 - (4*b*c*d^2*e)/
5) - x^7*(b*c^7*d^3 - 4*b*c*e^3 + 6*b*c^3*d*e^2 - 4*b*c^5*d^2*e) + x^5*((b*
c^5*d^3)/3 + 2*b*c*d*e^2 - (4*b*c^3*d^2*e)/3) + 4*a*e^3*x^6 + (b*c*d^3*x)/7
 + 4*a*d^2*e*x^2 + 6*a*d*e^2*x^4)/(8*x^8)
```

sympy [B] time = 3.16, size = 309, normalized size = 2.03

$$-\frac{ad^3}{8x^8}-\frac{ad^2e}{2x^6}-\frac{3ade^2}{4x^4}-\frac{ae^3}{2x^2}+\frac{bc^8d^3\,\mathrm{atan}\left(cx\right)}{8}+\frac{bc^7d^3}{8x}-\frac{bc^6d^2e\,\mathrm{atan}\left(cx\right)}{2}-\frac{bc^5d^3}{24x^3}-\frac{bc^5d^2e}{2x}+\frac{3bc^4de^2\,\mathrm{atan}\left(cx\right)}{4}+\frac{bc^3d^3}{40x^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**3*(a+b*atan(c*x))/x**9,x)
```

```
[Out] -a*d**3/(8*x**8) - a*d**2*e/(2*x**6) - 3*a*d*e**2/(4*x**4) - a*e**3/(2*x**2
) + b*c**8*d**3*atan(c*x)/8 + b*c**7*d**3/(8*x) - b*c**6*d**2*e*atan(c*x)/2
 - b*c**5*d**3/(24*x**3) - b*c**5*d**2*e/(2*x) + 3*b*c**4*d*e**2*atan(c*x)/
4 + b*c**3*d**3/(40*x**5) + b*c**3*d**2*e/(6*x**3) + 3*b*c**3*d*e**2/(4*x)
- b*c**2*e**3*atan(c*x)/2 - b*c*d**3/(56*x**7) - b*c*d**2*e/(10*x**5) - b*c
*d*e**2/(4*x**3) - b*c*e**3/(2*x) - b*d**3*atan(c*x)/(8*x**8) - b*d**2*e*at
an(c*x)/(2*x**6) - 3*b*d*e**2*atan(c*x)/(4*x**4) - b*e**3*atan(c*x)/(2*x**2
)
```

3.1150 $\int \left(c+dx^2\right)^4 \tan^{-1}(ax)\,dx$

Optimal. Leaf size=244

$$-\frac{d^3x^6\left(36a^2c-7d\right)}{378a^3}-\frac{d^2x^4\left(378a^4c^2-180a^2cd+35d^2\right)}{1260a^5}-\frac{dx^2\left(420a^6c^3-378a^4c^2d+180a^2cd^2-35d^3\right)}{630a^7}-\frac{(315a^8}{}$$

```
[Out] -1/630*d*(420*a^6*c^3-378*a^4*c^2*d+180*a^2*c*d^2-35*d^3)*x^2/a^7-1/1260*d^
2*(378*a^4*c^2-180*a^2*c*d+35*d^2)*x^4/a^5-1/378*(36*a^2*c-7*d)*d^3*x^6/a^3
-1/72*d^4*x^8/a+c^4*x*arctan(a*x)+4/3*c^3*d*x^3*arctan(a*x)+6/5*c^2*d^2*x^5
*arctan(a*x)+4/7*c*d^3*x^7*arctan(a*x)+1/9*d^4*x^9*arctan(a*x)-1/630*(315*a
^8*c^4-420*a^6*c^3*d+378*a^4*c^2*d^2-180*a^2*c*d^3+35*d^4)*ln(a^2*x^2+1)/a^
9
```

Rubi [A] time = 0.18, antiderivative size = 244, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 14, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {194, 4912, 1810, 260}

$$-\frac{d^2x^4\left(378a^4c^2-180a^2cd+35d^2\right)}{1260a^5}-\frac{dx^2\left(-378a^4c^2d+420a^6c^3+180a^2cd^2-35d^3\right)}{630a^7}-\frac{\left(378a^4c^2d^2-420a^6c^3d\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(c + d*x^2)^4*ArcTan[a*x],x]
```

```
[Out] -(d*(420*a^6*c^3 - 378*a^4*c^2*d + 180*a^2*c*d^2 - 35*d^3)*x^2)/(630*a^7) -
 (d^2*(378*a^4*c^2 - 180*a^2*c*d + 35*d^2)*x^4)/(1260*a^5) - ((36*a^2*c - 7
*d)*d^3*x^6)/(378*a^3) - (d^4*x^8)/(72*a) + c^4*x*ArcTan[a*x] + (4*c^3*d*x^
3*ArcTan[a*x])/3 + (6*c^2*d^2*x^5*ArcTan[a*x])/5 + (4*c*d^3*x^7*ArcTan[a*x]
)/7 + (d^4*x^9*ArcTan[a*x])/9 - ((315*a^8*c^4 - 420*a^6*c^3*d + 378*a^4*c^2
*d^2 - 180*a^2*c*d^3 + 35*d^4)*Log[1 + a^2*x^2])/(630*a^9)
```

Rule 194

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Int[ExpandIntegrand[(a + b*
x^n)^p, x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && IGtQ[p, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 1810

```
Int[(Pq_)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[ExpandIntegrand[Pq*
(a + b*x^2)^p, x], x] /; FreeQ[{a, b}, x] && PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rubi steps

$$\int \left(c+dx^2\right)^4 \tan^{-1}(ax)\,dx = c^4x\tan^{-1}(ax)+\frac{4}{3}c^3dx^3\tan^{-1}(ax)+\frac{6}{5}c^2d^2x^5\tan^{-1}(ax)+\frac{4}{7}cd^3x^7\tan^{-1}(ax)+\frac{1}{9}d^4x^9$$

$$= c^4x\tan^{-1}(ax)+\frac{4}{3}c^3dx^3\tan^{-1}(ax)+\frac{6}{5}c^2d^2x^5\tan^{-1}(ax)+\frac{4}{7}cd^3x^7\tan^{-1}(ax)+\frac{1}{9}d^4x^9$$

$$= -\frac{d\left(420a^6c^3-378a^4c^2d+180a^2cd^2-35d^3\right)x^2}{630a^7}-\frac{d^2\left(378a^4c^2-180a^2cd+35d^2\right)x^4}{1260a^5}$$

$$= -\frac{d\left(420a^6c^3-378a^4c^2d+180a^2cd^2-35d^3\right)x^2}{630a^7}-\frac{d^2\left(378a^4c^2-180a^2cd+35d^2\right)x^4}{1260a^5}$$

Mathematica [A] time = 0.19, size = 212, normalized size = 0.87

$$-\frac{-24a^9x\tan^{-1}(ax)\left(315c^4+420c^3dx^2+378c^2d^2x^4+180cd^3x^6+35d^4x^8\right)+a^2dx^2\left(3a^6\left(1680c^3+756c^2dx^2+24\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(c + d*x^2)^4*ArcTan[a*x],x]
```

```
[Out] -1/7560*(a^2*d*x^2*(-420*d^3 + 30*a^2*d^2*(72*c + 7*d*x^2) - 4*a^4*d*(1134*
c^2 + 270*c*d*x^2 + 35*d^2*x^4) + 3*a^6*(1680*c^3 + 756*c^2*d*x^2 + 240*c*d
^2*x^4 + 35*d^3*x^6)) - 24*a^9*x*(315*c^4 + 420*c^3*d*x^2 + 378*c^2*d^2*x^4
 + 180*c*d^3*x^6 + 35*d^4*x^8)*ArcTan[a*x] + 12*(315*a^8*c^4 - 420*a^6*c^3*
d + 378*a^4*c^2*d^2 - 180*a^2*c*d^3 + 35*d^4)*Log[1 + a^2*x^2])/a^9
```

fricas [A] time = 0.51, size = 237, normalized size = 0.97

$$-\frac{105\,a^8d^4x^8+20\left(36\,a^8cd^3-7\,a^6d^4\right)x^6+6\left(378\,a^8c^2d^2-180\,a^6cd^3+35\,a^4d^4\right)x^4+12\left(420\,a^8c^3d-378\,a^6c^2d^2+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^4*arctan(a*x),x, algorithm="fricas")
```

```
[Out] -1/7560*(105*a^8*d^4*x^8 + 20*(36*a^8*c*d^3 - 7*a^6*d^4)*x^6 + 6*(378*a^8*c
^2*d^2 - 180*a^6*c*d^3 + 35*a^4*d^4)*x^4 + 12*(420*a^8*c^3*d - 378*a^6*c^2*
d^2 + 180*a^4*c*d^3 - 35*a^2*d^4)*x^2 - 24*(35*a^9*d^4*x^9 + 180*a^9*c*d^3*
x^7 + 378*a^9*c^2*d^2*x^5 + 420*a^9*c^3*d*x^3 + 315*a^9*c^4*x)*arctan(a*x)
+ 12*(315*a^8*c^4 - 420*a^6*c^3*d + 378*a^4*c^2*d^2 - 180*a^2*c*d^3 + 35*d^
4)*log(a^2*x^2 + 1))/a^9
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^4*arctan(a*x),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 279, normalized size = 1.14

$$\frac{d^4x^9\arctan(ax)}{9}+\frac{4c\,d^3x^7\arctan(ax)}{7}+\frac{6c^2d^2x^5\arctan(ax)}{5}+\frac{4c^3d\,x^3\arctan(ax)}{3}+c^4x\arctan(ax)-\frac{2c^3d\,x^2}{3a}-\frac{3c^2d}{10}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((d*x^2+c)^4*arctan(a*x),x)
```

```
[Out] 1/9*d^4*x^9*arctan(a*x)+4/7*c*d^3*x^7*arctan(a*x)+6/5*c^2*d^2*x^5*arctan(a*
x)+4/3*c^3*d*x^3*arctan(a*x)+c^4*x*arctan(a*x)-2/3/a*c^3*d*x^2-3/10/a*c^2*d
^2*x^4-2/21/a*c*d^3*x^6+3/5/a^3*c^2*d^2*x^2-1/72*d^4*x^8/a+1/7/a^3*x^4*c*d^
3+1/54/a^3*d^4*x^6-2/7/a^5*x^2*c*d^3-1/36/a^5*d^4*x^4+1/18/a^7*x^2*d^4-1/2/
a*ln(a^2*x^2+1)*c^4+2/3/a^3*ln(a^2*x^2+1)*c^3*d-3/5/a^5*ln(a^2*x^2+1)*c^2*d
^2+2/7/a^7*ln(a^2*x^2+1)*c*d^3-1/18/a^9*ln(a^2*x^2+1)*d^4
```

maxima [A] time = 0.32, size = 226, normalized size = 0.93

$$-\frac{1}{7560}\,a\left(\frac{105\,a^6d^4x^8+20\left(36\,a^6cd^3-7\,a^4d^4\right)x^6+6\left(378\,a^6c^2d^2-180\,a^4cd^3+35\,a^2d^4\right)x^4+12\left(420\,a^6c^3d-3\right.}{a^8}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x^2+c)^4*arctan(a*x),x, algorithm="maxima")
```

```
[Out] -1/7560*a*((105*a^6*d^4*x^8 + 20*(36*a^6*c*d^3 - 7*a^4*d^4)*x^6 + 6*(378*a^
6*c^2*d^2 - 180*a^4*c*d^3 + 35*a^2*d^4)*x^4 + 12*(420*a^6*c^3*d - 378*a^4*c
^2*d^2 + 180*a^2*c*d^3 - 35*d^4)*x^2)/a^8 + 12*(315*a^8*c^4 - 420*a^6*c^3*d
 + 378*a^4*c^2*d^2 - 180*a^2*c*d^3 + 35*d^4)*log(a^2*x^2 + 1)/a^10) + 1/315
*(35*d^4*x^9 + 180*c*d^3*x^7 + 378*c^2*d^2*x^5 + 420*c^3*d*x^3 + 315*c^4*x)
*arctan(a*x)
```

mupad [B] time = 0.20, size = 233, normalized size = 0.95

$$\mathrm{atan}\left(a\,x\right)\,\left(c^4\,x+\frac{4\,c^3\,d\,x^3}{3}+\frac{6\,c^2\,d^2\,x^5}{5}+\frac{4\,c\,d^3\,x^7}{7}+\frac{d^4\,x^9}{9}\right)+x^2\,\left(\frac{\frac{\frac{d^4}{9\,a^3}-\frac{4\,c\,d^3}{7\,a}}{a^2}+\frac{6\,c^2\,d^2}{5\,a}}{2\,a^2}-\frac{2\,c^3\,d}{3\,a}\right)+x^6\,\left(\frac{d^4}{54\,a^3}-\frac{2\,c\,}{21}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)*(c + d*x^2)^4,x)
```

```
[Out] atan(a*x)*(c^4*x + (d^4*x^9)/9 + (4*c^3*d*x^3)/3 + (4*c*d^3*x^7)/7 + (6*c^2
*d^2*x^5)/5) + x^2*(((d^4/(9*a^3) - (4*c*d^3)/(7*a))/a^2 + (6*c^2*d^2)/(5*a
))/(2*a^2) - (2*c^3*d)/(3*a)) + x^6*(d^4/(54*a^3) - (2*c*d^3)/(21*a)) - x^4
*((d^4/(9*a^3) - (4*c*d^3)/(7*a))/(4*a^2) + (3*c^2*d^2)/(10*a)) - (log(a^2*
x^2 + 1)*(35*d^4 + 315*a^8*c^4 - 180*a^2*c*d^3 - 420*a^6*c^3*d + 378*a^4*c^
2*d^2))/(630*a^9) - (d^4*x^8)/(72*a)
```

sympy [A] time = 4.30, size = 314, normalized size = 1.29

$$\begin{cases} c^4x\,\mathrm{atan}\,(ax)+\frac{4c^3dx^3\,\mathrm{atan}\,(ax)}{3}+\frac{6c^2d^2x^5\,\mathrm{atan}\,(ax)}{5}+\frac{4cd^3x^7\,\mathrm{atan}\,(ax)}{7}+\frac{d^4x^9\,\mathrm{atan}\,(ax)}{9}-\frac{c^4\log\left(x^2+\frac{1}{a^2}\right)}{2a}-\frac{2c^3dx^2}{3a}-\frac{3c^2d^2x^4}{10a}- \\ 0 \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((d*x**2+c)**4*atan(a*x),x)
```

```
[Out] Piecewise((c**4*x*atan(a*x) + 4*c**3*d*x**3*atan(a*x)/3 + 6*c**2*d**2*x**5*
atan(a*x)/5 + 4*c*d**3*x**7*atan(a*x)/7 + d**4*x**9*atan(a*x)/9 - c**4*log(
x**2 + a**(-2))/(2*a) - 2*c**3*d*x**2/(3*a) - 3*c**2*d**2*x**4/(10*a) - 2*c
*d**3*x**6/(21*a) - d**4*x**8/(72*a) + 2*c**3*d*log(x**2 + a**(-2))/(3*a**3
) + 3*c**2*d**2*x**2/(5*a**3) + c*d**3*x**4/(7*a**3) + d**4*x**6/(54*a**3)
- 3*c**2*d**2*log(x**2 + a**(-2))/(5*a**5) - 2*c*d**3*x**2/(7*a**5) - d**4*
x**4/(36*a**5) + 2*c*d**3*log(x**2 + a**(-2))/(7*a**7) + d**4*x**2/(18*a**7
) - d**4*log(x**2 + a**(-2))/(18*a**9), Ne(a, 0)), (0, True))
```

3.1151 $\int \frac{x^3(a+b\tan^{-1}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=361

$$\frac{d\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^2}-\frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2e^2}-\frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2e^2}$$

```
[Out] -1/2*b*x/c/e+1/2*b*arctan(c*x)/c^2/e+1/2*x^2*(a+b*arctan(c*x))/e+d*(a+b*arc
tan(c*x))*ln(2/(1-I*c*x))/e^2-1/2*d*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)-x*
e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2-1/2*d*(a+b*arctan(c*x))*ln
(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2-1/2*I*b
*d*polylog(2,1-2/(1-I*c*x))/e^2+1/4*I*b*d*polylog(2,1-2*c*((-d)^(1/2)-x*e^(
1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2+1/4*I*b*d*polylog(2,1-2*c*((-
d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2
```

Rubi [A] time = 0.37, antiderivative size = 361, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4916, 4852, 321, 203, 4980, 4856, 2402, 2315, 2447}

$$-\frac{ibd\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e^2}+\frac{ibd\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4e^2}+\frac{ibd\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4e^2}+\frac{d\log}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2),x]
```

```
[Out] -(b*x)/(2*c*e) + (b*ArcTan[c*x])/(2*c^2*e) + (x^2*(a + b*ArcTan[c*x]))/(2*e
) + (d*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e^2 - (d*(a + b*ArcTan[c*x])
*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/
(2*e^2) - (d*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[
-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*e^2) - ((I/2)*b*d*PolyLog[2, 1 - 2/(1 -
I*c*x)])/e^2 + ((I/4)*b*d*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*S
qrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/e^2 + ((I/4)*b*d*PolyLog[2, 1 - (2*c*(S
qrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/e^2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
```

```
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx = \frac{\int x\left(a+b\tan^{-1}(cx)\right)dx}{e} - \frac{d\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}dx}{e}$$

$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e} - \frac{(bc)\int \frac{x^2}{1+c^2x^2}dx}{2e} - \frac{d\int\left(-\frac{a+b\tan^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{a+b\tan^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e}$$

$$= -\frac{bx}{2ce} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e} + \frac{d\int \frac{a+b\tan^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}dx}{2e^{3/2}} - \frac{d\int \frac{a+b\tan^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}dx}{2e^{3/2}} + \frac{b\int \frac{1}{1+c^2x^2}\,d}{2ce}$$

$$= -\frac{bx}{2ce} + \frac{b\tan^{-1}(cx)}{2c^2e} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e} + \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{d\left(a\right.}{}$$

$$= -\frac{bx}{2ce} + \frac{b\tan^{-1}(cx)}{2c^2e} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e} + \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{d\left(a\right.}{}$$

$$= -\frac{bx}{2ce} + \frac{b\tan^{-1}(cx)}{2c^2e} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{2e} + \frac{d\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{d\left(a\right.}{}$$

Mathematica [A] time = 0.27, size = 503, normalized size = 1.39

$$-\frac{ad\log\left(d+ex^2\right)}{2e^2} + \frac{ax^2}{2e} + \frac{b\tan^{-1}(cx)}{2c^2e} - \frac{ibd\text{Li}_2\left(-\frac{\sqrt{e}(1-icx)}{ic\sqrt{-d}-\sqrt{e}}\right)}{4e^2} - \frac{ibd\text{Li}_2\left(\frac{\sqrt{e}(1-icx)}{i\sqrt{-d}c+\sqrt{e}}\right)}{4e^2} + \frac{ibd\text{Li}_2\left(-\frac{\sqrt{e}(icx+1)}{ic\sqrt{-d}-\sqrt{e}}\right)}{4e^2} + \frac{ibd\text{Li}_2\left(\frac{\sqrt{e}}{i\sqrt{}}\right.}{4e^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2),x]
```

```
[Out] -1/2*(b*x)/(c*e) + (a*x^2)/(2*e) + (b*ArcTan[c*x])/(2*c^2*e) + (b*x^2*ArcTa
n[c*x])/(2*e) + ((I/4)*b*d*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c
*Sqrt[-d] - I*Sqrt[e])])/e^2 - ((I/4)*b*d*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] -
 Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/e^2 - ((I/4)*b*d*Log[1 - I*c*x]*Log
[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])])/e^2 + ((I/4)*b*d*Log
[1 + I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/e^2 -
 (a*d*Log[d + e*x^2])/(2*e^2) - ((I/4)*b*d*PolyLog[2, -((Sqrt[e]*(1 - I*c*x
))/(I*c*Sqrt[-d] - Sqrt[e]))])/e^2 - ((I/4)*b*d*PolyLog[2, (Sqrt[e]*(1 - I*
c*x))/(I*c*Sqrt[-d] + Sqrt[e])])/e^2 + ((I/4)*b*d*PolyLog[2, -((Sqrt[e]*(1
+ I*c*x))/(I*c*Sqrt[-d] - Sqrt[e]))])/e^2 + ((I/4)*b*d*PolyLog[2, (Sqrt[e]*
(1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])])/e^2
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3\arctan(cx) + ax^3}{ex^2+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arctan(c*x) + a*x^3)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.46, size = 703, normalized size = 1.95

$$\frac{a\,x^2}{2e}-\frac{ad\ln\left(c^2e\,x^2+c^2d\right)}{2e^2}+\frac{b\arctan\left(cx\right)x^2}{2e}-\frac{b\arctan\left(cx\right)d\ln\left(c^2e\,x^2+c^2d\right)}{2e^2}-\frac{bx}{2ce}+\frac{b\arctan\left(cx\right)}{2c^2e}-\frac{ibd\ln\left(cx+\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(e*x^2+d),x)
```

```
[Out] 1/2*a/e*x^2-1/2*a*d/e^2*ln(c^2*e*x^2+c^2*d)+1/2*b*arctan(c*x)*x^2/e-1/2*b*a
rctan(c*x)/e^2*d*ln(c^2*e*x^2+c^2*d)-1/2*b*x/c/e+1/2*b*arctan(c*x)/c^2/e+1/
4*I*b/e^2*d*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/Ro
otOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))+1/4*I*b/e^2*d*dilog((RootOf(e*_Z^2+2
*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))+1/
4*I*b/e^2*d*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/Ro
otOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))-1/4*I*b/e^2*d*ln(I+c*x)*ln((RootOf(e
*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index
=2))+1/4*I*b/e^2*d*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/Ro
otOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))-1/4*I*b/e^2*d*ln(c*x-I)*ln(c^2*e*x^2
+c^2*d)-1/4*I*b/e^2*d*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)
/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))+1/4*I*b/e^2*d*ln(I+c*x)*ln(c^2*e*
x^2+c^2*d)-1/4*I*b/e^2*d*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x
-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/e^2*d*ln(I+c*x)*ln((Ro
otOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e
,index=1))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{x^2}{e}-\frac{d\log\left(ex^2+d\right)}{e^2}\right)+2\,b\int\frac{x^3\arctan\left(cx\right)}{2\left(ex^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(x^2/e - d*log(e*x^2 + d)/e^2) + 2*b*integrate(1/2*x^3*arctan(c*x)/(e
*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + e*x^2),x)
```

```
[Out] int((x^3*(a + b*atan(c*x)))/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^3\left(a+b\,\mathrm{atan}\left(cx\right)\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))/(d + e*x**2), x)
```

3.1152 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx$

Optimal. Leaf size=311

$$\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2e}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2e}-\frac{\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e}$$

```
[Out] -(a+b*arctan(c*x))*ln(2/(1-I*c*x))/e+1/2*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/
2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e+1/2*(a+b*arctan(c*x))*l
n(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e+1/2*I*b*
polylog(2,1-2/(1-I*c*x))/e-1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(
1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e-1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)+x*
e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e
```

Rubi [A] time = 0.24, antiderivative size = 311, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4980, 4856, 2402, 2315, 2447}

$$-\frac{ib\,\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4e}-\frac{ib\,\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4e}+\frac{ib\,\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e}+\frac{\left(a+b\tan\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + e*x^2),x]
```

```
[Out] -(((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e) + ((a + b*ArcTan[c*x])*Log[(2
*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*e) +
 ((a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqr
t[e])*(1 - I*c*x))])/(2*e) + ((I/2)*b*PolyLog[2, 1 - 2/(1 - I*c*x)])/e - ((
I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e]
)*(1 - I*c*x))])/e - ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/(
(c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/e
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
```

```
c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx = \int\left(-\frac{a+b\tan^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{a+b\tan^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx$$

$$= -\frac{\int\frac{a+b\tan^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2\sqrt{e}}+\frac{\int\frac{a+b\tan^{-1}(cx)}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2\sqrt{e}}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2e}+\frac{(a+b}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2e}+\frac{(a+b}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{e}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2e}+\frac{(a+b}{}$$

Mathematica [A] time = 0.12, size = 441, normalized size = 1.42

$$\frac{a\log\left(d+ex^2\right)}{2e}+\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}(1-icx)}{ic\sqrt{-d}-\sqrt{e}}\right)}{4e}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}(1-icx)}{i\sqrt{-d}c+\sqrt{e}}\right)}{4e}-\frac{ib\text{Li}_2\left(-\frac{\sqrt{e}(icx+1)}{ic\sqrt{-d}-\sqrt{e}}\right)}{4e}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}(icx+1)}{i\sqrt{-d}c+\sqrt{e}}\right)}{4e}-\frac{ib\log(1+icx)}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + e*x^2),x]
```

```
[Out] ((-1/4*I)*b*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] - I*S
qrt[e])])/e + ((I/4)*b*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqr
t[-d] + I*Sqrt[e])])/e + ((I/4)*b*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]
*x))/(c*Sqrt[-d] - I*Sqrt[e])])/e - ((I/4)*b*Log[1 + I*c*x]*Log[(c*(Sqrt[-d
] + Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/e + (a*Log[d + e*x^2])/(2*e) + (
(I/4)*b*PolyLog[2, -((Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] - Sqrt[e]))])/e +
((I/4)*b*PolyLog[2, (Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])])/e - ((
I/4)*b*PolyLog[2, -((Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] - Sqrt[e]))])/e - (
(I/4)*b*PolyLog[2, (Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])])/e
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx\arctan(cx)+ax}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x*arctan(c*x) + a*x)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.36, size = 646, normalized size = 2.08

$$\frac{a\ln\left(c^2e\,x^2+c^2d\right)}{2e}+\frac{b\ln\left(c^2e\,x^2+c^2d\right)\arctan\left(cx\right)}{2e}-\frac{ib\ln\left(cx-i\right)\ln\left(\frac{\mathrm{RootOf}\left(e\_Z^2+2i\_Ze+c^2d-e,index=1\right)-cx+i}{\mathrm{RootOf}\left(e\_Z^2+2i\_Ze+c^2d-e,index=1\right)}\right)}{4e}-\frac{ib\ln\left(cx\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(e*x^2+d),x)
```

```
[Out] 1/2*a/e*ln(c^2*e*x^2+c^2*d)+1/2*b/e*ln(c^2*e*x^2+c^2*d)*arctan(c*x)-1/4*I*b
/e*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z
^2+2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/e*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*
e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))+1/4*I*b/
e*ln(c*x-I)*ln(c^2*e*x^2+c^2*d)-1/4*I*b/e*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2
*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/e*dil
og((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c
^2*d-e,index=2))+1/4*I*b/e*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,ind
ex=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+1/4*I*b/e*ln(I+c*x)*l
n((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^
2*d-e,index=2))-1/4*I*b/e*ln(I+c*x)*ln(c^2*e*x^2+c^2*d)+1/4*I*b/e*dilog((Ro
otOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e
,index=1))+1/4*I*b/e*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/
RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,b\int\frac{x\arctan\left(cx\right)}{2\left(ex^2+d\right)}\,dx+\frac{a\log\left(ex^2+d\right)}{2\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 2*b*integrate(1/2*x*arctan(c*x)/(e*x^2 + d), x) + 1/2*a*log(e*x^2 + d)/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + e*x^2),x)
```

```
[Out] int((x*(a + b*atan(c*x)))/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x\left(a+b\,\mathrm{atan}\left(cx\right)\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x*(a + b*atan(c*x))/(d + e*x**2), x)
```

3.1153 $\int \frac{a+b\tan^{-1}(cx)}{x(d+ex^2)}\,dx$

Optimal. Leaf size=353

$$-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2d}-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2d}+\frac{\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d}$$

```
[Out] a*ln(x)/d+(a+b*arctan(c*x))*ln(2/(1-I*c*x))/d-1/2*(a+b*arctan(c*x))*ln(2*c*
((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d-1/2*(a+b*arcta
n(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d
+1/2*I*b*polylog(2,-I*c*x)/d-1/2*I*b*polylog(2,I*c*x)/d-1/2*I*b*polylog(2,1
-2/(1-I*c*x))/d+1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c
*(-d)^(1/2)-I*e^(1/2)))/d+1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1
-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d
```

Rubi [A] time = 0.39, antiderivative size = 353, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4928, 4848, 2391, 4980, 4856, 2402, 2315, 2447}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4d}+\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4d}+\frac{ib\text{PolyLog}(2,-icx)}{2d}-\frac{ib\text{PolyLog}(2,ic}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] (a*Log[x])/d + ((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/d - ((a + b*ArcTan[
c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x
))])/(2*d) - ((a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt
[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*d) + ((I/2)*b*PolyLog[2, (-I)*c*x])/d -
 ((I/2)*b*PolyLog[2, I*c*x])/d - ((I/2)*b*PolyLog[2, 1 - 2/(1 - I*c*x)])/d
+ ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqr
t[e])*(1 - I*c*x))])/d + ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x
))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/d
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4928

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^(m_.))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Int[ExpandIntegrand[a + b*ArcTan[c*x], x^m/(d + e*x^2), x], x]
 /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[m] &&  !(EqQ[m, 1] && NeQ[a, 0])
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{dx}-\frac{ex\left(a+b\tan^{-1}(cx)\right)}{d\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d}-\frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx}{d}$$

$$= \frac{a\log(x)}{d}+\frac{(ib)\int \frac{\log(1-icx)}{x}\,dx}{2d}-\frac{(ib)\int \frac{\log(1+icx)}{x}\,dx}{2d}-\frac{e\int \left(-\frac{a+b\tan^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{a+b\tan^{-1}(}{2\sqrt{e}\left(\sqrt{-d}+\right.}\right.}{d}$$

$$= \frac{a\log(x)}{d}+\frac{ib\text{Li}_2(-icx)}{2d}-\frac{ib\text{Li}_2(icx)}{2d}+\frac{\sqrt{e}\int \frac{a+b\tan^{-1}(cx)}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2d}-\frac{\sqrt{e}\int \frac{a+b\tan^{-1}(cx)}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2d}$$

$$= \frac{a\log(x)}{d}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2d}-$$

$$= \frac{a\log(x)}{d}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2d}-$$

$$= \frac{a\log(x)}{d}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d}-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2d}-$$

Mathematica [A] time = 0.27, size = 429, normalized size = 1.22

$$-2a\log\left(d+ex^2\right)+4a\log(x)+ib\text{Li}_2\left(\frac{\sqrt{e}(i-cx)}{\sqrt{-d}c+i\sqrt{e}}\right)-ib\text{Li}_2\left(\frac{\sqrt{e}(1-icx)}{i\sqrt{-d}c+\sqrt{e}}\right)+ib\text{Li}_2\left(\frac{\sqrt{e}(icx+1)}{i\sqrt{-d}c+\sqrt{e}}\right)-ib\text{Li}_2\left(\frac{\sqrt{e}(cx+i)}{\sqrt{-d}c+i\sqrt{e}}\right)+ib$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x^2)),x]
```

```
[Out] (4*a*Log[x] + I*b*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d]
 - I*Sqrt[e])] - I*b*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[
-d] + I*Sqrt[e])] - I*b*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sq
rt[-d] - I*Sqrt[e])] + I*b*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c
*Sqrt[-d] + I*Sqrt[e])] - 2*a*Log[d + e*x^2] + (2*I)*b*PolyLog[2, (-I)*c*x]
 - (2*I)*b*PolyLog[2, I*c*x] + I*b*PolyLog[2, (Sqrt[e]*(I - c*x))/(c*Sqrt[-
d] + I*Sqrt[e])] - I*b*PolyLog[2, (Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] + Sqr
t[e])] + I*b*PolyLog[2, (Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])] - I
*b*PolyLog[2, (Sqrt[e]*(I + c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(4*d)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{ex^3+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e*x^3 + d*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.40, size = 736, normalized size = 2.08

$$-\frac{a\ln\left(c^2ex^2+c^2d\right)}{2d}+\frac{a\ln(cx)}{d}-\frac{b\arctan(cx)\ln\left(c^2ex^2+c^2d\right)}{2d}+\frac{b\arctan(cx)\ln(cx)}{d}-\frac{ib\,\text{dilog}\left(\frac{\text{RootOf}\left(e\_Z^2-2i\_Ze+c\right.}{\text{RootOf}\left(e\_Z^2-2i\_Ze\right.}\right.}{4d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(e*x^2+d),x)
```

```
[Out] -1/2*a/d*ln(c^2*e*x^2+c^2*d)+a/d*ln(c*x)-1/2*b*arctan(c*x)/d*ln(c^2*e*x^2+c
^2*d)+b*arctan(c*x)/d*ln(c*x)+1/4*I*b/d*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d
-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))+1/4*I*b/d*dilog
((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2
*d-e,index=2))-1/4*I*b/d*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x
-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))-1/4*I*b/d*dilog((RootOf(e*_Z^2
-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-
1/2*I*b/d*dilog(1-I*c*x)+1/4*I*b/d*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2
*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))-1/2*I*b/d*ln(
c*x)*ln(1-I*c*x)+1/2*I*b/d*dilog(1+I*c*x)-1/4*I*b/d*ln(I+c*x)*ln((RootOf(e*
_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=
2))+1/2*I*b/d*ln(c*x)*ln(1+I*c*x)+1/4*I*b/d*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I
```

```
*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))-1/4*
I*b/d*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf(e
*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/d*ln(c*x-I)*ln(c^2*e*x^2+c^2*d)+1/
4*I*b/d*ln(c^2*e*x^2+c^2*d)*ln(I+c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}a\left(\frac{\log\left(ex^2+d\right)}{d}-\frac{2\log(x)}{d}\right)+2b\int\frac{\arctan(cx)}{2\left(ex^3+dx\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a*(log(e*x^2 + d)/d - 2*log(x)/d) + 2*b*integrate(1/2*arctan(c*x)/(e*x
^3 + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}(c\,x)}{x\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + e*x^2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{atan}(cx)}{x\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(e*x**2+d),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x*(d + e*x**2)), x)
```

3.1154 $\int \frac{a+b\tan^{-1}(cx)}{x^3(d+ex^2)}\,dx$

Optimal. Leaf size=409

$$-\frac{e\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2d^2}+\frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}\right.}{(1-icx)\left(c\sqrt{-d}+\right.}\right.}{2d^2}$$

```
[Out] -1/2*b*c/d/x-1/2*b*c^2*arctan(c*x)/d+1/2*(-a-b*arctan(c*x))/d/x^2-a*e*ln(x)
/d^2-e*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/d^2+1/2*e*(a+b*arctan(c*x))*ln(2*c
*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2+1/2*e*(a+b*
arctan(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2
)))/d^2-1/2*I*b*e*polylog(2,-I*c*x)/d^2+1/2*I*b*e*polylog(2,I*c*x)/d^2+1/2*
I*b*e*polylog(2,1-2/(1-I*c*x))/d^2-1/4*I*b*e*polylog(2,1-2*c*((-d)^(1/2)-x*
e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2-1/4*I*b*e*polylog(2,1-2*c*
((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^2
```

Rubi [A] time = 0.48, antiderivative size = 409, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4918, 4852, 325, 203, 4928, 4848, 2391, 4980, 4856, 2402, 2315, 2447}

$$-\frac{ibe\text{PolyLog}(2,-icx)}{2d^2}+\frac{ibe\text{PolyLog}(2,icx)}{2d^2}+\frac{ibe\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2d^2}-\frac{ibe\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4d^2}-\frac{ib}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] -(b*c)/(2*d*x) - (b*c^2*ArcTan[c*x])/(2*d) - (a + b*ArcTan[c*x])/(2*d*x^2)
- (a*e*Log[x])/d^2 - (e*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/d^2 + (e*(a
 + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e]
)*(1 - I*c*x))])/(2*d^2) + (e*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt
[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*d^2) - ((I/2)*b*e*PolyL
og[2, (-I)*c*x])/d^2 + ((I/2)*b*e*PolyLog[2, I*c*x])/d^2 + ((I/2)*b*e*PolyL
og[2, 1 - 2/(1 - I*c*x)])/d^2 - ((I/4)*b*e*PolyLog[2, 1 - (2*c*(Sqrt[-d] -
Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^2 - ((I/4)*b*e*PolyL
og[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x
))])/d^2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4928

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^(m_.))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Int[ExpandIntegrand[a + b*ArcTan[c*x], x^m/(d + e*x^2), x], x]
 /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[m] &&  !(EqQ[m, 1] && NeQ[a, 0])
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
```

```
IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3(d+ex^2)}\,dx = \frac{\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{x(d+ex^2)}\,dx}{d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{2dx^2} + \frac{(bc)\int \frac{1}{x^2(1+c^2x^2)}\,dx}{2d} - \frac{e\int \left(\frac{a+b\tan^{-1}(cx)}{dx} - \frac{ex(a+b\tan^{-1}(cx))}{d(d+ex^2)}\right)dx}{d}$$

$$= -\frac{bc}{2dx} - \frac{a+b\tan^{-1}(cx)}{2dx^2} - \frac{(bc^3)\int \frac{1}{1+c^2x^2}\,dx}{2d} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^2} + \frac{e^2\int \frac{x(a+b\tan^{-1}(cx))}{d+ex^2}\,dx}{d^2}$$

$$= -\frac{bc}{2dx} - \frac{bc^2\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{2dx^2} - \frac{ae\log(x)}{d^2} - \frac{(ibe)\int \frac{\log(1-icx)}{x}\,dx}{2d^2} + \frac{(ibe)\int \frac{\log(1}{x}}{2d^2}$$

$$= -\frac{bc}{2dx} - \frac{bc^2\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{2dx^2} - \frac{ae\log(x)}{d^2} - \frac{ibe\mathrm{Li}_2(-icx)}{2d^2} + \frac{ibe\mathrm{Li}_2(icx)}{2d^2} - \frac{e^{3/2}}{}$$

$$= -\frac{bc}{2dx} - \frac{bc^2\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{2dx^2} - \frac{ae\log(x)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^2} +$$

$$= -\frac{bc}{2dx} - \frac{bc^2\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{2dx^2} - \frac{ae\log(x)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^2} +$$

$$= -\frac{bc}{2dx} - \frac{bc^2\tan^{-1}(cx)}{2d} - \frac{a+b\tan^{-1}(cx)}{2dx^2} - \frac{ae\log(x)}{d^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d^2} +$$

Mathematica [C] time = 0.30, size = 507, normalized size = 1.24

$$\frac{\frac{-a-b\tan^{-1}(cx)}{2x^2} - \frac{bc\,{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2};-c^2x^2\right)}{2x}}{d} - \frac{e\left(-\frac{a\log(d+ex^2)}{2d} + \frac{a\log(x)}{d} - \frac{ib\left(\mathrm{Li}_2\left(-\frac{\sqrt{e}(1-icx)}{ic\sqrt{-d}-\sqrt{e}}\right)+\log(1-icx)\log\left(\frac{c(\sqrt{-d}-\sqrt{e}x)}{c\sqrt{-d}+i\sqrt{e}}\right)\right)}{4d} - \frac{ib\left(\mathrm{Li}_2\left(\frac{\sqrt{e}(1-i}{i\sqrt{-d}c+}\right.\right.}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)),x]
```

```
[Out] ((-a - b*ArcTan[c*x])/(2*x^2) - (b*c*Hypergeometric2F1[-1/2, 1, 1/2, -(c^2*
x^2)])/(2*x))/d - (e*((a*Log[x])/d - (a*Log[d + e*x^2])/(2*d) + ((I/2)*b*Po
lyLog[2, (-I)*c*x])/d - ((I/2)*b*PolyLog[2, I*c*x])/d - ((I/4)*b*(Log[1 - I
*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])] + PolyLog[2,
 -((Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] - Sqrt[e]))]))/d - ((I/4)*b*(Log[1 -
 I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])] + PolyLog[
2, (Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])]))/d + ((I/4)*b*(Log[1 +
I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])] + PolyLog[2
, -((Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] - Sqrt[e]))]))/d + ((I/4)*b*(Log[1
+ I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])] + PolyLog
[2, (Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])]))/d))/d
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\arctan(cx)+a}{ex^5+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e*x^5 + d*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.39, size = 801, normalized size = 1.96

$$\frac{ae\ln\left(c^2ex^2+c^2d\right)}{2d^2}-\frac{a}{2dx^2}-\frac{ae\ln\left(cx\right)}{d^2}+\frac{b\arctan\left(cx\right)e\ln\left(c^2ex^2+c^2d\right)}{2d^2}-\frac{b\arctan\left(cx\right)}{2dx^2}-\frac{b\arctan\left(cx\right)e\ln\left(cx\right)}{d^2}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(e*x^2+d),x)
```

```
[Out] 1/2*a*e/d^2*ln(c^2*e*x^2+c^2*d)-1/2*a/d/x^2-a/d^2*e*ln(c*x)+1/2*b*arctan(c*
x)*e/d^2*ln(c^2*e*x^2+c^2*d)-1/2*b*arctan(c*x)/d/x^2-b*arctan(c*x)/d^2*e*ln
(c*x)-1/2*I*b/d^2*e*ln(c*x)*ln(1+I*c*x)+1/4*I*b/d^2*e*dilog((RootOf(e*_Z^2-
2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1
/4*I*b/d^2*e*ln(I+c*x)*ln(c^2*e*x^2+c^2*d)-1/4*I*b/d^2*e*ln(c*x-I)*ln((Root
Of(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,i
ndex=2))+1/4*I*b/d^2*e*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2
)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))+1/4*I*b/d^2*e*ln(c*x-I)*l
n(c^2*e*x^2+c^2*d)-1/4*I*b/d^2*e*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,inde
x=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))-1/2*I*b/d^2*e*dilog(1+
I*c*x)+1/4*I*b/d^2*e*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-
c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+1/4*I*b/d^2*e*dilog((RootOf
(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,ind
ex=2))-1/2*b*c/d/x-1/2*b*c^2*arctan(c*x)/d+1/2*I*b/d^2*e*ln(c*x)*ln(1-I*c*x
)-1/4*I*b/d^2*e*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootO
f(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/d^2*e*ln(c*x-I)*ln((RootOf(e*_Z
^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)
)+1/2*I*b/d^2*e*dilog(1-I*c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a\left(\frac{e\log\left(ex^2+d\right)}{d^2}-\frac{2e\log(x)}{d^2}-\frac{1}{dx^2}\right)+2b\int\frac{\arctan\left(cx\right)}{2\left(ex^5+dx^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a*(e*log(e*x^2 + d)/d^2 - 2*e*log(x)/d^2 - 1/(d*x^2)) + 2*b*integrate(1
/2*arctan(c*x)/(e*x^5 + d*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^3\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + e*x^2)),x)
[Out] int((a + b*atan(c*x))/(x^3*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{atan}(cx)}{x^3 (d + ex^2)}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(e*x**2+d),x)
[Out] Integral((a + b*atan(c*x))/(x**3*(d + e*x**2)), x)
```

3.1155 $\int \frac{x^2(a+b\tan^{-1}(cx))}{d+ex^2}\,dx$

Optimal. Leaf size=555

$$-\frac{a\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{e^{3/2}}+\frac{ax}{e}-\frac{b\log\left(c^2x^2+1\right)}{2ce}+\frac{ib\sqrt{-d}\,\mathrm{Li}_2\left(\frac{\sqrt{e}(i-cx)}{\sqrt{-d}c+i\sqrt{e}}\right)}{4e^{3/2}}-\frac{ib\sqrt{-d}\,\mathrm{Li}_2\left(\frac{\sqrt{e}(1-icx)}{i\sqrt{-d}c+\sqrt{e}}\right)}{4e^{3/2}}-\frac{ib\sqrt{-d}\,\mathrm{Li}_2\left(\frac{\sqrt{e}(icx+}{i\sqrt{-d}c+}\right.}{4e^{3/2}}$$

```
[Out] a*x/e+b*x*arctan(c*x)/e-1/2*b*ln(c^2*x^2+1)/c/e-1/4*I*b*ln(1+I*c*x)*ln(c*((
-d)^(1/2)-x*e^(1/2))/(c*(-d)^(1/2)-I*e^(1/2)))*(-d)^(1/2)/e^(3/2)+1/4*I*b*l
n(1-I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))*(-d)^(1/2)
/e^(3/2)-1/4*I*b*ln(1-I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)-I*e^
(1/2)))*(-d)^(1/2)/e^(3/2)+1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/
(c*(-d)^(1/2)+I*e^(1/2)))*(-d)^(1/2)/e^(3/2)+1/4*I*b*polylog(2,(I-c*x)*e^(1
/2)/(c*(-d)^(1/2)+I*e^(1/2)))*(-d)^(1/2)/e^(3/2)+1/4*I*b*polylog(2,(I+c*x)*
e^(1/2)/(c*(-d)^(1/2)+I*e^(1/2)))*(-d)^(1/2)/e^(3/2)-1/4*I*b*polylog(2,(1-I
*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+e^(1/2)))*(-d)^(1/2)/e^(3/2)-1/4*I*b*polylog(
2,(1+I*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+e^(1/2)))*(-d)^(1/2)/e^(3/2)-a*arctan(x
*e^(1/2)/d^(1/2))*d^(1/2)/e^(3/2)
```

Rubi [A] time = 0.63, antiderivative size = 555, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4916, 4846, 260, 4910, 205, 4908, 2409, 2394, 2393, 2391}

$$\frac{ib\sqrt{-d}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}(-cx+i)}{c\sqrt{-d}+i\sqrt{e}}\right)}{4e^{3/2}}-\frac{ib\sqrt{-d}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}(1-icx)}{\sqrt{e}+ic\sqrt{-d}}\right)}{4e^{3/2}}-\frac{ib\sqrt{-d}\,\mathrm{PolyLog}\left(2,\frac{\sqrt{e}(1+icx)}{\sqrt{e}+ic\sqrt{-d}}\right)}{4e^{3/2}}+\frac{ib\sqrt{-d}\,\mathrm{PolyL}}{4}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2),x]
```

```
[Out] (a*x)/e + (b*x*ArcTan[c*x])/e - (a*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/e^(
3/2) - ((I/4)*b*Sqrt[-d]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*S
qrt[-d] - I*Sqrt[e])])/e^(3/2) + ((I/4)*b*Sqrt[-d]*Log[1 - I*c*x]*Log[(c*(S
qrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/e^(3/2) - ((I/4)*b*Sqrt[-d
]*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])])/
e^(3/2) + ((I/4)*b*Sqrt[-d]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(
c*Sqrt[-d] + I*Sqrt[e])])/e^(3/2) - (b*Log[1 + c^2*x^2])/(2*c*e) + ((I/4)*b
*Sqrt[-d]*PolyLog[2, (Sqrt[e]*(I - c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/e^(3/2)
 - ((I/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] + Sqrt[
e])])/e^(3/2) - ((I/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*(1 + I*c*x))/(I*c*Sqr
t[-d] + Sqrt[e])])/e^(3/2) + ((I/4)*b*Sqrt[-d]*PolyLog[2, (Sqrt[e]*(I + c*x
))/(c*Sqrt[-d] + I*Sqrt[e])])/e^(3/2)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx = \frac{\int\left(a+b\tan^{-1}(cx)\right)dx}{e} - \frac{d\int \frac{a+b\tan^{-1}(cx)}{d+ex^2}\,dx}{e}$$

$$= \frac{ax}{e} + \frac{b\int \tan^{-1}(cx)\,dx}{e} - \frac{(ad)\int \frac{1}{d+ex^2}\,dx}{e} - \frac{(bd)\int \frac{\tan^{-1}(cx)}{d+ex^2}\,dx}{e}$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} - \frac{a\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{3/2}} - \frac{(bc)\int \frac{x}{1+c^2x^2}\,dx}{e} - \frac{(ibd)\int \frac{\log(1-icx)}{d+ex^2}\,dx}{2e} +$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} - \frac{a\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{3/2}} - \frac{b\log\left(1+c^2x^2\right)}{2ce} - \frac{(ibd)\int\left(\frac{\sqrt{-d}\,\log(1-icx}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}\right.}{2}$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} - \frac{a\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{3/2}} - \frac{b\log\left(1+c^2x^2\right)}{2ce} - \frac{\left(ib\sqrt{-d}\right)\int \frac{\log(1-icx)}{\sqrt{-d}-\sqrt{e}\,x}}{4e}$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} - \frac{a\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{3/2}} - \frac{ib\sqrt{-d}\,\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4e^{3/2}} +$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} - \frac{a\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{3/2}} - \frac{ib\sqrt{-d}\,\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4e^{3/2}} +$$

$$= \frac{ax}{e} + \frac{bx\tan^{-1}(cx)}{e} - \frac{a\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{3/2}} - \frac{ib\sqrt{-d}\,\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4e^{3/2}} +$$

Mathematica [A] time = 3.71, size = 766, normalized size = 1.38

$$-\frac{a\sqrt{d}\,\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{e^{3/2}} + \frac{ax}{e} + \frac{b\left(c^2d\left(i\left(\text{Li}_2\left(\frac{\left(dc^2+e+2i\sqrt{-c^2de}\right)\left(cd+\sqrt{-c^2de}\,x\right)}{\left(c^2d-e\right)\left(cd-\sqrt{-c^2de}\,x\right)}\right)-\text{Li}_2\left(\frac{\left(dc^2+e-2i\sqrt{-c^2de}\right)\left(cd+\sqrt{-c^2de}\,x\right)}{\left(c^2d-e\right)\left(cd-\sqrt{-c^2de}\,x\right)}\right)\right)-2\cos^{-1}\left(\frac{c^2d+e}{e-c^2d}\right)\tanh^{-1}\left(\frac{c}{\sqrt{-}}\right.\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2),x]
```

```
[Out] (a*x)/e - (a*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/e^(3/2) + (b*(4*c*x*ArcTa
n[c*x] - 2*Log[1 + c^2*x^2] + (c^2*d*(-4*ArcTan[c*x]*ArcTanh[(c*d)/(Sqrt[-(
c^2*d*e)]*x)] - 2*ArcCos[(c^2*d + e)/(-(c^2*d) + e)]*ArcTanh[(c*e*x)/Sqrt[-
(c^2*d*e)]] - (ArcCos[(c^2*d + e)/(-(c^2*d) + e)] - (2*I)*ArcTanh[(c*e*x)/S
qrt[-(c^2*d*e)]])*Log[(2*c*d*(I*e + Sqrt[-(c^2*d*e)])*(-I + c*x))/((c^2*d -
 e)*(-(c*d) + Sqrt[-(c^2*d*e)]*x))] - (ArcCos[(c^2*d + e)/(-(c^2*d) + e)] +
 (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(2*c*d*((-I)*e + Sqrt[-(c^2*d
*e)])*(I + c*x))/((c^2*d - e)*(-(c*d) + Sqrt[-(c^2*d*e)]*x))] + (ArcCos[(c^
2*d + e)/(-(c^2*d) + e)] + (2*I)*ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + (2*I
)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sqrt[-
(c^2*d) + e]*E^(I*ArcTan[c*x])*Sqrt[-(c^2*d) - e + (-(c^2*d) + e)*Cos[2*Arc
Tan[c*x]]])] + (ArcCos[(c^2*d + e)/(-(c^2*d) + e)] - (2*I)*ArcTanh[(c*d)/(S
qrt[-(c^2*d*e)]*x)] - (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(Sqrt[2]
*Sqrt[-(c^2*d*e)]*E^(I*ArcTan[c*x]))/(Sqrt[-(c^2*d) + e]*Sqrt[-(c^2*d) - e
+ (-(c^2*d) + e)*Cos[2*ArcTan[c*x]]])] + I*(-PolyLog[2, ((c^2*d + e - (2*I)
*Sqrt[-(c^2*d*e)])*(c*d + Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(c*d - Sqrt[-(c
^2*d*e)]*x))] + PolyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(c*d + Sqr
```

```
t[-(c^2*d*e)]*x))/((c^2*d - e)*(c*d - Sqrt[-(c^2*d*e)]*x))]])))/Sqrt[-(c^2*d
*e)]))/(4*c*e)
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\arctan(cx)+ax^2}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arctan(c*x) + a*x^2)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.85, size = 2409, normalized size = 4.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(e*x^2+d),x)
```

```
[Out] 1/8*c^6*b*(d*e)^(1/2)/e^3*d^3*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2
+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2-5/4*c^2*b*(d*e)^(1/2)/e^2*d*arc
tanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(
c^2*d-e)-1/2*c^2*b*(d*e)^(1/2)*d/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^
2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+1/4*c^4*b*(d*e)^(1/2)/e^2*
d^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(
1/2))/(c^2*d-e)^2+b*x*arctan(c*x)/e+1/2*b*(d*e)^(1/2)/e*arctanh(1/4*(2*(c^2
*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)+1/8*c^5
*b/e^2*d^3/(c^2*d-e)^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)
^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*
e-e)-2*c*b/e*d/(c^2*d-e)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))+1/8*c^3*b/e^2*d^2/
(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1
)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+3/8/c^2*
b*(d*e)^(1/2)/d/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+
2*e)/c/(d*e)^(1/2))+3/4/c^2*b*(d*e)^(1/2)/d*arctanh(1/4*(2*(c^2*d-e)*(1+I*c
*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)-1/4*c*b/e*d/(c^2*d-
e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*
c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+1/8*c^3*b/e*d^2
/(c^2*d-e)^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^
2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-1/8*c
^2*b*(d*e)^(1/2)/e^3*d*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c
^2*d+2*e)/c/(d*e)^(1/2))+1/8/c*b/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2
*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I
*c*x)^2/(c^2*x^2+1)*e-e)+1/c*b/e*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/4/c*b/e*ln
((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^
4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+2/c*b/(c^2*d-e)*ln((
1+I*c*x)/(c^2*x^2+1)^(1/2))-1/4*b*(d*e)^(1/2)*arctanh(1/4*(2*(c^2*d-e)*(1+I
*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+3/4*b*(d*e)^(1/
2)/e^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e
)^(1/2))+3/8/c^2*b*(d*e)^(1/2)/d*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^
```

```
2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2-a*d/e/(d*e)^(1/2)*arctan(e
*x/(d*e)^(1/2))+I/c*b*arctan(c*x)/e+3/8/c*b*e/(c^2*d-e)^2*ln((1+I*c*x)^4/(c
^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2
*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+1/4*c*b/e^2*d*sum((_R1^2*c^2*d-_R1^
2*e+c^2*d+3*e)/(_R1^2*c^2*d-_R1^2*e+c^2*d+e)*(I*arctan(c*x)*ln((_R1-(1+I*c*
x)/(c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)),_R
1=RootOf((c^2*d-e)*_Z^4+(2*c^2*d+2*e)*_Z^2+c^2*d-e))-1/4*c*b/e^2*d*sum((_R1
^2*c^2*d-_R1^2*e+c^2*d-e)/(_R1^2*c^2*d-_R1^2*e+c^2*d+e)*(I*arctan(c*x)*ln((
_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2
))/_R1)),_R1=RootOf((c^2*d-e)*_Z^4+(2*c^2*d+2*e)*_Z^2+c^2*d-e))-5/8*c*b*d/(
c^2*d-e)^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+
1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-1/4*c*b
/e^2*d*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(
1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+a*x/e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{d\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,e}-\frac{x}{e}\right)+2\,b\int\frac{x^2\arctan\left(cx\right)}{2\left(ex^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -a*(d*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e) - x/e) + 2*b*integrate(1/2*x^2*ar
ctan(c*x)/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + e*x^2),x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^2\left(a+b\,\mathrm{atan}\left(cx\right)\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(e*x**2+d),x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))/(d + e*x**2), x)
```

3.1156 $\int \frac{a+b\tan^{-1}(cx)}{d+ex^2}\,dx$

Optimal. Leaf size=517

$$\frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,\sqrt{e}}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,(i-cx)}{\sqrt{-d}\,c+i\sqrt{e}}\right)}{4\sqrt{-d}\,\sqrt{e}}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,(1-icx)}{i\sqrt{-d}\,c+\sqrt{e}}\right)}{4\sqrt{-d}\,\sqrt{e}}-\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,(icx+1)}{i\sqrt{-d}\,c+\sqrt{e}}\right)}{4\sqrt{-d}\,\sqrt{e}}+\frac{ib\text{Li}_2\left(\frac{\sqrt{e}\,(cx+i)}{\sqrt{-d}\,c+i\sqrt{e}}\right)}{4\sqrt{-d}\,\sqrt{e}}-\frac{ib\log(1+icx)\log\left(\frac{c}{}\right.}{4\sqrt{-d}\,\sqrt{e}}$$

```
[Out] -1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2))/(c*(-d)^(1/2)-I*e^(1/2)))/
(-d)^(1/2)/e^(1/2)+1/4*I*b*ln(1-I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2))/(c*(-d)^
(1/2)+I*e^(1/2)))/(-d)^(1/2)/e^(1/2)-1/4*I*b*ln(1-I*c*x)*ln(c*((-d)^(1/2)+x
*e^(1/2))/(c*(-d)^(1/2)-I*e^(1/2)))/(-d)^(1/2)/e^(1/2)+1/4*I*b*ln(1+I*c*x)*
ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(1/2)/e^(1/2)+1/
4*I*b*polylog(2,(I-c*x)*e^(1/2)/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(1/2)/e^(1/2
)+1/4*I*b*polylog(2,(I+c*x)*e^(1/2)/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(1/2)/e^
(1/2)-1/4*I*b*polylog(2,(1-I*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+e^(1/2)))/(-d)^(1
/2)/e^(1/2)-1/4*I*b*polylog(2,(1+I*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+e^(1/2)))/(
-d)^(1/2)/e^(1/2)+a*arctan(x*e^(1/2)/d^(1/2))/d^(1/2)/e^(1/2)
```

Rubi [A] time = 0.41, antiderivative size = 517, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 7, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.389$, Rules used = {4910, 205, 4908, 2409, 2394, 2393, 2391}

$$\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}\,(-cx+i)}{c\sqrt{-d}+i\sqrt{e}}\right)}{4\sqrt{-d}\,\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}\,(1-icx)}{\sqrt{e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}\,\sqrt{e}}-\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}\,(1+icx)}{\sqrt{e}+ic\sqrt{-d}}\right)}{4\sqrt{-d}\,\sqrt{e}}+\frac{ib\text{PolyLog}\left(2,\frac{\sqrt{e}\,(cx+i)}{c\sqrt{-d}+i\sqrt{e}}\right)}{4\sqrt{-d}\,\sqrt{e}}+\frac{a\tan}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + e*x^2),x]
```

```
[Out] (a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(Sqrt[d]*Sqrt[e]) - ((I/4)*b*Log[1 + I*c*x]
*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])])/(Sqrt[-d]*Sqrt[e
]) + ((I/4)*b*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I
*Sqrt[e])])/(Sqrt[-d]*Sqrt[e]) - ((I/4)*b*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] +
 Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])])/(Sqrt[-d]*Sqrt[e]) + ((I/4)*b*Log[1
 + I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(Sqrt[-
d]*Sqrt[e]) + ((I/4)*b*PolyLog[2, (Sqrt[e]*(I - c*x))/(c*Sqrt[-d] + I*Sqrt[
e])])/(Sqrt[-d]*Sqrt[e]) - ((I/4)*b*PolyLog[2, (Sqrt[e]*(1 - I*c*x))/(I*c*S
qrt[-d] + Sqrt[e])])/(Sqrt[-d]*Sqrt[e]) - ((I/4)*b*PolyLog[2, (Sqrt[e]*(1 +
 I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])])/(Sqrt[-d]*Sqrt[e]) + ((I/4)*b*PolyLog[2
, (Sqrt[e]*(I + c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(Sqrt[-d]*Sqrt[e])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rubi steps

$$
\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{d+ex^2}\,dx &= a\int \frac{1}{d+ex^2}\,dx + b\int \frac{\tan^{-1}(cx)}{d+ex^2}\,dx \\
&= \frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}} + \frac{1}{2}(ib)\int \frac{\log(1-icx)}{d+ex^2}\,dx - \frac{1}{2}(ib)\int \frac{\log(1+icx)}{d+ex^2}\,dx \\
&= \frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}} + \frac{1}{2}(ib)\int \left(\frac{\sqrt{-d}\log(1-icx)}{2d\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\sqrt{-d}\log(1-icx)}{2d\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx - \frac{1}{2}(ib)\int \Bigg(\frac{\sqrt{-}}{2d}\\
&= \frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}} - \frac{(ib)\int \frac{\log(1-icx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{4\sqrt{-d}} - \frac{(ib)\int \frac{\log(1-icx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{4\sqrt{-d}} + \frac{(ib)\int \frac{\log(1+icx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{4\sqrt{-d}} + \frac{(ib)\int}{} \\
&= \frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}} - \frac{ib\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4\sqrt{-d}\sqrt{e}} + \frac{ib\log(1-icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}+i\sqrt{e}}\right)}{4\sqrt{-d}\sqrt{e}} - \\
&= \frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}} - \frac{ib\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4\sqrt{-d}\sqrt{e}} + \frac{ib\log(1-icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}+i\sqrt{e}}\right)}{4\sqrt{-d}\sqrt{e}} - \\
&= \frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\sqrt{e}} - \frac{ib\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4\sqrt{-d}\sqrt{e}} + \frac{ib\log(1-icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}+i\sqrt{e}}\right)}{4\sqrt{-d}\sqrt{e}} -
\end{aligned}
$$

Mathematica [A] time = 0.25, size = 461, normalized size = 0.89

$$4a\sqrt{-d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)+ib\sqrt{d}\,\mathrm{Li}_2\left(\frac{\sqrt{e}(i-cx)}{\sqrt{-d}c+i\sqrt{e}}\right)-ib\sqrt{d}\,\mathrm{Li}_2\left(\frac{\sqrt{e}(1-icx)}{i\sqrt{-d}c+\sqrt{e}}\right)-ib\sqrt{d}\,\mathrm{Li}_2\left(\frac{\sqrt{e}(icx+1)}{i\sqrt{-d}c+\sqrt{e}}\right)+ib\sqrt{d}\,\mathrm{Li}_2\left(\frac{\sqrt{e}(cx+i)}{\sqrt{-d}c+i\sqrt{e}}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + e*x^2),x]
```

```
[Out] (4*a*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] - I*b*Sqrt[d]*Log[1 + I*c*x]*Log[
(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])] + I*b*Sqrt[d]*Log[1 -
I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])] - I*b*Sqrt[
d]*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])]
+ I*b*Sqrt[d]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] + I
*Sqrt[e])] + I*b*Sqrt[d]*PolyLog[2, (Sqrt[e]*(I - c*x))/(c*Sqrt[-d] + I*Sqr
t[e])] - I*b*Sqrt[d]*PolyLog[2, (Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] + Sqrt[
e])] - I*b*Sqrt[d]*PolyLog[2, (Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e]
)] + I*b*Sqrt[d]*PolyLog[2, (Sqrt[e]*(I + c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/
(4*Sqrt[-d^2]*Sqrt[e])
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\arctan(cx)+a}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e*x^2 + d), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.66, size = 886, normalized size = 1.71

$$\frac{a\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}+\frac{ic^3b\ln\left(1-\frac{(c^2d-e)(icx+1)^2}{(c^2x^2+1)\left(-c^2d-2\sqrt{c^2ed}-e\right)}\right)\arctan(cx)\sqrt{c^2ed}\,d}{2e\left(d^2c^4-2c^2ed+e^2\right)}-\frac{icb\ln\left(1-\frac{(c^2d-e)(icx+1)^2}{(c^2x^2+1)\left(-c^2d-2\sqrt{c^2ed}-e\right)}\right)\mathrm{arcta}}{d^2c^4-2c^2ed+e^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(e*x^2+d),x)
```

```
[Out] a/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/2*I*c^3*b*ln(1-(c^2*d-e)*(1+I*c*x)^
2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/e/(c^4*d^2-2*c^2*d*
e+e^2)*(c^2*e*d)^(1/2)*d-I*c*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2
*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2
)-1/2/c*b*(c^2*e*d)^(1/2)/e/d*arctan(c*x)^2-1/4/c*b*(c^2*e*d)^(1/2)/e/d*pol
ylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))-1/2*
I/c*b*(c^2*e*d)^(1/2)/e/d*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1
)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))+1/2*c^3*b/e/(c^4*d^2-2*c^2*d*e+e^2)*arctan(
c*x)^2*(c^2*e*d)^(1/2)*d-c*b/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^2*(c^2*e*d
```

```
)^(1/2)+1/2*I/c*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d
)^(1/2)-e))*arctan(c*x)/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*e+1/4*c^3
*b/e/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-
c^2*d-2*(c^2*e*d)^(1/2)-e))*(c^2*e*d)^(1/2)*d-1/2*c*b/(c^4*d^2-2*c^2*d*e+e^
2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e)
)*(c^2*e*d)^(1/2)+1/2/c*b/d/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^2*(c^2*e*d)
^(1/2)*e+1/4/c*b/d/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/
(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*(c^2*e*d)^(1/2)*e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$2\,b\int\frac{\arctan\left(cx\right)}{2\left(ex^2+d\right)}\,dx+\frac{a\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 2*b*integrate(1/2*arctan(c*x)/(e*x^2 + d), x) + a*arctan(e*x/sqrt(d*e))/sqr
t(d*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + e*x^2),x)
```

```
[Out] int((a + b*atan(c*x))/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{atan}\left(cx\right)}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(e*x**2+d),x)
```

```
[Out] Integral((a + b*atan(c*x))/(d + e*x**2), x)
```

3.1157 $\int \frac{a+b\tan^{-1}(cx)}{x^2(d+ex^2)}\,dx$

Optimal. Leaf size=561

$$-\frac{a+b\tan^{-1}(cx)}{dx}-\frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}}-\frac{bc\log\left(c^2x^2+1\right)}{2d}+\frac{ib\sqrt{e}\,\text{Li}_2\left(\frac{\sqrt{e}(i-cx)}{\sqrt{-d}c+i\sqrt{e}}\right)}{4(-d)^{3/2}}-\frac{ib\sqrt{e}\,\text{Li}_2\left(\frac{\sqrt{e}(1-icx)}{i\sqrt{-d}c+\sqrt{e}}\right)}{4(-d)^{3/2}}-\frac{ib\sqrt{e}\,\text{Li}_2\left(\frac{\sqrt{}}{i\sqrt{}}\right.}{4(-d)}$$

```
[Out] (-a-b*arctan(c*x))/d/x+b*c*ln(x)/d-1/2*b*c*ln(c^2*x^2+1)/d-a*arctan(x*e^(1/
2)/d^(1/2))*e^(1/2)/d^(3/2)-1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2))
/(c*(-d)^(1/2)-I*e^(1/2)))*e^(1/2)/(-d)^(3/2)+1/4*I*b*ln(1-I*c*x)*ln(c*((-d
)^(1/2)-x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(3/2)-1/4*I*b*ln(
1-I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)-I*e^(1/2)))*e^(1/2)/(-d)
^(3/2)+1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1
/2)))*e^(1/2)/(-d)^(3/2)+1/4*I*b*polylog(2,(I-c*x)*e^(1/2)/(c*(-d)^(1/2)+I*
e^(1/2)))*e^(1/2)/(-d)^(3/2)+1/4*I*b*polylog(2,(I+c*x)*e^(1/2)/(c*(-d)^(1/2
)+I*e^(1/2)))*e^(1/2)/(-d)^(3/2)-1/4*I*b*polylog(2,(1-I*c*x)*e^(1/2)/(I*c*(
-d)^(1/2)+e^(1/2)))*e^(1/2)/(-d)^(3/2)-1/4*I*b*polylog(2,(1+I*c*x)*e^(1/2)/
(I*c*(-d)^(1/2)+e^(1/2)))*e^(1/2)/(-d)^(3/2)
```

Rubi [A] time = 0.53, antiderivative size = 561, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {4918, 4852, 266, 36, 29, 31, 4910, 205, 4908, 2409, 2394, 2393, 2391}

$$\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}(-cx+i)}{c\sqrt{-d}+i\sqrt{e}}\right)}{4(-d)^{3/2}}-\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}(1-icx)}{\sqrt{e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}}-\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}(1+icx)}{\sqrt{e}+ic\sqrt{-d}}\right)}{4(-d)^{3/2}}+\frac{ib\sqrt{e}\,\text{PolyLog}\left(2,\frac{\sqrt{e}}{c\sqrt{-}}\right.}{4(-d)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)),x]
```

```
[Out] -((a + b*ArcTan[c*x])/(d*x)) - (a*Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/d^(3
/2) + (b*c*Log[x])/d - ((I/4)*b*Sqrt[e]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - S
qrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])])/(-d)^(3/2) + ((I/4)*b*Sqrt[e]*Log[1 -
 I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(3/2
) - ((I/4)*b*Sqrt[e]*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[
-d] - I*Sqrt[e])])/(-d)^(3/2) + ((I/4)*b*Sqrt[e]*Log[1 + I*c*x]*Log[(c*(Sqr
t[-d] + Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(3/2) - (b*c*Log[1 + c^
2*x^2])/(2*d) + ((I/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*(I - c*x))/(c*Sqrt[-d]
 + I*Sqrt[e])])/(-d)^(3/2) - ((I/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*(1 - I*c*
x))/(I*c*Sqrt[-d] + Sqrt[e])])/(-d)^(3/2) - ((I/4)*b*Sqrt[e]*PolyLog[2, (Sq
rt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])])/(-d)^(3/2) + ((I/4)*b*Sqrt[e]
*PolyLog[2, (Sqrt[e]*(I + c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(3/2)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
```

```
x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2\left(d+ex^2\right)}\,dx = \frac{\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{d+ex^2}\,dx}{d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} + \frac{(bc)\int \frac{1}{x\left(1+c^2x^2\right)}\,dx}{d} - \frac{(ae)\int \frac{1}{d+ex^2}\,dx}{d} - \frac{(be)\int \frac{\tan^{-1}(cx)}{d+ex^2}\,dx}{d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{a\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}} + \frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{x\left(1+c^2x\right)}\,dx,x,x^2\right)}{2d} - \frac{(ibe)\int \frac{\log(1-ic}{d+ex^2}}{2d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{a\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}} + \frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{x}\,dx,x,x^2\right)}{2d} - \frac{\left(bc^3\right)\mathrm{Subst}\left(\int \frac{1}{1+c^2x}\right.}{2d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{a\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bc\log(x)}{d} - \frac{bc\log\left(1+c^2x^2\right)}{2d} - \frac{(ibe)\int \frac{\log(1-icx)}{\sqrt{-d}-\sqrt{e}x}}{4(-d)^{3/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{a\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bc\log(x)}{d} - \frac{ib\sqrt{e}\,\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4(-d)^{3/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{a\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bc\log(x)}{d} - \frac{ib\sqrt{e}\,\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4(-d)^{3/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx} - \frac{a\sqrt{e}\,\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}} + \frac{bc\log(x)}{d} - \frac{ib\sqrt{e}\,\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4(-d)^{3/2}}$$

Mathematica [A] time = 0.82, size = 468, normalized size = 0.83

$$-\frac{\sqrt{e}\left(4a\sqrt{-d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)+ib\sqrt{d}\left(\mathrm{Li}_2\left(\frac{\sqrt{e}(i-cx)}{\sqrt{-d}c+i\sqrt{e}}\right)+\log(1+icx)\log\left(\frac{c\left(\sqrt{-d}+\sqrt{e}x\right)}{c\sqrt{-d}+i\sqrt{e}}\right)\right)-ib\sqrt{d}\left(\mathrm{Li}_2\left(\frac{\sqrt{e}(1-icx)}{i\sqrt{-d}c+\sqrt{e}}\right)+\log(1-icx)\log\left(\frac{c\left(\sqrt{-d}+\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)\right)-ib\sqrt{d}\left(\mathrm{Li}_2\right.}{4\sqrt{-d^2}}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)),x]
```

```
[Out] (-((a + b*ArcTan[c*x])/x) + b*c*Log[x] - (b*c*Log[1 + c^2*x^2])/2 - (Sqrt[e
]*(4*a*Sqrt[-d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]] + I*b*Sqrt[d]*(Log[1 + I*c*x]*L
og[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])] + PolyLog[2, (Sqrt[
e]*(I - c*x))/(c*Sqrt[-d] + I*Sqrt[e])]) - I*b*Sqrt[d]*(Log[1 - I*c*x]*Log[
(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])] + PolyLog[2, (Sqrt[e]*
(1 - I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])]) - I*b*Sqrt[d]*(Log[1 + I*c*x]*Log[(
c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])] + PolyLog[2, (Sqrt[e]*(
1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])]) + I*b*Sqrt[d]*(Log[1 - I*c*x]*Log[(c
*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])] + PolyLog[2, (Sqrt[e]*(I
 + c*x))/(c*Sqrt[-d] + I*Sqrt[e])])))/(4*Sqrt[-d^2]))/d
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{ex^4+dx^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b*arctan(c*x) + a)/(e*x^4 + d*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d),x, algorithm="giac")
[Out] sage0*x
```

maple [C] time = 0.84, size = 2439, normalized size = 4.35

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(e*x^2+d),x)
[Out] 1/8*b/c^2*(d*e)^(1/2)/d^3*e^3*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2
+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+3/8*b*c^6*(d*e)^(1/2)*d/e*arcta
nh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^
2*d-e)^2-1/2*b*c^2*(d*e)^(1/2)/d*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^
2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+c*b/d*ln(1+(1+I*c*x)/(c^2*
x^2+1)^(1/2))+c*b/d*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)-1/4*c*b/d*ln((1+I*c*x
)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^
2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-2*b*c^3/(c^2*d-e)*ln((1+I*c*x
)/(c^2*x^2+1)^(1/2))-1/8*b*c^3/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d
+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c
*x)^2/(c^2*x^2+1)*e-e)+3/4*b*(d*e)^(1/2)/d^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*
c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))-b*arctan(c*x)/x/d-a/d/x+5/4*
b*(d*e)^(1/2)/d^2*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*
d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)+1/4*b*(d*e)^(1/2)/d^2*e^2*arctanh(1/4*(2*(c
^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2-1/8
*b/c^2*(d*e)^(1/2)/d^3*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2
*c^2*d+2*e)/c/(d*e)^(1/2))+1/4*c*b/d*e/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)
^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+
2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+1/8*c*b/d*e^2/(c^2*d-e)^2*ln((1+I*c*x)^4/(c^
2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*
e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+2*c*b/d*e/(c^2*d-e)*ln((1+I*c*x)/(c^
2*x^2+1)^(1/2))-3/4*b*c^4*(d*e)^(1/2)/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^
2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)+3/8*b*c^2*(d*e)^(1/2)/d
/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1
/2))-1/2*b*c^2*(d*e)^(1/2)/d*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+
1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)+1/8*b/c/d^2*e^3/(c^2*d-e)^2*ln((1+
I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c
^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-1/8*b/c/d^2*e^2/(c^2*d-e
)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c
*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+1/4*b/c/d^2*e*su
m((_R1^2*c^2*d-_R1^2*e+3*c^2*d+e)/(_R1^2*c^2*d-_R1^2*e+c^2*d+e)*(I*arctan(c
*x)*ln((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)+dilog((_R1-(1+I*c*x)/(c^2*x^2
+1)^(1/2))/_R1)),_R1=RootOf((c^2*d-e)*_Z^4+(2*c^2*d+2*e)*_Z^2+c^2*d-e))-a*e
```

```
/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/4*b/c/d^2*e*ln((1+I*c*x)^4/(c^2*x^
2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^
2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-1/4*b/c/d^2*e*sum((_R1^2*c^2*d-_R1^2*e-c
^2*d+e)/(_R1^2*c^2*d-_R1^2*e+c^2*d+e)*(I*arctan(c*x)*ln((_R1-(1+I*c*x)/(c^2
*x^2+1)^(1/2))/_R1)+dilog((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)),_R1=RootO
f((c^2*d-e)*_Z^4+(2*c^2*d+2*e)*_Z^2+c^2*d-e))-5/8*b*c^3*e/(c^2*d-e)^2*ln((1
+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(
c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-1/4*b*c^4*(d*e)^(1/2)*a
rctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))
/(c^2*d-e)^2+3/8*b*c^5*d/(c^2*d-e)^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c
^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^
2/(c^2*x^2+1)*e-e)+I*c*b*arctan(c*x)/d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{e\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d}+\frac{1}{dx}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(ex^4+dx^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -a*(e*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d) + 1/(d*x)) + 2*b*integrate(1/2*ar
ctan(c*x)/(e*x^4 + d*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^2\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + e*x^2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{atan}\left(cx\right)}{x^2\left(d+ex^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x**2*(d + e*x**2)), x)
```

3.1158 $\int \frac{x^3(a+b\tan^{-1}(cx))}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=403

$$\frac{d\left(a+b\tan^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2e^2}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2e^2}-\log\Bigg($$

```
[Out] -1/2*b*c^2*d*arctan(c*x)/(c^2*d-e)/e^2+1/2*d*(a+b*arctan(c*x))/e^2/(e*x^2+d
)-(a+b*arctan(c*x))*ln(2/(1-I*c*x))/e^2+1/2*(a+b*arctan(c*x))*ln(2*c*((-d)^
(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2+1/2*(a+b*arctan(c*
x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2+1
/2*I*b*polylog(2,1-2/(1-I*c*x))/e^2-1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)-x*e
^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2-1/4*I*b*polylog(2,1-2*c*((-
d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2+1/2*b*c*arctan(
x*e^(1/2)/d^(1/2))*d^(1/2)/(c^2*d-e)/e^(3/2)
```

Rubi [A] time = 0.45, antiderivative size = 403, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 9, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.429, Rules used = {4980, 4974, 391, 203, 205, 4856, 2402, 2315, 2447}

$$-\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4e^2}-\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4e^2}+\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e^2}+\frac{d\left(a+\right.}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -(b*c^2*d*ArcTan[c*x])/(2*(c^2*d - e)*e^2) + (d*(a + b*ArcTan[c*x]))/(2*e^2
*(d + e*x^2)) + (b*c*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*(c^2*d - e)*e^
(3/2)) - ((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e^2 + ((a + b*ArcTan[c*x]
)*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])
/(2*e^2) + ((a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-
d] + I*Sqrt[e])*(1 - I*c*x))])/(2*e^2) + ((I/2)*b*PolyLog[2, 1 - 2/(1 - I*c
*x)])/e^2 - ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-
d] - I*Sqrt[e])*(1 - I*c*x))])/e^2 - ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d]
 + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/e^2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 391

```
Int[1/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))), x_Symbol] :> Dis
t[b/(b*c - a*d), Int[1/(a + b*x^n), x], x] - Dist[d/(b*c - a*d), Int[1/(c +
 d*x^n), x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx=\int \left(-\frac{dx\left(a+b\tan^{-1}(cx)\right)}{e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{e\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx}{e}-\frac{d\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{e}$$

$$=\frac{d\left(a+b\tan^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)}-\frac{(bcd)\int \frac{1}{\left(1+c^2x^2\right)\left(d+ex^2\right)}\,dx}{2e^2}+\frac{\int \left(-\frac{a+b\tan^{-1}(cx)}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{a+b\tan^{-1}(\right.}{2\sqrt{e}\left(\sqrt{-d}+\right.}}{e}$$

$$=\frac{d\left(a+b\tan^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)}-\frac{\left(bc^3d\right)\int \frac{1}{1+c^2x^2}\,dx}{2\left(c^2d-e\right)e^2}-\frac{\int \frac{a+b\tan^{-1}(cx)}{\sqrt{-d}-\sqrt{e}x}\,dx}{2e^{3/2}}+\frac{\int \frac{a+b\tan^{-1}(cx)}{\sqrt{-d}+\sqrt{e}x}\,dx}{2e^{3/2}}+$$

$$=-\frac{bc^2d\tan^{-1}(cx)}{2\left(c^2d-e\right)e^2}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)}+\frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\left(c^2d-e\right)e^{3/2}}-\frac{\left(a+b\tan^{-1}(cx)\right)}{e^2}$$

$$=-\frac{bc^2d\tan^{-1}(cx)}{2\left(c^2d-e\right)e^2}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)}+\frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\left(c^2d-e\right)e^{3/2}}-\frac{\left(a+b\tan^{-1}(cx)\right)}{e^2}$$

$$=-\frac{bc^2d\tan^{-1}(cx)}{2\left(c^2d-e\right)e^2}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{2e^2\left(d+ex^2\right)}+\frac{bc\sqrt{d}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\left(c^2d-e\right)e^{3/2}}-\frac{\left(a+b\tan^{-1}(cx)\right)}{e^2}$$

Mathematica [A] time = 8.47, size = 522, normalized size = 1.30

$$2a\left(\frac{d}{d+ex^2}+\log\left(d+ex^2\right)\right)+b\left(-\frac{2c^2d\tan^{-1}(cx)}{c^2d-e}+\frac{2c\sqrt{d}\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{c^2d-e}-i\text{Li}_2\left(\frac{c\left(\sqrt{d}-i\sqrt{e}x\right)}{c\sqrt{d}-\sqrt{e}}\right)+i\text{Li}_2\left(\frac{c\left(\sqrt{d}-i\sqrt{e}x\right)}{\sqrt{d}c+\sqrt{e}}\right)+i\text{Li}_2\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (2*a*(d/(d + e*x^2) + Log[d + e*x^2]) + b*((-2*c^2*d*ArcTan[c*x])/(c^2*d -
e) + (2*d*ArcTan[c*x])/(d + e*x^2) + (2*c*Sqrt[d]*Sqrt[e]*ArcTan[(Sqrt[e]*x
)/Sqrt[d]])/(c^2*d - e) + 2*ArcTan[c*x]*Log[((-I)*Sqrt[d])/Sqrt[e] + x] + 2
*ArcTan[c*x]*Log[(I*Sqrt[d])/Sqrt[e] + x] + I*Log[((-I)*Sqrt[d])/Sqrt[e] +
x]*Log[(Sqrt[e]*(-1 - I*c*x))/(c*Sqrt[d] - Sqrt[e])] - I*Log[((-I)*Sqrt[d])
/Sqrt[e] + x]*Log[(Sqrt[e]*(1 - I*c*x))/(c*Sqrt[d] + Sqrt[e])] - I*Log[(I*S
qrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(-1 + I*c*x))/(c*Sqrt[d] - Sqrt[e])] + I*
Log[(I*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1 + I*c*x))/(c*Sqrt[d] + Sqrt[e]
)] - I*PolyLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])] + I*Po
lyLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sqrt[d] + Sqrt[e])] + I*PolyLog[2,
(c*(Sqrt[d] + I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])] - I*PolyLog[2, (c*(Sqrt[
d] + I*Sqrt[e]*x))/(c*Sqrt[d] + Sqrt[e])]))/(4*e^2)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^3\arctan\left(cx\right)+ax^3}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^3*arctan(c*x) + a*x^3)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.37, size = 760, normalized size = 1.89

$$\frac{c^2ad}{2e^2\left(c^2e\,x^2+c^2d\right)}+\frac{a\ln\left(c^2e\,x^2+c^2d\right)}{2e^2}+\frac{c^2b\arctan\left(cx\right)d}{2e^2\left(c^2e\,x^2+c^2d\right)}+\frac{b\arctan\left(cx\right)\ln\left(c^2e\,x^2+c^2d\right)}{2e^2}+\frac{ib\operatorname{dilog}\left(\frac{\mathrm{RootOf}\left(e\_Z^2-2\right.}{\mathrm{RootOf}\left(e\_Z\right.}\right.}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^2,x)
```

```
[Out] 1/2*c^2*a/e^2*d/(c^2*e*x^2+c^2*d)+1/2*a/e^2*ln(c^2*e*x^2+c^2*d)+1/2*c^2*b*a
rctan(c*x)/e^2*d/(c^2*e*x^2+c^2*d)+1/2*b*arctan(c*x)/e^2*ln(c^2*e*x^2+c^2*d
)-1/4*I*b/e^2*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/
RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/e^2*dilog((RootOf(e*_Z^2+2
*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))+1/
4*I*b/e^2*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/Root
Of(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))+1/4*I*b/e^2*dilog((RootOf(e*_Z^2-2*I*_
Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))-1/4*I*
b/e^2*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e
*_Z^2+2*I*_Z*e+c^2*d-e,index=2))+1/4*I*b/e^2*dilog((RootOf(e*_Z^2-2*I*_Z*e+
c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/e^
2*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_
Z*e+c^2*d-e,index=2))+1/4*I*b/e^2*ln(c*x-I)*ln(c^2*e*x^2+c^2*d)-1/4*I*b/e^2
*ln(I+c*x)*ln(c^2*e*x^2+c^2*d)+1/4*I*b/e^2*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*
_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+1/2*c
*b/e*d/(c^2*d-e)/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/2*b*c^2*d*arctan(c*x
)/(c^2*d-e)/e^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a\left(\frac{d}{e^3x^2+de^2}+\frac{\log\left(ex^2+d\right)}{e^2}\right)+2\,b\int\frac{x^3\arctan\left(cx\right)}{2\left(e^2x^4+2\,dex^2+d^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(d/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/e^2) + 2*b*integrate(1/2*x^3*ar
ctan(c*x)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1159 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=91

$$-\frac{a+b\tan^{-1}(cx)}{2e\left(d+ex^2\right)}+\frac{bc^2\tan^{-1}(cx)}{2e\left(c^2d-e\right)}-\frac{bc\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,\sqrt{e}\,\left(c^2d-e\right)}$$

```
[Out] 1/2*b*c^2*arctan(c*x)/(c^2*d-e)/e+1/2*(-a-b*arctan(c*x))/e/(e*x^2+d)-1/2*b*
c*arctan(x*e^(1/2)/d^(1/2))/(c^2*d-e)/d^(1/2)/e^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 91, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {4974, 391, 203, 205}

$$-\frac{a+b\tan^{-1}(cx)}{2e\left(d+ex^2\right)}+\frac{bc^2\tan^{-1}(cx)}{2e\left(c^2d-e\right)}-\frac{bc\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,\sqrt{e}\,\left(c^2d-e\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (b*c^2*ArcTan[c*x])/(2*(c^2*d - e)*e) - (a + b*ArcTan[c*x])/(2*e*(d + e*x^2
)) - (b*c*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]*(c^2*d - e)*Sqrt[e])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 391

```
Int[1/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))), x_Symbol] :> Dis
t[b/(b*c - a*d), Int[1/(a + b*x^n), x], x] - Dist[d/(b*c - a*d), Int[1/(c +
 d*x^n), x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx=-\frac{a+b\tan^{-1}(cx)}{2e\left(d+ex^2\right)}+\frac{(bc)\int\frac{1}{(1+c^2x^2)(d+ex^2)}\,dx}{2e}$$
$$=-\frac{a+b\tan^{-1}(cx)}{2e\left(d+ex^2\right)}-\frac{(bc)\int\frac{1}{d+ex^2}\,dx}{2\left(c^2d-e\right)}+\frac{\left(bc^3\right)\int\frac{1}{1+c^2x^2}\,dx}{2\left(c^2d-e\right)e}$$
$$=\frac{bc^2\tan^{-1}(cx)}{2\left(c^2d-e\right)e}-\frac{a+b\tan^{-1}(cx)}{2e\left(d+ex^2\right)}-\frac{bc\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\left(c^2d-e\right)\sqrt{e}}$$

Mathematica [A] time = 0.16, size = 98, normalized size = 1.08

$$\frac{a\sqrt{d}\left(c^2d-e\right)-b\sqrt{d}\,e\left(c^2x^2+1\right)\tan^{-1}(cx)+bc\sqrt{e}\left(d+ex^2\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\sqrt{d}\,e\left(e-c^2d\right)\left(d+ex^2\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a*Sqrt[d]*(c^2*d - e) - b*Sqrt[d]*e*(1 + c^2*x^2)*ArcTan[c*x] + b*c*Sqrt[e
]*(d + e*x^2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]*e*(-(c^2*d) + e)*(d +
 e*x^2))
```

fricas [A] time = 0.53, size = 234, normalized size = 2.57

$$\left[-\frac{2\,ac^2d^2-2\,ade-\left(bcex^2+bcd\right)\sqrt{-de}\,\log\left(\frac{ex^2-2\,\sqrt{-de}\,x-d}{ex^2+d}\right)-2\left(bc^2dex^2+bde\right)\arctan(cx)}{4\left(c^2d^3e-d^2e^2+\left(c^2d^2e^2-de^3\right)x^2\right)},-\frac{ac^2d^2-ade+(b\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] [-1/4*(2*a*c^2*d^2 - 2*a*d*e - (b*c*e*x^2 + b*c*d)*sqrt(-d*e)*log((e*x^2 -
2*sqrt(-d*e)*x - d)/(e*x^2 + d)) - 2*(b*c^2*d*e*x^2 + b*d*e)*arctan(c*x))/(
c^2*d^3*e - d^2*e^2 + (c^2*d^2*e^2 - d*e^3)*x^2), -1/2*(a*c^2*d^2 - a*d*e +
 (b*c*e*x^2 + b*c*d)*sqrt(d*e)*arctan(sqrt(d*e)*x/d) - (b*c^2*d*e*x^2 + b*d
*e)*arctan(c*x))/(c^2*d^3*e - d^2*e^2 + (c^2*d^2*e^2 - d*e^3)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.04, size = 109, normalized size = 1.20

$$-\frac{c^2a}{2e\left(c^2e\,x^2+c^2d\right)}-\frac{c^2b\arctan(cx)}{2e\left(c^2e\,x^2+c^2d\right)}-\frac{cb\arctan\left(\frac{ex}{\sqrt{de}}\right)}{2\left(c^2d-e\right)\sqrt{de}}+\frac{b\,c^2\arctan(cx)}{2\left(c^2d-e\right)e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(e*x^2+d)^2,x)
```

```
[Out] -1/2*c^2*a/e/(c^2*e*x^2+c^2*d)-1/2*c^2*b/e/(c^2*e*x^2+c^2*d)*arctan(c*x)-1/
2*c*b/(c^2*d-e)/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/2*b*c^2*arctan(c*x)/(
c^2*d-e)/e
```

maxima [A] time = 0.43, size = 90, normalized size = 0.99

$$\frac{1}{2}\left(c\left(\frac{c\arctan\left(cx\right)}{c^2de-e^2}-\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\left(c^2d-e\right)\sqrt{de}}\right)-\frac{\arctan\left(cx\right)}{e^2x^2+de}\right)b-\frac{a}{2\left(e^2x^2+de\right)}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*(c*(c*arctan(c*x)/(c^2*d*e - e^2) - arctan(e*x/sqrt(d*e))/((c^2*d - e)*
sqrt(d*e))) - arctan(c*x)/(e^2*x^2 + d*e))*b - 1/2*a/(e^2*x^2 + d*e)
```

mupad [B] time = 0.85, size = 696, normalized size = 7.65

$$\frac{b\,c\,\ln\left(e\,x+\sqrt{-d\,e}\right)\,\sqrt{-d\,e}}{4\,d\,e^2-4\,c^2\,d^2\,e}-\frac{2\,b\,c^2\,\mathrm{atan}\left(-\frac{\frac{c^2\left(c^8\,e\,x+\frac{c^2\left(2\,c^5\,e^3-4\,c^7\,d\,e^2+2\,c^9\,d^2\,e+\frac{c^2\,x\left(8\,c^{10}\,d^3\,e^2-8\,c^8\,d^2\,e^3-8\,c^6\,d\,e^4+8\,c^4\,e^5\right)1i}{4\,e^2-4\,c^2\,d\,e}\right)1i}{4\,e^2-4\,c^2\,d\,e}\right)}{4\,e^2-4\,c^2\,d\,e}-\frac{c^2\left(-c^8\,e\,x+\cdots\right.}{\cdots}}{\frac{c^2\left(c^8\,e\,x+\frac{c^2\left(2\,c^5\,e^3-4\,c^7\,d\,e^2+2\,c^9\,d^2\,e+\frac{c^2\,x\left(8\,c^{10}\,d^3\,e^2-8\,c^8\,d^2\,e^3-8\,c^6\,d\,e^4+8\,c^4\,e^5\right)1i}{4\,e^2-4\,c^2\,d\,e}\right)1i}{4\,e^2-4\,c^2\,d\,e}\right)1i}{4\,e^2-4\,c^2\,d\,e}+\frac{c^2\left(-c^8\,e\,x+\cdots\right.}{\cdots}}\right.\cdots}{4\,e^2-4\,c^2\,d\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + e*x^2)^2,x)
```

```
[Out] (b*c*log(e*x + (-d*e)^(1/2))*(-d*e)^(1/2))/(4*d*e^2 - 4*c^2*d^2*e) - (2*b*c
^2*atan(-((c^2*((c^2*(2*c^5*e^3 - 4*c^7*d*e^2 + 2*c^9*d^2*e + (c^2*x*(8*c^4
*e^5 - 8*c^6*d*e^4 - 8*c^8*d^2*e^3 + 8*c^10*d^3*e^2)*1i)/(4*e^2 - 4*c^2*d*e
))*1i)/(4*e^2 - 4*c^2*d*e) + c^8*e*x))/(4*e^2 - 4*c^2*d*e) - (c^2*((c^2*(2*
c^5*e^3 - 4*c^7*d*e^2 + 2*c^9*d^2*e - (c^2*x*(8*c^4*e^5 - 8*c^6*d*e^4 - 8*c
^8*d^2*e^3 + 8*c^10*d^3*e^2)*1i)/(4*e^2 - 4*c^2*d*e))*1i)/(4*e^2 - 4*c^2*d*
e) - c^8*e*x))/(4*e^2 - 4*c^2*d*e))/((c^2*((c^2*(2*c^5*e^3 - 4*c^7*d*e^2 +
2*c^9*d^2*e + (c^2*x*(8*c^4*e^5 - 8*c^6*d*e^4 - 8*c^8*d^2*e^3 + 8*c^10*d^3*
e^2)*1i)/(4*e^2 - 4*c^2*d*e))*1i)/(4*e^2 - 4*c^2*d*e) + c^8*e*x)*1i)/(4*e^2
 - 4*c^2*d*e) + (c^2*((c^2*(2*c^5*e^3 - 4*c^7*d*e^2 + 2*c^9*d^2*e - (c^2*x*
(8*c^4*e^5 - 8*c^6*d*e^4 - 8*c^8*d^2*e^3 + 8*c^10*d^3*e^2)*1i)/(4*e^2 - 4*c
^2*d*e))*1i)/(4*e^2 - 4*c^2*d*e) - c^8*e*x)*1i)/(4*e^2 - 4*c^2*d*e))))/(4*e
^2 - 4*c^2*d*e) - (b*atan(c*x))/(2*e*(d + e*x^2)) - (b*c*log(e*x - (-d*e)^(
1/2))*(-d*e)^(1/2))/(4*(d*e^2 - c^2*d^2*e)) - a/(2*d*e + 2*e^2*x^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1160 $\int \frac{a+b\tan^{-1}(cx)}{x(d+ex^2)^2}\,dx$

Optimal. Leaf size=443

$$-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2d^2}+\frac{\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(\right.}{d^2}$$

```
[Out] -1/2*b*c^2*arctan(c*x)/d/(c^2*d-e)+1/2*(a+b*arctan(c*x))/d/(e*x^2+d)+a*ln(x
)/d^2+(a+b*arctan(c*x))*ln(2/(1-I*c*x))/d^2-1/2*(a+b*arctan(c*x))*ln(2*c*((
-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2-1/2*(a+b*arcta
n(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d
^2+1/2*I*b*polylog(2,-I*c*x)/d^2-1/2*I*b*polylog(2,I*c*x)/d^2-1/2*I*b*polyl
og(2,1-2/(1-I*c*x))/d^2+1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I
*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2+1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)+x*e
^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^2+1/2*b*c*arctan(x*e^(1/2)/d^
(1/2))*e^(1/2)/d^(3/2)/(c^2*d-e)
```

Rubi [A] time = 0.49, antiderivative size = 443, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4980, 4848, 2391, 4974, 391, 203, 205, 4856, 2402, 2315, 2447}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4d^2}+\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4d^2}+\frac{ib\text{PolyLog}(2,-icx)}{2d^2}-\frac{ib\text{PolyLog}(2}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^2),x]
```

```
[Out] -(b*c^2*ArcTan[c*x])/(2*d*(c^2*d - e)) + (a + b*ArcTan[c*x])/(2*d*(d + e*x^
2)) + (b*c*Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(3/2)*(c^2*d - e)) + (
a*Log[x])/d^2 + ((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/d^2 - ((a + b*ArcT
an[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*
c*x))])/(2*d^2) - ((a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c
*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*d^2) + ((I/2)*b*PolyLog[2, (-I)*c*
x])/d^2 - ((I/2)*b*PolyLog[2, I*c*x])/d^2 - ((I/2)*b*PolyLog[2, 1 - 2/(1 -
I*c*x)])/d^2 + ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqr
t[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^2 + ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[
-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/d^2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 391

```
Int[1/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))), x_Symbol] :> Dis
t[b/(b*c - a*d), Int[1/(a + b*x^n), x], x] - Dist[d/(b*c - a*d), Int[1/(c +
 d*x^n), x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^2}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{d\left(d+ex^2\right)^2} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$= \frac{a+b\tan^{-1}(cx)}{2d\left(d+ex^2\right)} + \frac{a\log(x)}{d^2} + \frac{(ib)\int \frac{\log(1-icx)}{x}\,dx}{2d^2} - \frac{(ib)\int \frac{\log(1+icx)}{x}\,dx}{2d^2} - \frac{(bc)\int \frac{1}{(1+c^2x^2)(}}{2d}$$

$$= \frac{a+b\tan^{-1}(cx)}{2d\left(d+ex^2\right)} + \frac{a\log(x)}{d^2} + \frac{ib\text{Li}_2(-icx)}{2d^2} - \frac{ib\text{Li}_2(icx)}{2d^2} - \frac{\left(bc^3\right)\int \frac{1}{1+c^2x^2}\,dx}{2d\left(c^2d-e\right)} + \frac{\sqrt{e}\int \frac{a+}{\sqrt{}}}{2}$$

$$= -\frac{bc^2\tan^{-1}(cx)}{2d\left(c^2d-e\right)} + \frac{a+b\tan^{-1}(cx)}{2d\left(d+ex^2\right)} + \frac{bc\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\left(c^2d-e\right)} + \frac{a\log(x)}{d^2} + \frac{\left(a+b\tan^{-1}(cx)\right)}{d^2}$$

$$= -\frac{bc^2\tan^{-1}(cx)}{2d\left(c^2d-e\right)} + \frac{a+b\tan^{-1}(cx)}{2d\left(d+ex^2\right)} + \frac{bc\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\left(c^2d-e\right)} + \frac{a\log(x)}{d^2} + \frac{\left(a+b\tan^{-1}(cx)\right)}{d^2}$$

$$= -\frac{bc^2\tan^{-1}(cx)}{2d\left(c^2d-e\right)} + \frac{a+b\tan^{-1}(cx)}{2d\left(d+ex^2\right)} + \frac{bc\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{3/2}\left(c^2d-e\right)} + \frac{a\log(x)}{d^2} + \frac{\left(a+b\tan^{-1}(cx)\right)}{d^2}$$

Mathematica [A] time = 6.29, size = 590, normalized size = 1.33

$$\frac{2a\left(\frac{d}{d+ex^2} - \log\left(d+ex^2\right) + 2\log(x)\right) + b\left(-\frac{2c^2d\tan^{-1}(cx)}{c^2d-e} + \frac{2c\sqrt{d}\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{c^2d-e} + i\text{Li}_2\left(\frac{c\left(\sqrt{d}-i\sqrt{e}x\right)}{c\sqrt{d}-\sqrt{e}}\right) - i\text{Li}_2\left(\frac{c\left(\sqrt{d}-i\sqrt{}\right.}{\sqrt{d}c+\sqrt{}}\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^2),x]
```

```
[Out] (2*a*(d/(d + e*x^2) + 2*Log[x] - Log[d + e*x^2]) + b*((-2*c^2*d*ArcTan[c*x]
)/(c^2*d - e) + (2*d*ArcTan[c*x])/(d + e*x^2) + (2*c*Sqrt[d]*Sqrt[e]*ArcTan
[(Sqrt[e]*x)/Sqrt[d]])/(c^2*d - e) + 4*ArcTan[c*x]*Log[x] - 2*ArcTan[c*x]*L
og[((-I)*Sqrt[d])/Sqrt[e] + x] - 2*ArcTan[c*x]*Log[(I*Sqrt[d])/Sqrt[e] + x]
 - I*Log[((-I)*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(-1 - I*c*x))/(c*Sqrt[d]
- Sqrt[e])] - (2*I)*Log[x]*Log[1 - I*c*x] + I*Log[((-I)*Sqrt[d])/Sqrt[e] +
x]*Log[(Sqrt[e]*(1 - I*c*x))/(c*Sqrt[d] + Sqrt[e])] + I*Log[(I*Sqrt[d])/Sqr
t[e] + x]*Log[(Sqrt[e]*(-1 + I*c*x))/(c*Sqrt[d] - Sqrt[e])] + (2*I)*Log[x]*
Log[1 + I*c*x] - I*Log[(I*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1 + I*c*x))/(
c*Sqrt[d] + Sqrt[e])] + (2*I)*PolyLog[2, (-I)*c*x] - (2*I)*PolyLog[2, I*c*x
] + I*PolyLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])] - I*Pol
yLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sqrt[d] + Sqrt[e])] - I*PolyLog[2, (
c*(Sqrt[d] + I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])] + I*PolyLog[2, (c*(Sqrt[d
] + I*Sqrt[e]*x))/(c*Sqrt[d] + Sqrt[e])]))/(4*d^2)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{e^2x^5+2\,dex^3+d^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.30, size = 847, normalized size = 1.91

$$\frac{a\,c^2}{2d\left(c^2e\,x^2+c^2d\right)}-\frac{a\ln\left(c^2e\,x^2+c^2d\right)}{2d^2}+\frac{a\ln\left(cx\right)}{d^2}+\frac{b\,c^2\arctan\left(cx\right)}{2d\left(c^2e\,x^2+c^2d\right)}-\frac{b\arctan\left(cx\right)\ln\left(c^2e\,x^2+c^2d\right)}{2d^2}+\frac{b\arctan\left(cx\right)}{d^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(e*x^2+d)^2,x)
```

```
[Out] 1/2*a*c^2/d/(c^2*e*x^2+c^2*d)-1/2*a/d^2*ln(c^2*e*x^2+c^2*d)+a/d^2*ln(c*x)+1
/2*b*c^2*arctan(c*x)/d/(c^2*e*x^2+c^2*d)-1/2*b*arctan(c*x)/d^2*ln(c^2*e*x^2
+c^2*d)+b*arctan(c*x)/d^2*ln(c*x)+1/2*b*c/d*e/(c^2*d-e)/(d*e)^(1/2)*arctan(
e*x/(d*e)^(1/2))-1/2*b*c^2*arctan(c*x)/d/(c^2*d-e)-1/4*I*b/d^2*ln(c*x-I)*ln
(c^2*e*x^2+c^2*d)+1/4*I*b/d^2*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,
index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))-1/2*I*b/d^2*ln(c*x
)*ln(1-I*c*x)-1/4*I*b/d^2*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*
x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))+1/4*I*b/d^2*ln(c*x-I)*ln((Roo
tOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,
index=2))-1/2*I*b/d^2*dilog(1-I*c*x)-1/4*I*b/d^2*ln(I+c*x)*ln((RootOf(e*_Z^
2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))
+1/4*I*b/d^2*ln(I+c*x)*ln(c^2*e*x^2+c^2*d)-1/4*I*b/d^2*ln(I+c*x)*ln((RootOf
(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,ind
ex=1))-1/4*I*b/d^2*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/Ro
otOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+1/4*I*b/d^2*dilog((RootOf(e*_Z^2+2*I
*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))+1/2*
I*b/d^2*ln(c*x)*ln(1+I*c*x)+1/4*I*b/d^2*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d
-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))+1/2*I*b/d^2*dil
og(1+I*c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a\left(\frac{1}{dex^2+d^2}-\frac{\log\left(ex^2+d\right)}{d^2}+\frac{2\log(x)}{d^2}\right)+2b\int\frac{\arctan\left(cx\right)}{2\left(e^2x^5+2dex^3+d^2x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(1/(d*e*x^2 + d^2) - log(e*x^2 + d)/d^2 + 2*log(x)/d^2) + 2*b*integra
te(1/2*arctan(c*x)/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x\,{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + e*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1161 $\int \frac{a+b\tan^{-1}(cx)}{x^3(d+ex^2)^2}\,dx$

Optimal. Leaf size=489

$$-\frac{2e\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^3}+\frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{d^3}+\frac{e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{\ }\right.}{(1-icx)\left(c\sqrt{-d}\right.}\right.}{d^3}$$

```
[Out] -1/2*b*c/d^2/x-1/2*b*c^2*arctan(c*x)/d^2+1/2*b*c^2*e*arctan(c*x)/d^2/(c^2*d
-e)+1/2*(-a-b*arctan(c*x))/d^2/x^2-1/2*e*(a+b*arctan(c*x))/d^2/(e*x^2+d)-1/
2*b*c*e^(3/2)*arctan(x*e^(1/2)/d^(1/2))/d^(5/2)/(c^2*d-e)-2*a*e*ln(x)/d^3-2
*e*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/d^3+e*(a+b*arctan(c*x))*ln(2*c*((-d)^(
1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^3+e*(a+b*arctan(c*x))
*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^3-I*b*
e*polylog(2,-I*c*x)/d^3+I*b*e*polylog(2,I*c*x)/d^3+I*b*e*polylog(2,1-2/(1-I
*c*x))/d^3-1/2*I*b*e*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-
d)^(1/2)-I*e^(1/2)))/d^3-1/2*I*b*e*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(
1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^3
```

Rubi [A] time = 0.51, antiderivative size = 489, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {4980, 4852, 325, 203, 4848, 2391, 4974, 391, 205, 4856, 2402, 2315, 2447}

$$-\frac{ibe\text{PolyLog}(2,-icx)}{d^3}+\frac{ibe\text{PolyLog}(2,icx)}{d^3}+\frac{ibe\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{d^3}-\frac{ibe\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2d^3}-\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -(b*c)/(2*d^2*x) - (b*c^2*ArcTan[c*x])/(2*d^2) + (b*c^2*e*ArcTan[c*x])/(2*d
^2*(c^2*d - e)) - (a + b*ArcTan[c*x])/(2*d^2*x^2) - (e*(a + b*ArcTan[c*x]))
/(2*d^2*(d + e*x^2)) - (b*c*e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(5/2)
*(c^2*d - e)) - (2*a*e*Log[x])/d^3 - (2*e*(a + b*ArcTan[c*x])*Log[2/(1 - I*
c*x)])/d^3 + (e*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sq
rt[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^3 + (e*(a + b*ArcTan[c*x])*Log[(2*c*(S
qrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/d^3 - (I*b*e
*PolyLog[2, (-I)*c*x])/d^3 + (I*b*e*PolyLog[2, I*c*x])/d^3 + (I*b*e*PolyLog
[2, 1 - 2/(1 - I*c*x)])/d^3 - ((I/2)*b*e*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sq
rt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^3 - ((I/2)*b*e*PolyLog
[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))
])/d^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 391

```
Int[1/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))), x_Symbol] :> Dis
t[b/(b*c - a*d), Int[1/(a + b*x^n), x], x] - Dist[d/(b*c - a*d), Int[1/(c +
 d*x^n), x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^2}\,dx=\int\left(\frac{a+b\tan^{-1}(cx)}{d^2x^3}-\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^3x}+\frac{e^2x\left(a+b\tan^{-1}(cx)\right)}{d^2\left(d+ex^2\right)^2}+\frac{2e^2x\left(a+b\tan^{-1}(c\right.}{d^3\left(d+ex^2\right)}\right.$$

$$=\frac{\int\frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d^2}-\frac{(2e)\int\frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^3}+\frac{\left(2e^2\right)\int\frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx}{d^3}+\frac{e^2\int\frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}}{d^2}$$

$$=-\frac{a+b\tan^{-1}(cx)}{2d^2x^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)}-\frac{2ae\log(x)}{d^3}+\frac{(bc)\int\frac{1}{x^2\left(1+c^2x^2\right)}\,dx}{2d^2}-\frac{(ibe)\int\frac{\log(1-}{x}}{d^3}$$

$$=-\frac{bc}{2d^2x}-\frac{a+b\tan^{-1}(cx)}{2d^2x^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)}-\frac{2ae\log(x)}{d^3}-\frac{ibe\text{Li}_2(-icx)}{d^3}+\frac{ibe\text{Li}_2(icx)}{d^3}$$

$$=-\frac{bc}{2d^2x}-\frac{bc^2\tan^{-1}(cx)}{2d^2}+\frac{bc^2e\tan^{-1}(cx)}{2d^2\left(c^2d-e\right)}-\frac{a+b\tan^{-1}(cx)}{2d^2x^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)}-\frac{bce^{3/2}}{2d^5}$$

$$=-\frac{bc}{2d^2x}-\frac{bc^2\tan^{-1}(cx)}{2d^2}+\frac{bc^2e\tan^{-1}(cx)}{2d^2\left(c^2d-e\right)}-\frac{a+b\tan^{-1}(cx)}{2d^2x^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)}-\frac{bce^{3/2}}{2d^5}$$

$$=-\frac{bc}{2d^2x}-\frac{bc^2\tan^{-1}(cx)}{2d^2}+\frac{bc^2e\tan^{-1}(cx)}{2d^2\left(c^2d-e\right)}-\frac{a+b\tan^{-1}(cx)}{2d^2x^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)}-\frac{bce^{3/2}}{2d^5}$$

Mathematica [A] time = 13.70, size = 643, normalized size = 1.31

$$-\frac{a\left(d\left(\frac{e}{d+ex^2}+\frac{1}{x^2}\right)-2e\log\left(d+ex^2\right)+4e\log(x)\right)+b\left(\frac{c\sqrt{d}e^{3/2}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{c^2d-e}+\frac{c^2d\left(c^2d-2e\right)\tan^{-1}(cx)}{c^2d-e}-e\left(-i\text{Li}_2\left(\frac{c\left(\sqrt{d}-i\sqrt{e}x\right.}{c\sqrt{d}-\sqrt{e}}\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -1/2*(a*(d*(x^(-2) + e/(d + e*x^2)) + 4*e*Log[x] - 2*e*Log[d + e*x^2]) + b*
((c*d)/x + (c^2*d*(c^2*d - 2*e)*ArcTan[c*x])/(c^2*d - e) + d*(x^(-2) + e/(d
 + e*x^2))*ArcTan[c*x] + (c*Sqrt[d]*e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(c
^2*d - e) + 4*e*ArcTan[c*x]*Log[x] - 2*e*ArcTan[c*x]*Log[d + e*x^2] - (2*I)
*e*(Log[x]*(Log[1 - I*c*x] - Log[1 + I*c*x]) - PolyLog[2, (-I)*c*x] + PolyL
```

```
og[2, I*c*x]) - e*(2*ArcTan[c*x]*Log[((-I)*Sqrt[d])/Sqrt[e] + x] + 2*ArcTan
[c*x]*Log[(I*Sqrt[d])/Sqrt[e] + x] + I*Log[((-I)*Sqrt[d])/Sqrt[e] + x]*Log[
(Sqrt[e]*(-1 - I*c*x))/(c*Sqrt[d] - Sqrt[e])] - I*Log[((-I)*Sqrt[d])/Sqrt[e
] + x]*Log[(Sqrt[e]*(1 - I*c*x))/(c*Sqrt[d] + Sqrt[e])] - I*Log[(I*Sqrt[d])
/Sqrt[e] + x]*Log[(Sqrt[e]*(-1 + I*c*x))/(c*Sqrt[d] - Sqrt[e])] + I*Log[(I*
Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1 + I*c*x))/(c*Sqrt[d] + Sqrt[e])] - 2*
ArcTan[c*x]*Log[d + e*x^2] - I*PolyLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sq
rt[d] - Sqrt[e])] + I*PolyLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sqrt[d] + S
qrt[e])] + I*PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])]
- I*PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x))/(c*Sqrt[d] + Sqrt[e])])))/d^3
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{e^2x^7+2\,dex^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^2*x^7 + 2*d*e*x^5 + d^2*x^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.37, size = 925, normalized size = 1.89

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^2,x)
```

```
[Out] -1/2*c^4*b/d/(c^2*d-e)*arctan(c*x)+b*arctan(c*x)*e/d^3*ln(c^2*e*x^2+c^2*d)-
2*b*arctan(c*x)/d^3*e*ln(c*x)+I*b/d^3*e*dilog(1-I*c*x)+1/2*I*b/d^3*e*dilog(
(RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*
d-e,index=2))+1/2*I*b/d^3*e*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-
c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1/2*I*b/d^3*e*dilog((RootOf
(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,ind
ex=2))-I*b/d^3*e*dilog(1+I*c*x)-1/2*I*b/d^3*e*dilog((RootOf(e*_Z^2+2*I*_Z*e
+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))-1/2*a/d^2
/x^2-I*b/d^3*e*ln(c*x)*ln(1+I*c*x)-1/2*I*b/d^3*e*ln(c*x-I)*ln((RootOf(e*_Z^
2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))
-1/2*I*b/d^3*e*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)
/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))-1/2*I*b/d^3*e*ln(I+c*x)*ln(c^2*e*
x^2+c^2*d)-1/2*c^2*b*arctan(c*x)*e/d^2/(c^2*e*x^2+c^2*d)+1/2*I*b/d^3*e*ln(c
*x-I)*ln(c^2*e*x^2+c^2*d)+1/2*I*b/d^3*e*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*
e+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+I*b/d^3*
e*ln(c*x)*ln(1-I*c*x)+1/2*I*b/d^3*e*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^
2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))-1/2*c*b/d^2*
e^2/(c^2*d-e)/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+b*c^2*e*arctan(c*x)/d^2/(
c^2*d-e)-1/2*c^2*a*e/d^2/(c^2*e*x^2+c^2*d)+a*e/d^3*ln(c^2*e*x^2+c^2*d)-2*a/
d^3*e*ln(c*x)-1/2*b*c/d^2/x-1/2*b*arctan(c*x)/d^2/x^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{2\,ex^2+d}{d^2ex^4+d^3x^2}-\frac{2\,e\log\left(ex^2+d\right)}{d^3}+\frac{4\,e\log(x)}{d^3}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(e^2x^7+2\,dex^5+d^2x^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((2*e*x^2 + d)/(d^2*e*x^4 + d^3*x^2) - 2*e*log(e*x^2 + d)/d^3 + 4*e*
log(x)/d^3) + 2*b*integrate(1/2*arctan(c*x)/(e^2*x^7 + 2*d*e*x^5 + d^2*x^3)
, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^3\,{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1162 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=1335

$$-\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\tan^{-1}(cx)\right)}{2\sqrt{d}e^{3/2}}-\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(ex^2+d\right)}+\frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}e^{3/2}}-\frac{ib\log(icx+1)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4\sqrt{-d}e^{3/2}}+ib\log$$

```
[Out] -1/2*x*(a+b*arctan(c*x))/e/(e*x^2+d)+1/4*b*c*ln(c^2*x^2+1)/(c^2*d-e)/e-1/4*
b*c*ln(e*x^2+d)/(c^2*d-e)/e-1/8*I*b*c*ln((1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^
2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))/e^(3/2)/(-c^2)^(1/2)/d
^(1/2)-1/4*I*b*polylog(2,(1-I*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+e^(1/2)))/e^(3/2
)/(-d)^(1/2)+1/8*I*b*c*ln(-(1-x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/
2)-e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))/e^(3/2)/(-c^2)^(1/2)/d^(1/2)+1/4*I*b
*polylog(2,(I+c*x)*e^(1/2)/(c*(-d)^(1/2)+I*e^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4
*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2))/(c*(-d)^(1/2)-I*e^(1/2)))/e^(3
/2)/(-d)^(1/2)-1/8*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^
2)^(1/2)*d^(1/2)-I*e^(1/2)))/e^(3/2)/(-c^2)^(1/2)/d^(1/2)-1/4*I*b*ln(1-I*c*
x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)-I*e^(1/2)))/e^(3/2)/(-d)^(1/2)
+1/8*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/
2)+I*e^(1/2)))/e^(3/2)/(-c^2)^(1/2)/d^(1/2)+a*arctan(x*e^(1/2)/d^(1/2))/e^(
3/2)/d^(1/2)-1/2*(a+b*arctan(c*x))*arctan(x*e^(1/2)/d^(1/2))/e^(3/2)/d^(1/2
)+1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))
/e^(3/2)/(-d)^(1/2)+1/8*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/
((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))/e^(3/2)/(-c^2)^(1/2)/d^(1/2)-1/8*I*b*c*po
lylog(2,(-c^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)-I*e^(1/2))
)/e^(3/2)/(-c^2)^(1/2)/d^(1/2)+1/4*I*b*polylog(2,(I-c*x)*e^(1/2)/(c*(-d)^(1
/2)+I*e^(1/2)))/e^(3/2)/(-d)^(1/2)-1/8*I*b*c*ln((1-x*(-c^2)^(1/2))*e^(1/2)/
(I*(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))/e^(3/2)/(-c^2)^
(1/2)/d^(1/2)-1/4*I*b*polylog(2,(1+I*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+e^(1/2)))
/e^(3/2)/(-d)^(1/2)+1/8*I*b*c*ln(-(1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2
)*d^(1/2)-e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))/e^(3/2)/(-c^2)^(1/2)/d^(1/2)+
1/4*I*b*ln(1-I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))/e
^(3/2)/(-d)^(1/2)
```

Rubi [A] time = 1.96, antiderivative size = 1335, normalized size of antiderivative = 1.00, number of steps used = 45, number of rules used = 14, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4980, 199, 205, 4912, 6725, 444, 36, 31, 4908, 2409, 2394, 2393, 2391, 4910}

$$-\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\tan^{-1}(cx)\right)}{2\sqrt{d}e^{3/2}}-\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(ex^2+d\right)}+\frac{a\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}e^{3/2}}-\frac{ib\log(icx+1)\log\left(\frac{c\left(\sqrt{-d}-\sqrt{e}x\right)}{c\sqrt{-d}-i\sqrt{e}}\right)}{4\sqrt{-d}e^{3/2}}+ib\log$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -(x*(a + b*ArcTan[c*x]))/(2*e*(d + e*x^2)) + (a*ArcTan[(Sqrt[e]*x)/Sqrt[d]]
)/(Sqrt[d]*e^(3/2)) - ((a + b*ArcTan[c*x])*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*
Sqrt[d]*e^(3/2)) - ((I/4)*b*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(
c*Sqrt[-d] - I*Sqrt[e])])/(Sqrt[-d]*e^(3/2)) + ((I/4)*b*Log[1 - I*c*x]*Log[
(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(Sqrt[-d]*e^(3/2)) -
((I/4)*b*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt
[e])])/(Sqrt[-d]*e^(3/2)) + ((I/4)*b*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] + Sqrt
[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(Sqrt[-d]*e^(3/2)) - ((I/8)*b*c*Log[(Sqr
```

```
t[e]*(1 - Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 - (I*Sqrt[
e]*x)/Sqrt[d]])/(Sqrt[-c^2]*Sqrt[d]*e^(3/2)) + ((I/8)*b*c*Log[-((Sqrt[e]*(1
 + Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 - (I*Sqrt[e]*x)/
Sqrt[d]])/(Sqrt[-c^2]*Sqrt[d]*e^(3/2)) + ((I/8)*b*c*Log[-((Sqrt[e]*(1 - Sqr
t[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d
]])/(Sqrt[-c^2]*Sqrt[d]*e^(3/2)) - ((I/8)*b*c*Log[(Sqrt[e]*(1 + Sqrt[-c^2]*
x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt
[-c^2]*Sqrt[d]*e^(3/2)) + (b*c*Log[1 + c^2*x^2])/(4*(c^2*d - e)*e) - (b*c*L
og[d + e*x^2])/(4*(c^2*d - e)*e) + ((I/4)*b*PolyLog[2, (Sqrt[e]*(I - c*x))/
(c*Sqrt[-d] + I*Sqrt[e])]])/(Sqrt[-d]*e^(3/2)) - ((I/4)*b*PolyLog[2, (Sqrt[e
]*(1 - I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])]])/(Sqrt[-d]*e^(3/2)) - ((I/4)*b*Pol
yLog[2, (Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])]])/(Sqrt[-d]*e^(3/2))
 + ((I/4)*b*PolyLog[2, (Sqrt[e]*(I + c*x))/(c*Sqrt[-d] + I*Sqrt[e])]])/(Sqrt
[-d]*e^(3/2)) - ((I/8)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x))/
(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])]])/(Sqrt[-c^2]*Sqrt[d]*e^(3/2)) + ((I/8)*b*
c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] + I*S
qrt[e])]])/(Sqrt[-c^2]*Sqrt[d]*e^(3/2)) - ((I/8)*b*c*PolyLog[2, (Sqrt[-c^2]*
(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])]])/(Sqrt[-c^2]*Sqr
t[d]*e^(3/2)) + ((I/8)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] + I*Sqrt[e]*x))/
(Sqrt[-c^2]*Sqrt[d] + I*Sqrt[e])]])/(Sqrt[-c^2]*Sqrt[d]*e^(3/2))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
```

```
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx = \int\left(-\frac{d\left(a+b\tan^{-1}(cx)\right)}{e\left(d+ex^2\right)^2}+\frac{a+b\tan^{-1}(cx)}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{d+ex^2}\,dx}{e} - \frac{d\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx}{e}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} + \frac{a\int \frac{1}{d+ex^2}\,dx}{e} + \frac{b\int \frac{\tan^{-1}(cx)}{d+ex^2}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} + \frac{(ib)\int \frac{\log(1}{d+}}{2e}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} + \frac{(bc)\int \frac{\tan^{-}}{1+}}{2\sqrt{d}}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} + \frac{(ibc)\int \frac{\log(}{1}}{4\sqrt{d}}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} - \frac{ib\log(1+}{}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} - \frac{ib\log(1+}{}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} - \frac{ib\log(1+}{}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} - \frac{ib\log(1+}{}$$

$$= -\frac{x\left(a+b\tan^{-1}(cx)\right)}{2e\left(d+ex^2\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{\sqrt{d}\,e^{3/2}} - \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}} - \frac{ib\log(1+}{}$$

Mathematica [A] time = 10.54, size = 877, normalized size = 0.66

$$-\frac{ax}{2e\left(ex^2+d\right)}+\frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2\sqrt{d}\,e^{3/2}}+\frac{bc\left(-\frac{2\log\left(\frac{dc^2+e+\left(c^2d-e\right)\cos\left(2\tan^{-1}(cx)\right)}{dc^2+e}\right)}{c^2d-e}+\frac{-4\tan^{-1}(cx)\tanh^{-1}\left(\frac{\sqrt{-c^2de}}{cex}\right)+2\cos^{-1}\left(\frac{dc^2+e}{e-c^2d}\right)\tanh^{-1}\left(\frac{}{\sqrt{}}\right.}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] -1/2*(a*x)/(e*(d + e*x^2)) + (a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*Sqrt[d]*e^(
3/2)) + (b*c*((-2*Log[(c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]])/(c^2*d +
 e)])/(c^2*d - e) + (-4*ArcTan[c*x]*ArcTanh[Sqrt[-(c^2*d*e)]/(c*e*x)] + 2*A
rcCos[(c^2*d + e)/(-(c^2*d) + e)]*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]] + (ArcC
os[(c^2*d + e)/(-(c^2*d) + e)] - (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*L
og[(-2*c^2*d*(I*e + Sqrt[-(c^2*d*e)])*(-I + c*x))/((c^2*d - e)*(c^2*d - c*S
qrt[-(c^2*d*e)]*x))] + (ArcCos[(c^2*d + e)/(-(c^2*d) + e)] + (2*I)*ArcTanh[
(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[((2*I)*c^2*d*(e + I*Sqrt[-(c^2*d*e)])*(I + c
*x))/((c^2*d - e)*(c^2*d - c*Sqrt[-(c^2*d*e)]*x))] - (ArcCos[(c^2*d + e)/(-
(c^2*d) + e)] - (2*I)*ArcTanh[Sqrt[-(c^2*d*e)]/(c*e*x)] + (2*I)*ArcTanh[(c*
e*x)/Sqrt[-(c^2*d*e)]])*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sqrt[-(c^2*d) + e]*
E^(I*ArcTan[c*x])*Sqrt[-(c^2*d) - e + (-(c^2*d) + e)*Cos[2*ArcTan[c*x]]])]
- (ArcCos[(c^2*d + e)/(-(c^2*d) + e)] + (2*I)*ArcTanh[Sqrt[-(c^2*d*e)]/(c*e
*x)] - (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(Sqrt[2]*Sqrt[-(c^2*d*e
)]*E^(I*ArcTan[c*x]))/(Sqrt[-(c^2*d) + e]*Sqrt[-(c^2*d) - e + (-(c^2*d) + e
)*Cos[2*ArcTan[c*x]]])] + I*(PolyLog[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)
])*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(c^2*d - c*Sqrt[-(c^2*d*e)]
*x))] - PolyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(c^2*d + c*Sqrt[-(
c^2*d*e)]*x))/((c^2*d - e)*(c^2*d - c*Sqrt[-(c^2*d*e)]*x))]))/Sqrt[-(c^2*d*
e)] - (4*ArcTan[c*x]*Sin[2*ArcTan[c*x]])/(c^2*d + e + (c^2*d - e)*Cos[2*Arc
Tan[c*x]])))/(8*e)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\arctan(cx)+ax^2}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arctan(c*x) + a*x^2)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 2.37, size = 2315, normalized size = 1.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^2,x)
```

```
[Out] -1/4*I/c*b*(c^2*e*d)^(1/2)/(c^2*d-e)/d/e*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*
x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))-1/2*c^2*a/e*x/(c^2*e*x^2+c^2
*d)-1/4*b*(d*e)^(1/2)/d*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*
c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+3/4*I*c^3*b*ln(1-(c^2*d-e)*(1+I*c*x)^
2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)*d/(c^2*d-e)/e/(c^4*
d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)-1/4*I*c^5*b*d^2*ln(1-(c^2*d-e)*(1+I*c*x)
^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^2*d-e)/e^2/(c^4
*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1/4*I/c*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c
^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^2*d-e)/d/(c^4*d^2-2*
c^2*d*e+e^2)*(c^2*e*d)^(1/2)*e-1/2*c^4*b*arctan(c*x)/(c^2*d-e)/e/(c^2*e*x^2
+c^2*d)*x*d-1/4*c^5*b*d^2*arctan(c*x)^2/(c^2*d-e)/e^2/(c^4*d^2-2*c^2*d*e+e^
2)*(c^2*e*d)^(1/2)-1/8*c^5*b*d^2*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1
)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/(c^2*d-e)/e^2/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*
e*d)^(1/2)+3/8*c^3*b*d*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+
2*(c^2*e*d)^(1/2)-e))/(c^2*d-e)/e/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1
/8/c*b*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2
)-e))/(c^2*d-e)/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*e+3/4*c^3*b*d*arc
tan(c*x)^2/(c^2*d-e)/e/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1/4/c*b*arct
an(c*x)^2/(c^2*d-e)/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*e-1/2*I*c^3*b
*arctan(c*x)/(c^2*d-e)/e/(c^2*e*x^2+c^2*d)*d+1/4*I*c*b*(c^2*e*d)^(1/2)/(c^2
*d-e)/e^2*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2
*e*d)^(1/2)-e))-3/4*I*c*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*
(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)
^(1/2)-1/4*c^3*b/(c^2*d-e)^2/e*d*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d
*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c
^2*x^2+1)*e-e)-1/4*b*(d*e)^(1/2)/d/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(
c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)-3/8*c*b*polylog(2,(c^2*d-e
)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/(c^2*d-e)/(c^4*d^2-
2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+c^3*b/(c^2*d-e)^2/e*d*ln((1+I*c*x)/(c^2*x^2+
1)^(1/2))+1/2*c^2*b*arctan(c*x)/(c^2*d-e)/(c^2*e*x^2+c^2*d)*x+1/8*c*b*(c^2*
e*d)^(1/2)/(c^2*d-e)/e^2*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*
d-2*(c^2*e*d)^(1/2)-e))+1/4*c*b*(c^2*e*d)^(1/2)/(c^2*d-e)/e^2*arctan(c*x)^2
-1/4*c^2*b*(d*e)^(1/2)/e^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)
+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)-3/4*c*b*arctan(c*x)^2/(c^4*d^2-2*c^2
*d*e+e^2)/(c^2*d-e)*(c^2*e*d)^(1/2)-1/8/c*b*(c^2*e*d)^(1/2)/(c^2*d-e)/d/e*p
olylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))-1/
4/c*b*(c^2*e*d)^(1/2)/(c^2*d-e)/d/e*arctan(c*x)^2+1/4*c^4*b*(d*e)^(1/2)*d/e
^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1
/2))/(c^2*d-e)^2-1/2*I*c^3*b*arctan(c*x)/(c^2*d-e)/(c^2*e*x^2+c^2*d)*x^2+1/
2*a/e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-c*b/(c^2*d-e)^2*ln((1+I*c*x)/(c^2
*x^2+1)^(1/2))+1/4*c*b/(c^2*d-e)^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2
*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/
(c^2*x^2+1)*e-e)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{x}{e^2x^2+de}-\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,e}\right)+2\,b\int\frac{x^2\arctan\left(cx\right)}{2\left(e^2x^4+2\,dex^2+d^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*(x/(e^2*x^2 + d*e) - arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e)) + 2*b*inte
grate(1/2*x^2*arctan(c*x)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^2,x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^2, x)
```

sympy **[F(-1)]** time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1163 $\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=819

$$\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\tan^{-1}(cx)\right)}{2d^{3/2}\sqrt{e}}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(ex^2+d\right)}+\frac{ibc\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}x\right)}{i\sqrt{-c^2}\sqrt{d}+\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{8\sqrt{-c^2}d^{3/2}\sqrt{e}}-\frac{ibc\log\left(-\frac{\sqrt{e}\left(\sqrt{-c^2}x+1\right)}{i\sqrt{-c^2}\sqrt{d}-\sqrt{e}}\right)}{8\sqrt{-c^2}d^{3/2}}$$

```
[Out] 1/2*x*(a+b*arctan(c*x))/d/(e*x^2+d)-1/4*b*c*ln(c^2*x^2+1)/d/(c^2*d-e)+1/4*b
*c*ln(e*x^2+d)/d/(c^2*d-e)+1/2*(a+b*arctan(c*x))*arctan(x*e^(1/2)/d^(1/2))/
d^(3/2)/e^(1/2)-1/8*I*b*c*ln(-(1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^
(1/2)-e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))/d^(3/2)/(-c^2)^(1/2)/e^(1/2)+1/8*
I*b*c*ln((1-x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1-
I*x*e^(1/2)/d^(1/2))/d^(3/2)/(-c^2)^(1/2)/e^(1/2)-1/8*I*b*c*ln(-(1-x*(-c^2)
^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)-e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))
/d^(3/2)/(-c^2)^(1/2)/e^(1/2)+1/8*I*b*c*ln((1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-
c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))/d^(3/2)/(-c^2)^(1/2)
/e^(1/2)+1/8*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/
2)*d^(1/2)-I*e^(1/2)))/d^(3/2)/(-c^2)^(1/2)/e^(1/2)-1/8*I*b*c*polylog(2,(-c
^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))/d^(3/2)/(
-c^2)^(1/2)/e^(1/2)+1/8*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/
((-c^2)^(1/2)*d^(1/2)-I*e^(1/2)))/d^(3/2)/(-c^2)^(1/2)/e^(1/2)-1/8*I*b*c*po
lylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2))
)/d^(3/2)/(-c^2)^(1/2)/e^(1/2)
```

Rubi [A] time = 0.89, antiderivative size = 819, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 12, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {199, 205, 4912, 6725, 444, 36, 31, 4908, 2409, 2394, 2393, 2391}

$$\frac{\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\tan^{-1}(cx)\right)}{2d^{3/2}\sqrt{e}}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(ex^2+d\right)}+\frac{ibc\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}x\right)}{i\sqrt{-c^2}\sqrt{d}+\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}x}{\sqrt{d}}\right)}{8\sqrt{-c^2}d^{3/2}\sqrt{e}}-\frac{ibc\log\left(-\frac{\sqrt{e}\left(\sqrt{-c^2}x+1\right)}{i\sqrt{-c^2}\sqrt{d}-\sqrt{e}}\right)}{8\sqrt{-c^2}d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + e*x^2)^2,x]
```

```
[Out] (x*(a + b*ArcTan[c*x]))/(2*d*(d + e*x^2)) + ((a + b*ArcTan[c*x])*ArcTan[(Sq
rt[e]*x)/Sqrt[d]])/(2*d^(3/2)*Sqrt[e]) + ((I/8)*b*c*Log[(Sqrt[e]*(1 - Sqrt[
-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]])
/(Sqrt[-c^2]*d^(3/2)*Sqrt[e]) - ((I/8)*b*c*Log[-((Sqrt[e]*(1 + Sqrt[-c^2]*x
))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt
[-c^2]*d^(3/2)*Sqrt[e]) - ((I/8)*b*c*Log[-((Sqrt[e]*(1 - Sqrt[-c^2]*x))/(I*
Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]
*d^(3/2)*Sqrt[e]) + ((I/8)*b*c*Log[(Sqrt[e]*(1 + Sqrt[-c^2]*x))/(I*Sqrt[-c^
2]*Sqrt[d] + Sqrt[e])]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(3/2)*
Sqrt[e]) - (b*c*Log[1 + c^2*x^2])/(4*d*(c^2*d - e)) + (b*c*Log[d + e*x^2])/
(4*d*(c^2*d - e)) + ((I/8)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*
x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])])/(Sqrt[-c^2]*d^(3/2)*Sqrt[e]) - ((I/8
)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] +
 I*Sqrt[e])])/(Sqrt[-c^2]*d^(3/2)*Sqrt[e]) + ((I/8)*b*c*PolyLog[2, (Sqrt[-c
^2]*(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])])/(Sqrt[-c^2]
*d^(3/2)*Sqrt[e]) - ((I/8)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] + I*Sqrt[e]*
x))/(Sqrt[-c^2]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2]*d^(3/2)*Sqrt[e])
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
```

```
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx = \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} - (bc)\int \frac{\frac{x}{2d\left(d+ex^2\right)} + \frac{\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}}}{1+c^2x^2}\,d$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} - (bc)\int\left(\frac{x}{2d\left(1+c^2x^2\right)\left(d+ex^2\right)}\right.$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} - \frac{(bc)\int \frac{x}{\left(1+c^2x^2\right)\left(d+ex^2\right)}\,dx}{2d} - \frac{(bc)}{}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} - \frac{(bc)\,\text{Subst}\left(\int \frac{1}{\left(1+c^2x\right)(d+ex)}\,dx, x\right.}{4d}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} - \frac{\left(bc^3\right)\text{Subst}\left(\int \frac{1}{1+c^2x}\,dx, x, x^2\right)}{4d\left(c^2d-e\right)}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} - \frac{bc\log\left(1+c^2x^2\right)}{4d\left(c^2d-e\right)} + \frac{bc\log\left(d+\right.}{4d\left(c^2d-\right.}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{ibc\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\sqrt{d}+\sqrt{e}}\right)\log\left(1-\right.}{8\sqrt{-c^2}\,d^{3/2}\sqrt{e}}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{ibc\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\sqrt{d}+\sqrt{e}}\right)\log\left(1-\right.}{8\sqrt{-c^2}\,d^{3/2}\sqrt{e}}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{2d\left(d+ex^2\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{ibc\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\sqrt{d}+\sqrt{e}}\right)\log\left(1-\right.}{8\sqrt{-c^2}\,d^{3/2}\sqrt{e}}$$

Mathematica [A] time = 10.51, size = 861, normalized size = 1.05

$$\frac{ax}{2d\left(ex^2+d\right)} + \frac{a\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{2d^{3/2}\sqrt{e}} + \frac{bc\left(\frac{2\log\left(\frac{\left(c^2d-e\right)\cos\left(2\tan^{-1}(cx)\right)}{dc^2+e}+1\right)}{c^2d-e} + \frac{-4\tan^{-1}(cx)\tanh^{-1}\left(\frac{\sqrt{-c^2de}}{cex}\right)+2\cos^{-1}\left(-\frac{dc^2+e}{c^2d-e}\right)\tanh^{-1}\left(\frac{cex}{\sqrt{-c^2de}}\right.}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + e*x^2)^2,x]
```

```
[Out] (a*x)/(2*d*(d + e*x^2)) + (a*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(3/2)*Sqrt[e
]) + (b*c*((2*Log[1 + ((c^2*d - e)*Cos[2*ArcTan[c*x]])/(c^2*d + e)])/(c^2*d
```

```
 - e) + (-4*ArcTan[c*x]*ArcTanh[Sqrt[-(c^2*d*e)]/(c*e*x)] + 2*ArcCos[-((c^2
*d + e)/(c^2*d - e))]*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]] - (ArcCos[-((c^2*d
+ e)/(c^2*d - e))] + (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(2*c^2*d*
((-I)*e + Sqrt[-(c^2*d*e)])*(-I + c*x))/((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*
d*e)]*x))] - (ArcCos[-((c^2*d + e)/(c^2*d - e))] - (2*I)*ArcTanh[(c*e*x)/Sq
rt[-(c^2*d*e)]])*Log[(2*c^2*d*(I*e + Sqrt[-(c^2*d*e)])*(I + c*x))/((c^2*d -
 e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] + (ArcCos[-((c^2*d + e)/(c^2*d - e))]
- (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d
*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sqrt[c^2*d - e]*E^(I*ArcTan[c*x])*S
qrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] + (ArcCos[-((c^2*d + e)/(
c^2*d - e))] + (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)
/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)]*E^(I*ArcTan[c*x]))/(Sqrt
[c^2*d - e]*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] + I*(PolyLog
[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(c^2*d - c*Sqrt[-(c^2*d*e)]*x))/(
(c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] - PolyLog[2, ((c^2*d + e + (2*
I)*Sqrt[-(c^2*d*e)])*(c^2*d - c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(c^2*d +
c*Sqrt[-(c^2*d*e)]*x))]))/Sqrt[-(c^2*d*e)] + (4*ArcTan[c*x]*Sin[2*ArcTan[c*
x]])/(c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]])))/(8*d)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b \arctan(cx) + a}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 2.02, size = 2315, normalized size = 2.83

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(e*x^2+d)^2,x)
```

```
[Out] 1/4*I*c*b*(c^2*e*d)^(1/2)/(c^2*d-e)/d/e*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x
)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+1/2*I*c^3*b*arctan(c*x)/d/(c^
2*d-e)/(c^2*e*x^2+c^2*d)*x^2*e-1/4*I*c^5*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*
x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^2*d-e)/e/(c^4*d^2-2*c^2
*d*e+e^2)*(c^2*e*d)^(1/2)*d+1/2*c^2*a*x/d/(c^2*e*x^2+c^2*d)-3/4*I*c*b*e*ln(
1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*
x)/d/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1/4*I/c*b*e^2*ln(1-(
c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/
d^2/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1/4*c^2*b*(d*e)^(1/2)
/d/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^
(1/2))/(c^2*d-e)+1/4*c*b*(c^2*e*d)^(1/2)/(c^2*d-e)/d/e*arctan(c*x)^2+1/8*c*
b*(c^2*e*d)^(1/2)/(c^2*d-e)/d/e*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)
/(-c^2*d-2*(c^2*e*d)^(1/2)-e))-3/4*c*b*arctan(c*x)^2/(c^2*d-e)/d/(c^4*d^2-2
*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*e-1/8*c^5*b*d*polylog(2,(c^2*d-e)*(1+I*c*x)^2
```

```
/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/(c^2*d-e)/e/(c^4*d^2-2*c^2*d*e+e
^2)*(c^2*e*d)^(1/2)-3/8*c*b*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c
^2*d+2*(c^2*e*d)^(1/2)-e))/(c^2*d-e)/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1
/2)*e-1/4*c^5*b*d*arctan(c*x)^2/(c^2*d-e)/e/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*
d)^(1/2)-1/2*c^2*b*arctan(c*x)/d/(c^2*d-e)/(c^2*e*x^2+c^2*d)*x*e+1/8/c*b*e^
2*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))
/d^2/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1/4/c*b*e^2*arctan(c
*x)^2/d^2/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+3/4*I*c^3*b*arc
tan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e
))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)*(c^2*e*d)^(1/2)-1/4*I/c*b*(c^2*e*d)^(1
/2)/d^2/(c^2*d-e)*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*
d-2*(c^2*e*d)^(1/2)-e))+1/2*a/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/4*c^4
*b*(d*e)^(1/2)/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2
*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+c*b/d/(c^2*d-e)^2*e*ln((1+I*c*x)/(c^2*x^2+1)
^(1/2))-1/4*c*b/d/(c^2*d-e)^2*e*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*
(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^
2*x^2+1)*e-e)+3/4*c^3*b*arctan(c*x)^2/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)*(c^
2*e*d)^(1/2)+3/8*c^3*b*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+
2*(c^2*e*d)^(1/2)-e))/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1/2
*c^4*b*arctan(c*x)/(c^2*d-e)/(c^2*e*x^2+c^2*d)*x-1/8/c*b*(c^2*e*d)^(1/2)/d^
2/(c^2*d-e)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)
^(1/2)-e))-1/4/c*b*(c^2*e*d)^(1/2)/d^2/(c^2*d-e)*arctan(c*x)^2+1/4*b*(d*e)^
(1/2)/d^2*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c
/(d*e)^(1/2))/(c^2*d-e)^2+1/2*I*c^3*b*arctan(c*x)/(c^2*d-e)/(c^2*e*x^2+c^2*
d)+1/4*b*(d*e)^(1/2)/d^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2
*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)-c^3*b/(c^2*d-e)^2*ln((1+I*c*x)/(c^2*x^
2+1)^(1/2))+1/4*c^3*b/(c^2*d-e)^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*
d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(
c^2*x^2+1)*e-e)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{x}{dex^2+d^2}+\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(e^2x^4+2\,dex^2+d^2\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a*(x/(d*e*x^2 + d^2) + arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d)) + 2*b*integ
rate(1/2*arctan(c*x)/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{{\left(e\,x^2+d\right)}^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + e*x^2)^2,x)
```

```
[Out] int((a + b*atan(c*x))/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1164 $\int \frac{a+b\tan^{-1}(cx)}{x^2(d+ex^2)^2}\,dx$

Optimal. Leaf size=1382

$$-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\tan^{-1}(cx)\right)}{2d^{5/2}}-\frac{a+b\tan^{-1}(cx)}{d^2x}-\frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(ex^2+d\right)}-\frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}}+\frac{bc\log(x)}{d^2}+\frac{ib\sqrt{e}\,\mathrm{l}}{}$$

```
[Out] (-a-b*arctan(c*x))/d^2/x-1/2*e*x*(a+b*arctan(c*x))/d^2/(e*x^2+d)+b*c*ln(x)/
d^2-1/2*b*c*ln(c^2*x^2+1)/d^2+1/4*b*c*e*ln(c^2*x^2+1)/d^2/(c^2*d-e)-1/4*b*c
*e*ln(e*x^2+d)/d^2/(c^2*d-e)-a*arctan(x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)-1/
2*(a+b*arctan(c*x))*arctan(x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)+1/8*I*b*c*pol
ylog(2,(-c^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))
*e^(1/2)/d^(5/2)/(-c^2)^(1/2)+1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2
))/(c*(-d)^(1/2)-I*e^(1/2)))*e^(1/2)/(-d)^(5/2)-1/8*I*b*c*polylog(2,(-c^2)^
(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)-I*e^(1/2)))*e^(1/2)/d^(5/
2)/(-c^2)^(1/2)+1/4*I*b*ln(1-I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/
2)-I*e^(1/2)))*e^(1/2)/(-d)^(5/2)-1/8*I*b*c*ln((1-x*(-c^2)^(1/2))*e^(1/2)/(
I*(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)/
(-c^2)^(1/2)+1/8*I*b*c*ln(-(1-x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/
2)-e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)/(-c^2)^(1/2)-1/8*I*b
*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)-I*e^(
1/2)))*e^(1/2)/d^(5/2)/(-c^2)^(1/2)+1/4*I*b*polylog(2,(1+I*c*x)*e^(1/2)/(I*
c*(-d)^(1/2)+e^(1/2)))*e^(1/2)/(-d)^(5/2)-1/8*I*b*c*ln((1+x*(-c^2)^(1/2))*e
^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))*e^(1/2)/
d^(5/2)/(-c^2)^(1/2)+1/4*I*b*polylog(2,(1-I*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+e^
(1/2)))*e^(1/2)/(-d)^(5/2)-1/4*I*b*polylog(2,(I-c*x)*e^(1/2)/(c*(-d)^(1/2)+
I*e^(1/2)))*e^(1/2)/(-d)^(5/2)-1/4*I*b*polylog(2,(I+c*x)*e^(1/2)/(c*(-d)^(1
/2)+I*e^(1/2)))*e^(1/2)/(-d)^(5/2)-1/4*I*b*ln(1-I*c*x)*ln(c*((-d)^(1/2)-x*e
^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(5/2)+1/8*I*b*c*polylog(2,(-
c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))*e^(1/2)/
d^(5/2)/(-c^2)^(1/2)+1/8*I*b*c*ln(-(1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/
2)*d^(1/2)-e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)/(-c^2)^(1/2)
-1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))*
e^(1/2)/(-d)^(5/2)
```

Rubi [A] time = 1.58, antiderivative size = 1382, normalized size of antiderivative = 1.00, number of steps used = 50, number of rules used = 17, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.810, Rules used = {4980, 4852, 266, 36, 29, 31, 199, 205, 4912, 6725, 444, 4908, 2409, 2394, 2393, 2391, 4910}

$$-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)\left(a+b\tan^{-1}(cx)\right)}{2d^{5/2}}-\frac{a+b\tan^{-1}(cx)}{d^2x}-\frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(ex^2+d\right)}-\frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}}+\frac{bc\log(x)}{d^2}+\frac{ib\sqrt{e}\,\mathrm{l}}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] -((a + b*ArcTan[c*x])/(d^2*x)) - (e*x*(a + b*ArcTan[c*x]))/(2*d^2*(d + e*x^
2)) - (a*Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/d^(5/2) - (Sqrt[e]*(a + b*Arc
Tan[c*x])*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(5/2)) + (b*c*Log[x])/d^2 + ((I
/4)*b*Sqrt[e]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] - I
*Sqrt[e])])/(-d)^(5/2) - ((I/4)*b*Sqrt[e]*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] -
 Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(5/2) + ((I/4)*b*Sqrt[e]*Log[1
 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*Sqrt[e])])/(-d)^(5
```

```
/2) - ((I/4)*b*Sqrt[e]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqr
t[-d] + I*Sqrt[e])])/(-d)^(5/2) - ((I/8)*b*c*Sqrt[e]*Log[(Sqrt[e]*(1 - Sqrt
[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]]
)/(Sqrt[-c^2]*d^(5/2)) + ((I/8)*b*c*Sqrt[e]*Log[-((Sqrt[e]*(1 + Sqrt[-c^2]*
x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 - (I*Sqrt[e]*x)/Sqrt[d]])/(Sqr
t[-c^2]*d^(5/2)) + ((I/8)*b*c*Sqrt[e]*Log[-((Sqrt[e]*(1 - Sqrt[-c^2]*x))/(I
*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2
]*d^(5/2)) - ((I/8)*b*c*Sqrt[e]*Log[(Sqrt[e]*(1 + Sqrt[-c^2]*x))/(I*Sqrt[-c
^2]*Sqrt[d] + Sqrt[e])]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(5/2)
) - (b*c*Log[1 + c^2*x^2])/(2*d^2) + (b*c*e*Log[1 + c^2*x^2])/(4*d^2*(c^2*d
 - e)) - (b*c*e*Log[d + e*x^2])/(4*d^2*(c^2*d - e)) - ((I/4)*b*Sqrt[e]*Poly
Log[2, (Sqrt[e]*(I - c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(5/2) + ((I/4)*b
*Sqrt[e]*PolyLog[2, (Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] + Sqrt[e])])/(-d)^(
5/2) + ((I/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*(1 + I*c*x))/(I*c*Sqrt[-d] + Sq
rt[e])])/(-d)^(5/2) - ((I/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*(I + c*x))/(c*Sq
rt[-d] + I*Sqrt[e])])/(-d)^(5/2) - ((I/8)*b*c*Sqrt[e]*PolyLog[2, (Sqrt[-c^2
]*(Sqrt[d] - I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])])/(Sqrt[-c^2]*d
^(5/2)) + ((I/8)*b*c*Sqrt[e]*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x)
)/(Sqrt[-c^2]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2]*d^(5/2)) - ((I/8)*b*c*Sqrt
[e]*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I
*Sqrt[e])])/(Sqrt[-c^2]*d^(5/2)) + ((I/8)*b*c*Sqrt[e]*PolyLog[2, (Sqrt[-c^2
]*(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2]*d
^(5/2))
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2\left(d+ex^2\right)^2}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^2x^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d\left(d+ex^2\right)^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2\left(d+ex^2\right)}\right) dx$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d^2} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{d+ex^2}\,dx}{d^2} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2d^{5/2}} + (bc)\int \cdots$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{2d^2\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{5/2}} - \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\cdots}{2d^{5/2}}$$

Mathematica [A] time = 13.01, size = 992, normalized size = 0.72

$$b\left(-\frac{e\sin\left(2\tan^{-1}(cx)\right)\tan^{-1}(cx)}{2c^4d^2\left(dc^2+d\cos\left(2\tan^{-1}(cx)\right)c^2+e-e\cos\left(2\tan^{-1}(cx)\right)\right)}-\frac{\tan^{-1}(cx)}{c^5d^2x}+\frac{\log\left(\frac{cx}{\sqrt{c^2x^2+1}}\right)}{c^4d^2}-\frac{e\log\left(1-\frac{(e-}{}\right.}{4c^4d}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^2),x]
```

```
[Out] -(a/(d^2*x)) - (a*e*x)/(2*d^2*(d + e*x^2)) - (3*a*Sqrt[e]*ArcTan[(Sqrt[e]*x
)/Sqrt[d]])/(2*d^(5/2)) + b*c^5*(-(ArcTan[c*x]/(c^5*d^2*x)) + Log[(c*x)/Sqr
t[1 + c^2*x^2]]/(c^4*d^2) - (e*Log[1 - ((-(c^2*d) + e)*Cos[2*ArcTan[c*x]])/
(c^2*d + e)])/(4*c^4*d^2*(c^2*d - e)) - (3*e*(4*ArcTan[c*x]*ArcTanh[(c*d)/(
Sqrt[-(c^2*d*e)]*x)] + 2*ArcCos[(-(c^2*d) - e)/(c^2*d - e)]*ArcTanh[(c*e*x)
/Sqrt[-(c^2*d*e)]] - (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcTanh[(c
*e*x)/Sqrt[-(c^2*d*e)]])*Log[1 - ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(2*c
^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)
]*x))] + (-ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcTanh[(c*e*x)/Sqrt[
-(c^2*d*e)]])*Log[1 - ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c*
Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))] + (A
rcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*
x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(S
qrt[c^2*d - e]*E^(I*ArcTan[c*x])*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[
c*x]]])] + (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] + (2*I)*(ArcTanh[(c*d)/(Sqrt
[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(
c^2*d*e)]*E^(I*ArcTan[c*x]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d + e + (c^2*d - e)*
Cos[2*ArcTan[c*x]]])] + I*(PolyLog[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])
*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2
*d*e)]*x))] - PolyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2
*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))]))
)/(8*c^4*d^2*Sqrt[-(c^2*d*e)]) - (e*ArcTan[c*x]*Sin[2*ArcTan[c*x]])/(2*c^4*
d^2*(c^2*d + e + c^2*d*Cos[2*ArcTan[c*x]] - e*Cos[2*ArcTan[c*x]])))
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan\left(cx\right)+a}{e^2x^6+2\,dex^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^2*x^6 + 2*d*e*x^4 + d^2*x^2), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.04, size = 3851, normalized size = 2.79

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^2,x)

[Out] 3/8*b*c^7/(c^2*d-e)^3*d*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x
)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)
*e-e)+b*c^3/(c^2*d-e)/d*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+b*c^3/(c^2*d-e)/d
*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)-1/4*b*c^3/(c^2*d-e)/d*ln((1+I*c*x)^4/(c^
2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*
e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-13/16*b*c^6*(d*e)^(1/2)*arctanh(1/4*
(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^
3+b*c^2*arctan(c*x)/(c^2*d-e)/d/(c^2*e*x^2+c^2*d)/x*e-3/2*I*b*c^3*arctan(c*
x)/(c^2*d-e)/d/(c^2*e*x^2+c^2*d)*e+3/2*b*arctan(c*x)/(c^2*d-e)/d^2/(c^2*e*x
^2+c^2*d)*c^2*x*e^2-3/2*b*c^4*arctan(c*x)/d/(c^2*d-e)/(c^2*e*x^2+c^2*d)*x*e
-3/2*a/d^2*e/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))-1/2*a/d^2*e*c^2*x/(c^2*e*x
^2+c^2*d)-3/16*b/c^2*(d*e)^(1/2)/d^4*e^4*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)
^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^3-19/16*b*c^5/(c^2*d-e
)^3*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I
*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)*e-1/8*b*c^5/(c
^2*d-e)^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1
)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-2*b*c^5/
(c^2*d-e)^2*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))-1/4*b*(d*e)^(1/2)/d^3*e^3*arcta
nh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^
2*d-e)^3-9/8*b*(d*e)^(1/2)/d^3*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*
x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)-7/4*b*(d*e)^(1/2)/d^3*e^2*arct
anh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c
^2*d-e)^2+3/8*c*b/(c^2*d-e)/d^2*e*sum((_R1^2*c^2*d-_R1^2*e+3*c^2*d+e)/(_R1^
2*c^2*d-_R1^2*e+c^2*d+e)*(I*arctan(c*x)*ln((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2)
)/_R1)+dilog((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf((c^2*d-e)*_
Z^4+(2*c^2*d+2*e)*_Z^2+c^2*d-e))-c*b/(c^2*d-e)/d^2*e*ln(1+(1+I*c*x)/(c^2*x^
2+1)^(1/2))-1/16*c*b/(c^2*d-e)^3/d^2*e^3*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d
+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c
*x)^2/(c^2*x^2+1)*e-e)-3*c*b/(c^2*d-e)^2/d^2*e^2*ln((1+I*c*x)/(c^2*x^2+1)^(
1/2))-b*c^4*arctan(c*x)/(c^2*d-e)/(c^2*e*x^2+c^2*d)/x+I*b*c^5*arctan(c*x)/(
c^2*d-e)/(c^2*e*x^2+c^2*d)-3/8*c*b/(c^2*d-e)/d^2*e*sum((_R1^2*c^2*d-_R1^2*e
-c^2*d+e)/(_R1^2*c^2*d-_R1^2*e+c^2*d+e)*(I*arctan(c*x)*ln((_R1-(1+I*c*x)/(c
^2*x^2+1)^(1/2))/_R1)+dilog((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)),_R1=Roo
tOf((c^2*d-e)*_Z^4+(2*c^2*d+2*e)*_Z^2+c^2*d-e))-3/8*c*b/(c^2*d-e)^2/d^2*e^2
*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*
x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-3/16*b/c/(c^2*d-e
)^3/d^3*e^4*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2
+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+3/8*b/
c/(c^2*d-e)/d^3*e^2*sum((_R1^2*c^2*d-_R1^2*e-c^2*d+e)/(_R1^2*c^2*d-_R1^2*e+
c^2*d+e)*(I*arctan(c*x)*ln((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)+dilog((_R
1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf((c^2*d-e)*_Z^4+(2*c^2*d+2*e
)*_Z^2+c^2*d-e))+17/16*b*c^3/(c^2*d-e)^3/d*e^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2
*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*
(1+I*c*x)^2/(c^2*x^2+1)*e-e)+3/16*b/c/(c^2*d-e)^2/d^3*e^3*ln((1+I*c*x)^4/(c
^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2
*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+5/16*b*c^2*(d*e)^(1/2)/d^2*arctanh(
1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d
-e)-3/4*b*c^6*(d*e)^(1/2)/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1
)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+5*b*c^3/d/(c^2*d-e)^2*e*ln((1+I*c
*x)/(c^2*x^2+1)^(1/2))+5/16*b*c^3/d/(c^2*d-e)^2*e*ln((1+I*c*x)^4/(c^2*x^2+1
)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d
+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+1/2*b*c^4*(d*e)^(1/2)/d*arctanh(1/4*(2*(c^2
*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2-3/8*b
/c/(c^2*d-e)/d^3*e^2*sum((_R1^2*c^2*d-_R1^2*e+3*c^2*d+e)/(_R1^2*c^2*d-_R1^2
*e+c^2*d+e)*(I*arctan(c*x)*ln((_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)+dilog(
(_R1-(1+I*c*x)/(c^2*x^2+1)^(1/2))/_R1)),_R1=RootOf((c^2*d-e)*_Z^4+(2*c^2*d+
2*e)*_Z^2+c^2*d-e))+3/8*b/c/(c^2*d-e)/d^3*e^2*ln((1+I*c*x)^4/(c^2*x^2+1)^2*
c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(
```

```
1+I*c*x)^2/(c^2*x^2+1)*e-e)-c*b/(c^2*d-e)/d^2*e*ln((1+I*c*x)/(c^2*x^2+1)^(1
/2)-1)+3/16*b/c^2*(d*e)^(1/2)/d^4*e^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/
(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)+b*c^2*(d*e)^(1/2)/d^2*e^2
*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2
))/(c^2*d-e)^3-1/8*b*c^4*(d*e)^(1/2)/d*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)
^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^3+3/8*b*c^4*(d*e)^(1/2
)/d/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)
^(1/2))/(c^2*d-e)+2*b*c^2*(d*e)^(1/2)/d^2*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c
*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^2*d-e)^2+3/8*b*c^8*(d*e)^(
1/2)*d/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d
*e)^(1/2))/(c^2*d-e)^3+I*b*c^5*arctan(c*x)/(c^2*d-e)/d/(c^2*e*x^2+c^2*d)*x^
2*e-3/2*I*b*arctan(c*x)/(c^2*d-e)/d^2/(c^2*e*x^2+c^2*d)*c^3*x^2*e^2-a/d^2/x
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a\left(\frac{3\,ex^{2}+2\,d}{d^{2}ex^{3}+d^{3}x}+\frac{3\,e\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d^{2}}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(e^{2}x^{6}+2\,dex^{4}+d^{2}x^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a*((3*e*x^2 + 2*d)/(d^2*e*x^3 + d^3*x) + 3*e*arctan(e*x/sqrt(d*e))/(sq
rt(d*e)*d^2)) + 2*b*integrate(1/2*arctan(c*x)/(e^2*x^6 + 2*d*e*x^4 + d^2*x^
2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^{2}\,{\left(e\,x^{2}+d\right)}^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1165 $\int \frac{x^5(a+b\tan^{-1}(cx))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=532

$$-\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{e^3\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2e^3}+\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c}{(1-ic}\right.}{2e^3}$$

```
[Out] -1/8*b*c*d*x/(c^2*d-e)/e^2/(e*x^2+d)+1/4*b*c^4*d^2*arctan(c*x)/(c^2*d-e)^2/
e^3-b*c^2*d*arctan(c*x)/(c^2*d-e)/e^3-1/4*d^2*(a+b*arctan(c*x))/e^3/(e*x^2+
d)^2+d*(a+b*arctan(c*x))/e^3/(e*x^2+d)-(a+b*arctan(c*x))*ln(2/(1-I*c*x))/e^
3+1/2*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/
2)-I*e^(1/2)))/e^3+1/2*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I
*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^3+1/2*I*b*polylog(2,1-2/(1-I*c*x))/e^3-1/
4*I*b*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1
/2)))/e^3-1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^
(1/2)+I*e^(1/2)))/e^3+b*c*arctan(x*e^(1/2)/d^(1/2))*d^(1/2)/(c^2*d-e)/e^(5/
2)-1/8*b*c*(3*c^2*d-e)*arctan(x*e^(1/2)/d^(1/2))*d^(1/2)/(c^2*d-e)^2/e^(5/2
)
```

Rubi [A] time = 0.65, antiderivative size = 532, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 11, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.524, Rules used = {4980, 4974, 414, 522, 203, 205, 391, 4856, 2402, 2315, 2447}

$$-\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4e^3}-\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4e^3}+\frac{ib\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2e^3}-\frac{d^2\left(a+b\right.}{4e^3\left(d\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(x^5*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] -(b*c*d*x)/(8*(c^2*d - e)*e^2*(d + e*x^2)) + (b*c^4*d^2*ArcTan[c*x])/(4*(c^
2*d - e)^2*e^3) - (b*c^2*d*ArcTan[c*x])/((c^2*d - e)*e^3) - (d^2*(a + b*Arc
Tan[c*x]))/(4*e^3*(d + e*x^2)^2) + (d*(a + b*ArcTan[c*x]))/(e^3*(d + e*x^2)
) + (b*c*Sqrt[d]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/((c^2*d - e)*e^(5/2)) - (b*c*
Sqrt[d]*(3*c^2*d - e)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(8*(c^2*d - e)^2*e^(5/2)
) - ((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e^3 + ((a + b*ArcTan[c*x])*Log
[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*e
^3) + ((a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] +
I*Sqrt[e])*(1 - I*c*x))])/(2*e^3) + ((I/2)*b*PolyLog[2, 1 - 2/(1 - I*c*x)])
/e^3 - ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] -
I*Sqrt[e])*(1 - I*c*x))])/e^3 - ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sq
rt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/e^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 391

```
Int[1/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))), x_Symbol] :> Dis
t[b/(b*c - a*d), Int[1/(a + b*x^n), x], x] - Dist[d/(b*c - a*d), Int[1/(c +
 d*x^n), x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0]
```

Rule 414

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[1/(a*n*(p + 1)*(b*c - a*d)), Int[(a + b*x^n)^(p + 1)*(c +
d*x^n)^q*Simp[b*c + n*(p + 1)*(b*c - a*d) + d*b*(n*(p + q + 2) + 1)*x^n, x]
, x], x] /; FreeQ[{a, b, c, d, n, q}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1]
 &&  !( !IntegerQ[p] && IntegerQ[q] && LtQ[q, -1]) && IntBinomialQ[a, b, c,
 d, n, p, q, x]
```

Rule 522

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(
n_))), x_Symbol] :> Dist[(b*e - a*f)/(b*c - a*d), Int[1/(a + b*x^n), x], x]
 - Dist[(d*e - c*f)/(b*c - a*d), Int[1/(c + d*x^n), x], x] /; FreeQ[{a, b,
c, d, e, f, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{x^5\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx = \int \left(\frac{d^2x\left(a+b\tan^{-1}(cx)\right)}{e^2\left(d+ex^2\right)^3} - \frac{2dx\left(a+b\tan^{-1}(cx)\right)}{e^2\left(d+ex^2\right)^2} + \frac{x\left(a+b\tan^{-1}(cx)\right)}{e^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx}{e^2} - \frac{(2d)\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{e^2} + \frac{d^2\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx}{e^2}$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2} + \frac{d\left(a+b\tan^{-1}(cx)\right)}{e^3\left(d+ex^2\right)} - \frac{(bcd)\int \frac{1}{\left(1+c^2x^2\right)\left(d+ex^2\right)}\,dx}{e^3} + \frac{\left(bcd^2\right)\int \frac{}{(}$$

$$= -\frac{bcdx}{8\left(c^2d-e\right)e^2\left(d+ex^2\right)} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2} + \frac{d\left(a+b\tan^{-1}(cx)\right)}{e^3\left(d+ex^2\right)} + \frac{(bcd)\int \frac{2c^2}{(1+c}}{8\left(c^2d\right.}$$

$$= -\frac{bcdx}{8\left(c^2d-e\right)e^2\left(d+ex^2\right)} - \frac{bc^2d\tan^{-1}(cx)}{\left(c^2d-e\right)e^3} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2} + \frac{d\left(a+b\tan^{-1}(c\right.}{e^3\left(d+ex^2\right)}$$

$$= -\frac{bcdx}{8\left(c^2d-e\right)e^2\left(d+ex^2\right)} + \frac{bc^4d^2\tan^{-1}(cx)}{4\left(c^2d-e\right)^2e^3} - \frac{bc^2d\tan^{-1}(cx)}{\left(c^2d-e\right)e^3} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}$$

$$= -\frac{bcdx}{8\left(c^2d-e\right)e^2\left(d+ex^2\right)} + \frac{bc^4d^2\tan^{-1}(cx)}{4\left(c^2d-e\right)^2e^3} - \frac{bc^2d\tan^{-1}(cx)}{\left(c^2d-e\right)e^3} - \frac{d^2\left(a+b\tan^{-1}(cx)\right)}{4e^3\left(d+ex^2\right)^2}$$

Mathematica [A] time = 13.47, size = 589, normalized size = 1.11

$$a\left(\frac{d\left(3d+4ex^2\right)}{\left(d+ex^2\right)^2} + 2\log\left(d+ex^2\right)\right) + b\left(-\frac{cdex}{2\left(c^2d-e\right)\left(d+ex^2\right)} + \frac{c^2d\left(4e-3c^2d\right)\tan^{-1}(cx)}{\left(e-c^2d\right)^2} + \frac{c\sqrt{d}\sqrt{e}\left(5c^2d-7e\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\left(e-c^2d\right)^2} - i\mathrm{Li}_2\left(\frac{c\left(\sqrt{d}-i\right.}{c\sqrt{d}-}\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^5*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (a*((d*(3*d + 4*e*x^2))/(d + e*x^2)^2 + 2*Log[d + e*x^2]) + b*(-1/2*(c*d*e*
x)/((c^2*d - e)*(d + e*x^2)) + (c^2*d*(-3*c^2*d + 4*e)*ArcTan[c*x])/(-(c^2*
d) + e)^2 + (d*(3*d + 4*e*x^2)*ArcTan[c*x])/(d + e*x^2)^2 + (c*Sqrt[d]*(5*c
^2*d - 7*e)*Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*(-(c^2*d) + e)^2) + 2*A
rcTan[c*x]*Log[((-I)*Sqrt[d])/Sqrt[e] + x] + 2*ArcTan[c*x]*Log[(I*Sqrt[d])/
Sqrt[e] + x] + I*Log[((-I)*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(-1 - I*c*x))
/(c*Sqrt[d] - Sqrt[e])] - I*Log[((-I)*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1
 - I*c*x))/(c*Sqrt[d] + Sqrt[e])] - I*Log[(I*Sqrt[d])/Sqrt[e] + x]*Log[(Sqr
t[e]*(-1 + I*c*x))/(c*Sqrt[d] - Sqrt[e])] + I*Log[(I*Sqrt[d])/Sqrt[e] + x]*
Log[(Sqrt[e]*(1 + I*c*x))/(c*Sqrt[d] + Sqrt[e])] - I*PolyLog[2, (c*(Sqrt[d]
```

```
- I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])] + I*PolyLog[2, (c*(Sqrt[d] - I*Sqrt
[e]*x))/(c*Sqrt[d] + Sqrt[e])] + I*PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x))/(
c*Sqrt[d] - Sqrt[e])] - I*PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x))/(c*Sqrt[d]
 + Sqrt[e])]))/(4*e^3)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^5 \arctan(cx) + ax^5}{e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^5*arctan(c*x) + a*x^5)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.41, size = 959, normalized size = 1.80

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^5*(a+b*arctan(c*x))/(e*x^2+d)^3,x)
```

```
[Out] -1/4*c^4*a*d^2/e^3/(c^2*e*x^2+c^2*d)^2+c^2*a/e^3*d/(c^2*e*x^2+c^2*d)+1/2*a/
e^3*ln(c^2*e*x^2+c^2*d)-1/4*c^4*b*arctan(c*x)*d^2/e^3/(c^2*e*x^2+c^2*d)^2+c
^2*b*arctan(c*x)/e^3*d/(c^2*e*x^2+c^2*d)+1/2*b*arctan(c*x)/e^3*ln(c^2*e*x^2
+c^2*d)-1/8*c^5*b/e^2*d^2/(c^2*d-e)^2*x/(c^2*e*x^2+c^2*d)+1/8*c^3*b/e*d/(c^
2*d-e)^2*x/(c^2*e*x^2+c^2*d)+5/8*c^3*b/e^2*d^2/(c^2*d-e)^2/(d*e)^(1/2)*arct
an(e*x/(d*e)^(1/2))-7/8*c*b/e*d/(c^2*d-e)^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1
/2))-3/4*b*c^4*d^2*arctan(c*x)/(c^2*d-e)^2/e^3+c^2*b/e^2*d/(c^2*d-e)^2*arct
an(c*x)+1/4*I*b/e^3*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/R
ootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))-1/4*I*b/e^3*dilog((RootOf(e*_Z^2+2*
I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))+1/4
*I*b/e^3*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootO
f(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+1/4*I*b/e^3*ln(c^2*e*x^2+c^2*d)*ln(c*x-
I)+1/4*I*b/e^3*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/RootOf
(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/e^3*ln(c^2*e*x^2+c^2*d)*ln(I+c*x
)+1/4*I*b/e^3*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/
RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))-1/4*I*b/e^3*ln(c*x-I)*ln((RootOf(e
*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index
=2))-1/4*I*b/e^3*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+
I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/e^3*dilog((RootOf(e*_Z^
2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\,a\left(\frac{4\,dex^2 + 3\,d^2}{e^5x^4 + 2\,de^4x^2 + d^2e^3} + \frac{2\,\log\left(ex^2 + d\right)}{e^3}\right) + 2\,b\int \frac{x^5 \arctan(cx)}{2\left(e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^5*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((4*d*e*x^2 + 3*d^2)/(e^5*x^4 + 2*d*e^4*x^2 + d^2*e^3) + 2*log(e*x^2
+ d)/e^3) + 2*b*integrate(1/2*x^5*arctan(c*x)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^
2*e*x^2 + d^3), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^5\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^5*(a + b*atan(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^5*(a + b*atan(c*x)))/(d + e*x^2)^3, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**5*(a+b*atan(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1166 $\int \frac{x^3(a+b\tan^{-1}(cx))}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=130

$$\frac{x^4\left(a+b\tan^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{bc\left(c^2d-3e\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8\sqrt{d}\,e^{3/2}\left(c^2d-e\right)^2}+\frac{bcx}{8e\left(c^2d-e\right)\left(d+ex^2\right)}-\frac{b\tan^{-1}(cx)}{4d\left(c^2d-e\right)^2}$$

```
[Out] 1/8*b*c*x/(c^2*d-e)/e/(e*x^2+d)-1/4*b*arctan(c*x)/d/(c^2*d-e)^2+1/4*x^4*(a+
b*arctan(c*x))/d/(e*x^2+d)^2-1/8*b*c*(c^2*d-3*e)*arctan(x*e^(1/2)/d^(1/2))/
(c^2*d-e)^2/e^(3/2)/d^(1/2)
```

Rubi [A] time = 0.19, antiderivative size = 130, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {264, 4976, 12, 470, 522, 205}

$$\frac{x^4\left(a+b\tan^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{bc\left(c^2d-3e\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8\sqrt{d}\,e^{3/2}\left(c^2d-e\right)^2}+\frac{bcx}{8e\left(c^2d-e\right)\left(d+ex^2\right)}-\frac{b\tan^{-1}(cx)}{4d\left(c^2d-e\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c*x)/(8*(c^2*d - e)*e*(d + e*x^2)) - (b*ArcTan[c*x])/(4*d*(c^2*d - e)^2)
 + (x^4*(a + b*ArcTan[c*x]))/(4*d*(d + e*x^2)^2) - (b*c*(c^2*d - 3*e)*ArcTa
n[(Sqrt[e]*x)/Sqrt[d]])/(8*Sqrt[d]*(c^2*d - e)^2*e^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 470

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> -Simp[(a*e^(2*n - 1)*(e*x)^(m - 2*n + 1)*(a + b*x^n)^
(p + 1)*(c + d*x^n)^(q + 1))/(b*n*(b*c - a*d)*(p + 1)), x] + Dist[e^(2*n)/(
b*n*(b*c - a*d)*(p + 1)), Int[(e*x)^(m - 2*n)*(a + b*x^n)^(p + 1)*(c + d*x^
n)^q*Simp[a*c*(m - 2*n + 1) + (a*d*(m - n + n*q + 1) + b*c*n*(p + 1))*x^n,
x], x], x] /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[b*c - a*d, 0] && IGtQ[n,
0] && LtQ[p, -1] && GtQ[m - n + 1, n] && IntBinomialQ[a, b, c, d, e, m, n,
p, q, x]
```

Rule 522

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(
n_))), x_Symbol] :> Dist[(b*e - a*f)/(b*c - a*d), Int[1/(a + b*x^n), x], x]
```

```
 - Dist[(d*e - c*f)/(b*c - a*d), Int[1/(c + d*x^n), x], x] /; FreeQ[{a, b,
c, d, e, f, n}, x]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx = \frac{x^4\left(a+b\tan^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-(bc)\int \frac{x^4}{4\left(d+c^2dx^2\right)\left(d+ex^2\right)^2}\,dx$$

$$= \frac{x^4\left(a+b\tan^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{1}{4}(bc)\int \frac{x^4}{\left(d+c^2dx^2\right)\left(d+ex^2\right)^2}\,dx$$

$$= \frac{bcx}{8\left(c^2d-e\right)e\left(d+ex^2\right)}+\frac{x^4\left(a+b\tan^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{(bc)\int \frac{d^2+d\left(c^2d-2e\right)x^2}{\left(d+c^2dx^2\right)\left(d+ex^2\right)}\,dx}{8d\left(c^2d-e\right)e}$$

$$= \frac{bcx}{8\left(c^2d-e\right)e\left(d+ex^2\right)}+\frac{x^4\left(a+b\tan^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{(bc)\int \frac{1}{d+c^2dx^2}\,dx}{4\left(c^2d-e\right)^2}-\frac{\left(bc\left(c^2d-3e\right)\right)\int}{8\left(c^2d-e\right.}$$

$$= \frac{bcx}{8\left(c^2d-e\right)e\left(d+ex^2\right)}-\frac{b\tan^{-1}(cx)}{4d\left(c^2d-e\right)^2}+\frac{x^4\left(a+b\tan^{-1}(cx)\right)}{4d\left(d+ex^2\right)^2}-\frac{bc\left(c^2d-3e\right)\tan^{-1}\left(\right.}{8\sqrt{d}\left(c^2d-e\right)^2e}$$

Mathematica [A] time = 3.76, size = 158, normalized size = 1.22

$$\frac{\frac{-4ac^2d+4ae+bcex}{\left(c^2d-e\right)\left(d+ex^2\right)}+\frac{2ad}{\left(d+ex^2\right)^2}+\frac{2bc^2\left(c^2d-2e\right)\tan^{-1}(cx)}{\left(e-c^2d\right)^2}-\frac{bc\sqrt{e}\left(c^2d-3e\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}\left(e-c^2d\right)^2}-\frac{2b\tan^{-1}(cx)\left(d+2ex^2\right)}{\left(d+ex^2\right)^2}}{8e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] ((2*a*d)/(d + e*x^2)^2 + (-4*a*c^2*d + 4*a*e + b*c*e*x)/((c^2*d - e)*(d + e
*x^2)) + (2*b*c^2*(c^2*d - 2*e)*ArcTan[c*x])/(-(c^2*d) + e)^2 - (2*b*(d + 2
*e*x^2)*ArcTan[c*x])/(d + e*x^2)^2 - (b*c*(c^2*d - 3*e)*Sqrt[e]*ArcTan[(Sqr
t[e]*x)/Sqrt[d]])/(Sqrt[d]*(-(c^2*d) + e)^2))/(8*e^2)
```

fricas [B] time = 0.59, size = 697, normalized size = 5.36

$$\left[-\frac{4ac^4d^4-8ac^2d^3e+4ad^2e^2-2\left(bc^3d^2e^2-bcde^3\right)x^3+8\left(ac^4d^3e-2ac^2d^2e^2+ade^3\right)x^2-\left(bc^3d^3-3bcd^2e+\left(bc\right.\right.}{16\left(c^4d^5e^2-2c^2d^4e^3+d^3\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/16*(4*a*c^4*d^4 - 8*a*c^2*d^3*e + 4*a*d^2*e^2 - 2*(b*c^3*d^2*e^2 - b*c*
d*e^3)*x^3 + 8*(a*c^4*d^3*e - 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2 - (b*c^3*d^3 -
 3*b*c*d^2*e + (b*c^3*d*e^2 - 3*b*c*e^3)*x^4 + 2*(b*c^3*d^2*e - 3*b*c*d*e^2
)*x^2)*sqrt(-d*e)*log((e*x^2 - 2*sqrt(-d*e)*x - d)/(e*x^2 + d)) - 2*(b*c^3*
d^3*e - b*c*d^2*e^2)*x + 4*(2*b*d*e^3*x^2 + b*d^2*e^2 - (b*c^4*d^2*e^2 - 2*
b*c^2*d*e^3)*x^4)*arctan(c*x))/(c^4*d^5*e^2 - 2*c^2*d^4*e^3 + d^3*e^4 + (c^
4*d^3*e^4 - 2*c^2*d^2*e^5 + d*e^6)*x^4 + 2*(c^4*d^4*e^3 - 2*c^2*d^3*e^4 + d
^2*e^5)*x^2), -1/8*(2*a*c^4*d^4 - 4*a*c^2*d^3*e + 2*a*d^2*e^2 - (b*c^3*d^2*
e^2 - b*c*d*e^3)*x^3 + 4*(a*c^4*d^3*e - 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2 + (b
*c^3*d^3 - 3*b*c*d^2*e + (b*c^3*d*e^2 - 3*b*c*e^3)*x^4 + 2*(b*c^3*d^2*e - 3
*b*c*d*e^2)*x^2)*sqrt(d*e)*arctan(sqrt(d*e)*x/d) - (b*c^3*d^3*e - b*c*d^2*e
^2)*x + 2*(2*b*d*e^3*x^2 + b*d^2*e^2 - (b*c^4*d^2*e^2 - 2*b*c^2*d*e^3)*x^4)
*arctan(c*x))/(c^4*d^5*e^2 - 2*c^2*d^4*e^3 + d^3*e^4 + (c^4*d^3*e^4 - 2*c^2
*d^2*e^5 + d*e^6)*x^4 + 2*(c^4*d^4*e^3 - 2*c^2*d^3*e^4 + d^2*e^5)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.05, size = 297, normalized size = 2.28

$$\frac{c^4ad}{4e^2\left(c^2e\,x^2+c^2d\right)^2}-\frac{c^2a}{2e^2\left(c^2e\,x^2+c^2d\right)}+\frac{c^4b\arctan\left(cx\right)d}{4e^2\left(c^2e\,x^2+c^2d\right)^2}-\frac{c^2b\arctan\left(cx\right)}{2e^2\left(c^2e\,x^2+c^2d\right)}+\frac{c^5bdx}{8e\left(c^2d-e\right)^2\left(c^2e\,x^2+c^2d\right)}-\frac{}{8}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^3,x)
```

```
[Out] 1/4*c^4*a/e^2*d/(c^2*e*x^2+c^2*d)^2-1/2*c^2*a/e^2/(c^2*e*x^2+c^2*d)+1/4*c^4
*b*arctan(c*x)/e^2*d/(c^2*e*x^2+c^2*d)^2-1/2*c^2*b*arctan(c*x)/e^2/(c^2*e*x
^2+c^2*d)+1/8*c^5*b/e*d/(c^2*d-e)^2*x/(c^2*e*x^2+c^2*d)-1/8*c^3*b/(c^2*d-e)
^2*x/(c^2*e*x^2+c^2*d)-1/8*c^3*b/e*d/(c^2*d-e)^2/(d*e)^(1/2)*arctan(e*x/(d*
e)^(1/2))+3/8*c*b/(c^2*d-e)^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/4*c^4*b
/e^2*d/(c^2*d-e)^2*arctan(c*x)-1/2*c^2*b/e/(c^2*d-e)^2*arctan(c*x)
```

maxima [A] time = 0.42, size = 216, normalized size = 1.66

$$-\frac{1}{8}\left(c\left(\frac{\left(c^2d-3\,e\right)\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\left(c^4d^2e-2\,c^2de^2+e^3\right)\sqrt{de}}-\frac{x}{c^2d^2e-de^2+\left(c^2de^2-e^3\right)x^2}-\frac{2\left(c^4d-2\,c^2e\right)\arctan\left(cx\right)}{\left(c^4d^2e^2-2\,c^2de^3+e^4\right)c}\right)+\frac{2\left(2\,ex^2+d\right)}{e^4x^4+2\,de}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/8*(c*((c^2*d - 3*e)*arctan(e*x/sqrt(d*e))/((c^4*d^2*e - 2*c^2*d*e^2 + e^
3)*sqrt(d*e)) - x/(c^2*d^2*e - d*e^2 + (c^2*d*e^2 - e^3)*x^2) - 2*(c^4*d -
2*c^2*e)*arctan(c*x)/((c^4*d^2*e^2 - 2*c^2*d*e^3 + e^4)*c)) + 2*(2*e*x^2 +
d)*arctan(c*x)/(e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2))*b - 1/4*(2*e*x^2 + d)*a/(
e^4*x^4 + 2*d*e^3*x^2 + d^2*e^2)
```

mupad [B] time = 3.30, size = 273, normalized size = 2.10

$$\frac{b\,c^4\,d\,\mathrm{atan}\left(c\,x\right)}{4\,e^2\,{\left(e-c^2\,d\right)}^2}-\frac{a\,d}{4\,e^2\,{\left(e\,x^2+d\right)}^2}-\frac{b\,d\,\mathrm{atan}\left(c\,x\right)}{4\,e^2\,{\left(e\,x^2+d\right)}^2}-\frac{b\,c\,x^3}{8\,\left(e-c^2\,d\right)\,{\left(e\,x^2+d\right)}^2}-\frac{b\,c^2\,\mathrm{atan}\left(c\,x\right)}{2\,e\,{\left(e-c^2\,d\right)}^2}-\frac{b\,x^2\,\mathrm{atan}\left(c\,x\right)}{2\,e\,{\left(e\,x^2+d\right)}^2}-\frac{b\,c}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] (b*c^4*d*atan(c*x))/(4*e^2*(e - c^2*d)^2) - (a*d)/(4*e^2*(d + e*x^2)^2) - (
b*d*atan(c*x))/(4*e^2*(d + e*x^2)^2) - (b*c*x^3)/(8*(e - c^2*d)*(d + e*x^2)
^2) - (b*c^2*atan(c*x))/(2*e*(e - c^2*d)^2) - (b*x^2*atan(c*x))/(2*e*(d + e
*x^2)^2) - (b*c^3*atan((x*(-d*e^3)^(1/2)*1i)/(d*e))*(-d*e^3)^(1/2)*1i)/(8*e
^3*(e - c^2*d)^2) - (a*x^2)/(2*e*(d + e*x^2)^2) - (b*c*d*x)/(8*e*(e - c^2*d
)*(d + e*x^2)^2) + (b*c*atan((x*(-d*e^3)^(1/2)*1i)/(d*e))*(-d*e^3)^(1/2)*3i
)/(8*d*e^2*(e - c^2*d)^2)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1167 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=131

$$-\frac{a+b\tan^{-1}(cx)}{4e\left(d+ex^2\right)^2}-\frac{bc\left(3c^2d-e\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{8d^{3/2}\sqrt{e}\left(c^2d-e\right)^2}-\frac{bcx}{8d\left(c^2d-e\right)\left(d+ex^2\right)}+\frac{bc^4\tan^{-1}(cx)}{4e\left(c^2d-e\right)^2}$$

```
[Out] -1/8*b*c*x/d/(c^2*d-e)/(e*x^2+d)+1/4*b*c^4*arctan(c*x)/(c^2*d-e)^2/e+1/4*(-
a-b*arctan(c*x))/e/(e*x^2+d)^2-1/8*b*c*(3*c^2*d-e)*arctan(x*e^(1/2)/d^(1/2)
)/d^(3/2)/(c^2*d-e)^2/e^(1/2)
```

Rubi [A] time = 0.11, antiderivative size = 131, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 5, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.263, Rules used = {4974, 414, 522, 203, 205}

$$-\frac{a+b\tan^{-1}(cx)}{4e\left(d+ex^2\right)^2}-\frac{bc\left(3c^2d-e\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{8d^{3/2}\sqrt{e}\left(c^2d-e\right)^2}-\frac{bcx}{8d\left(c^2d-e\right)\left(d+ex^2\right)}+\frac{bc^4\tan^{-1}(cx)}{4e\left(c^2d-e\right)^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] -(b*c*x)/(8*d*(c^2*d - e)*(d + e*x^2)) + (b*c^4*ArcTan[c*x])/(4*(c^2*d - e)
^2*e) - (a + b*ArcTan[c*x])/(4*e*(d + e*x^2)^2) - (b*c*(3*c^2*d - e)*ArcTan
[(Sqrt[e]*x)/Sqrt[d]])/(8*d^(3/2)*(c^2*d - e)^2*Sqrt[e])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 414

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[1/(a*n*(p + 1)*(b*c - a*d)), Int[(a + b*x^n)^(p + 1)*(c +
d*x^n)^q*Simp[b*c + n*(p + 1)*(b*c - a*d) + d*b*(n*(p + q + 2) + 1)*x^n, x]
, x], x] /; FreeQ[{a, b, c, d, n, q}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1]
 &&  !( !IntegerQ[p] && IntegerQ[q] && LtQ[q, -1]) && IntBinomialQ[a, b, c,
 d, n, p, q, x]
```

Rule 522

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(
n_))), x_Symbol] :> Dist[(b*e - a*f)/(b*c - a*d), Int[1/(a + b*x^n), x], x]
 - Dist[(d*e - c*f)/(b*c - a*d), Int[1/(c + d*x^n), x], x] /; FreeQ[{a, b,
c, d, e, f, n}, x]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx = -\frac{a+b\tan^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{(bc)\int \frac{1}{\left(1+c^2x^2\right)\left(d+ex^2\right)^2}\,dx}{4e}$$

$$= -\frac{bcx}{8d\left(c^2d-e\right)\left(d+ex^2\right)}-\frac{a+b\tan^{-1}(cx)}{4e\left(d+ex^2\right)^2}+\frac{(bc)\int \frac{2c^2d-e-c^2ex^2}{\left(1+c^2x^2\right)\left(d+ex^2\right)}\,dx}{8d\left(c^2d-e\right)e}$$

$$= -\frac{bcx}{8d\left(c^2d-e\right)\left(d+ex^2\right)}-\frac{a+b\tan^{-1}(cx)}{4e\left(d+ex^2\right)^2}-\frac{\left(bc\left(3c^2d-e\right)\right)\int \frac{1}{d+ex^2}\,dx}{8d\left(c^2d-e\right)^2}+\frac{\left(bc^5\right)\int \frac{1}{1+c^2}}{4\left(c^2d-e\right.}$$

$$= -\frac{bcx}{8d\left(c^2d-e\right)\left(d+ex^2\right)}+\frac{bc^4\tan^{-1}(cx)}{4\left(c^2d-e\right)^2e}-\frac{a+b\tan^{-1}(cx)}{4e\left(d+ex^2\right)^2}-\frac{bc\left(3c^2d-e\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right.}{8d^{3/2}\left(c^2d-e\right)^2\sqrt{e}}$$

Mathematica [A] time = 1.19, size = 131, normalized size = 1.00

$$\frac{1}{8}\left(-\frac{\frac{2a}{e}+\frac{bcx\left(d+ex^2\right)}{d\left(c^2d-e\right)}}{\left(d+ex^2\right)^2}-\frac{bc\left(3c^2d-e\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{3/2}\sqrt{e}\left(e-c^2d\right)^2}+\frac{2b\tan^{-1}(cx)\left(\frac{c^4}{\left(e-c^2d\right)^2}-\frac{1}{\left(d+ex^2\right)^2}\right)}{e}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (-(((2*a)/e + (b*c*x*(d + e*x^2))/(d*(c^2*d - e)))/(d + e*x^2)^2) + (2*b*(c
^4/(-(c^2*d) + e)^2 - (d + e*x^2)^(-2))*ArcTan[c*x])/e - (b*c*(3*c^2*d - e)
*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(d^(3/2)*Sqrt[e]*(-(c^2*d) + e)^2))/8
```

fricas [B] time = 0.68, size = 637, normalized size = 4.86

$$\left[-\frac{4\,ac^4d^4-8\,ac^2d^3e+4\,ad^2e^2+2\left(bc^3d^2e^2-bcde^3\right)x^3-\left(3\,bc^3d^3-bcd^2e+\left(3\,bc^3de^2-bce^3\right)x^4+2\left(3\,bc^3d^2e-b\right.\right.}{16\left(c^4d^6e-2\,c^2d^5e^2+d^4e^3+\left(c^4d^4e^3-2\,c^2\right.\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] [-1/16*(4*a*c^4*d^4 - 8*a*c^2*d^3*e + 4*a*d^2*e^2 + 2*(b*c^3*d^2*e^2 - b*c*
d*e^3)*x^3 - (3*b*c^3*d^3 - b*c*d^2*e + (3*b*c^3*d*e^2 - b*c*e^3)*x^4 + 2*(
3*b*c^3*d^2*e - b*c*d*e^2)*x^2)*sqrt(-d*e)*log((e*x^2 - 2*sqrt(-d*e)*x - d)
/(e*x^2 + d)) + 2*(b*c^3*d^3*e - b*c*d^2*e^2)*x - 4*(b*c^4*d^2*e^2*x^4 + 2*
b*c^4*d^3*e*x^2 + 2*b*c^2*d^3*e - b*d^2*e^2)*arctan(c*x))/(c^4*d^6*e - 2*c^
2*d^5*e^2 + d^4*e^3 + (c^4*d^4*e^3 - 2*c^2*d^3*e^4 + d^2*e^5)*x^4 + 2*(c^4*
d^5*e^2 - 2*c^2*d^4*e^3 + d^3*e^4)*x^2), -1/8*(2*a*c^4*d^4 - 4*a*c^2*d^3*e
+ 2*a*d^2*e^2 + (b*c^3*d^2*e^2 - b*c*d*e^3)*x^3 + (3*b*c^3*d^3 - b*c*d^2*e
+ (3*b*c^3*d*e^2 - b*c*e^3)*x^4 + 2*(3*b*c^3*d^2*e - b*c*d*e^2)*x^2)*sqrt(d
```

```
*e)*arctan(sqrt(d*e)*x/d) + (b*c^3*d^3*e - b*c*d^2*e^2)*x - 2*(b*c^4*d^2*e^
2*x^4 + 2*b*c^4*d^3*e*x^2 + 2*b*c^2*d^3*e - b*d^2*e^2)*arctan(c*x))/(c^4*d^
6*e - 2*c^2*d^5*e^2 + d^4*e^3 + (c^4*d^4*e^3 - 2*c^2*d^3*e^4 + d^2*e^5)*x^4
 + 2*(c^4*d^5*e^2 - 2*c^2*d^4*e^3 + d^3*e^4)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 216, normalized size = 1.65

$$-\frac{c^4 a}{4e\left(c^2 e\,x^2+c^2 d\right)^2}-\frac{c^4 b\arctan\left(cx\right)}{4e\left(c^2 e\,x^2+c^2 d\right)^2}-\frac{c^5 bx}{8\left(c^2 d-e\right)^2\left(c^2 e\,x^2+c^2 d\right)}+\frac{c^3 bex}{8\left(c^2 d-e\right)^2 d\left(c^2 e\,x^2+c^2 d\right)}-\frac{3c^3 b\arctan}{8\left(c^2 d-e\right)^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(e*x^2+d)^3,x)
```

```
[Out] -1/4*c^4*a/e/(c^2*e*x^2+c^2*d)^2-1/4*c^4*b/e/(c^2*e*x^2+c^2*d)^2*arctan(c*x
)-1/8*c^5*b/(c^2*d-e)^2*x/(c^2*e*x^2+c^2*d)+1/8*c^3*b*e/(c^2*d-e)^2*x/d/(c^
2*e*x^2+c^2*d)-3/8*c^3*b/(c^2*d-e)^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/
8*c*b*e/(c^2*d-e)^2/d/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/4*b*c^4*arctan(
c*x)/(c^2*d-e)^2/e
```

maxima [A] time = 0.43, size = 185, normalized size = 1.41

$$\frac{1}{8}\left(\left(\left(\frac{2\,c^3\arctan\left(cx\right)}{c^4d^2e-2\,c^2de^2+e^3}-\frac{\left(3\,c^2d-e\right)\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\left(c^4d^3-2\,c^2d^2e+de^2\right)\sqrt{de}}-\frac{x}{c^2d^3-d^2e+\left(c^2d^2e-de^2\right)x^2}\right)c-\frac{2\,\arctan\left(cx\right)}{e^3x^4+2\,de^2x^2+d^2e}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*((2*c^3*arctan(c*x)/(c^4*d^2*e - 2*c^2*d*e^2 + e^3) - (3*c^2*d - e)*arc
tan(e*x/sqrt(d*e))/((c^4*d^3 - 2*c^2*d^2*e + d*e^2)*sqrt(d*e)) - x/(c^2*d^3
 - d^2*e + (c^2*d^2*e - d*e^2)*x^2))*c - 2*arctan(c*x)/(e^3*x^4 + 2*d*e^2*x
^2 + d^2*e))*b - 1/4*a/(e^3*x^4 + 2*d*e^2*x^2 + d^2*e)
```

mupad [B] time = 2.61, size = 201, normalized size = 1.53

$$\frac{b\,c\,x}{8\,\left(e-c^2\,d\right)\,\left(e\,x^2+d\right)^2}-\frac{b\,\mathrm{atan}\left(c\,x\right)}{4\,e\,\left(e\,x^2+d\right)^2}-\frac{a}{4\,e\,\left(e\,x^2+d\right)^2}+\frac{b\,c^4\,\mathrm{atan}\left(c\,x\right)}{4\,e\,\left(e-c^2\,d\right)^2}+\frac{b\,c\,e\,x^3}{8\,d\,\left(e-c^2\,d\right)\,\left(e\,x^2+d\right)^2}+\frac{b\,c\,\mathrm{atan}\left(\frac{x}{\ }\right.}{8\,d}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] (b*c*x)/(8*(e - c^2*d)*(d + e*x^2)^2) - (b*atan(c*x))/(4*e*(d + e*x^2)^2) -
 a/(4*e*(d + e*x^2)^2) + (b*c^4*atan(c*x))/(4*e*(e - c^2*d)^2) + (b*c*atan(
(x*(-d^3*e)^(1/2)*1i)/d^2)*(-d^3*e)^(1/2)*1i)/(8*d^3*(e - c^2*d)^2) - (b*c^
3*atan((x*(-d^3*e)^(1/2)*1i)/d^2)*(-d^3*e)^(1/2)*3i)/(8*d^2*e*(e - c^2*d)^2
) + (b*c*e*x^3)/(8*d*(e - c^2*d)*(d + e*x^2)^2)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1168 $\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=574

$$-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2d^3}-\frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2d^3}+\frac{\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(c\right.}{d^3}$$

```
[Out] 1/8*b*c*e*x/d^2/(c^2*d-e)/(e*x^2+d)-1/4*b*c^4*arctan(c*x)/d/(c^2*d-e)^2-1/2
*b*c^2*arctan(c*x)/d^2/(c^2*d-e)+1/4*(a+b*arctan(c*x))/d/(e*x^2+d)^2+1/2*(a
+b*arctan(c*x))/d^2/(e*x^2+d)+a*ln(x)/d^3+(a+b*arctan(c*x))*ln(2/(1-I*c*x))
/d^3-1/2*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^
(1/2)-I*e^(1/2)))/d^3-1/2*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(
1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^3-1/2*I*b*polylog(2,1-2/(1-I*c*x))/d^3
+1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e
^(1/2)))/d^3+1/4*I*b*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-
d)^(1/2)-I*e^(1/2)))/d^3-1/2*I*b*polylog(2,I*c*x)/d^3+1/2*I*b*polylog(2,-I*
c*x)/d^3+1/2*b*c*arctan(x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)/(c^2*d-e)+1/8*b*
c*(3*c^2*d-e)*arctan(x*e^(1/2)/d^(1/2))*e^(1/2)/d^(5/2)/(c^2*d-e)^2
```

Rubi [A] time = 0.63, antiderivative size = 574, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 13, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.619, Rules used = {4980, 4848, 2391, 4974, 414, 522, 203, 205, 391, 4856, 2402, 2315, 2447}

$$\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4d^3}+\frac{ib\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4d^3}+\frac{ib\text{PolyLog}(2,-icx)}{2d^3}-\frac{ib\text{PolyLog}(2\ldots}{2d^3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^3),x]
```

```
[Out] (b*c*e*x)/(8*d^2*(c^2*d - e)*(d + e*x^2)) - (b*c^4*ArcTan[c*x])/(4*d*(c^2*d
 - e)^2) - (b*c^2*ArcTan[c*x])/(2*d^2*(c^2*d - e)) + (a + b*ArcTan[c*x])/(4
*d*(d + e*x^2)^2) + (a + b*ArcTan[c*x])/(2*d^2*(d + e*x^2)) + (b*c*Sqrt[e]*
ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*d^(5/2)*(c^2*d - e)) + (b*c*(3*c^2*d - e)*S
qrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(8*d^(5/2)*(c^2*d - e)^2) + (a*Log[x])/
d^3 + ((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/d^3 - ((a + b*ArcTan[c*x])*L
og[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2
*d^3) - ((a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d]
+ I*Sqrt[e])*(1 - I*c*x))])/(2*d^3) + ((I/2)*b*PolyLog[2, (-I)*c*x])/d^3 -
((I/2)*b*PolyLog[2, I*c*x])/d^3 - ((I/2)*b*PolyLog[2, 1 - 2/(1 - I*c*x)])/d
^3 + ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*
Sqrt[e])*(1 - I*c*x))])/d^3 + ((I/4)*b*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt
[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/d^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 391

```
Int[1/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))), x_Symbol] :> Dis
t[b/(b*c - a*d), Int[1/(a + b*x^n), x], x] - Dist[d/(b*c - a*d), Int[1/(c +
 d*x^n), x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0]
```

Rule 414

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[1/(a*n*(p + 1)*(b*c - a*d)), Int[(a + b*x^n)^(p + 1)*(c +
d*x^n)^q*Simp[b*c + n*(p + 1)*(b*c - a*d) + d*b*(n*(p + q + 2) + 1)*x^n, x]
, x], x] /; FreeQ[{a, b, c, d, n, q}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1]
 &&  !( !IntegerQ[p] && IntegerQ[q] && LtQ[q, -1]) && IntBinomialQ[a, b, c,
 d, n, p, q, x]
```

Rule 522

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(
n_))), x_Symbol] :> Dist[(b*e - a*f)/(b*c - a*d), Int[1/(a + b*x^n), x], x]
 - Dist[(d*e - c*f)/(b*c - a*d), Int[1/(c + d*x^n), x], x] /; FreeQ[{a, b,
c, d, e, f, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
```

```
c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^3}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{d\left(d+ex^2\right)^3} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{d^2\left(d+ex^2\right)^2} - \frac{ex\left(a+b\tan^{-1}(c\right.}{d^3\left(d+ex^2\right)}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^3} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx}{d^3} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx}{d}$$

$$= \frac{a+b\tan^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\tan^{-1}(cx)}{2d^2\left(d+ex^2\right)} + \frac{a\log(x)}{d^3} + \frac{(ib)\int \frac{\log(1-icx)}{x}\,dx}{2d^3} - \frac{(ib)\int \frac{\log(1+icx)}{x}\,d}{2d^3}$$

$$= \frac{bcex}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} + \frac{a+b\tan^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\tan^{-1}(cx)}{2d^2\left(d+ex^2\right)} + \frac{a\log(x)}{d^3} + \frac{ib\mathrm{Li}_2(-icx)}{2d^3}$$

$$= \frac{bcex}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{bc^2\tan^{-1}(cx)}{2d^2\left(c^2d-e\right)} + \frac{a+b\tan^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\tan^{-1}(cx)}{2d^2\left(d+ex^2\right)} + \frac{bc\sqrt{e}\,\mathrm{t}}{2d^{5/2}}$$

$$= \frac{bcex}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{bc^4\tan^{-1}(cx)}{4d\left(c^2d-e\right)^2} - \frac{bc^2\tan^{-1}(cx)}{2d^2\left(c^2d-e\right)} + \frac{a+b\tan^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\tan}{2d^2\left(d+\right.}$$

$$= \frac{bcex}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{bc^4\tan^{-1}(cx)}{4d\left(c^2d-e\right)^2} - \frac{bc^2\tan^{-1}(cx)}{2d^2\left(c^2d-e\right)} + \frac{a+b\tan^{-1}(cx)}{4d\left(d+ex^2\right)^2} + \frac{a+b\tan}{2d^2\left(d+\right.}$$

Mathematica [A] time = 14.42, size = 645, normalized size = 1.12

$$2a\left(\frac{d\left(3d+2ex^2\right)}{\left(d+ex^2\right)^2} - 2\log\left(d+ex^2\right) + 4\log(x)\right) + b\left(\frac{cdex}{\left(c^2d-e\right)\left(d+ex^2\right)} + \frac{2c^2d\left(2e-3c^2d\right)\tan^{-1}(cx)}{\left(e-c^2d\right)^2} + \frac{c\sqrt{d}\sqrt{e}\left(7c^2d-5e\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\left(e-c^2d\right)^2} + \right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^3),x]
```

```
[Out] (2*a*((d*(3*d + 2*e*x^2))/(d + e*x^2)^2 + 4*Log[x] - 2*Log[d + e*x^2]) + b*
((c*d*e*x)/((c^2*d - e)*(d + e*x^2)) + (2*c^2*d*(-3*c^2*d + 2*e)*ArcTan[c*x
])/(-(c^2*d) + e)^2 + (2*d*(3*d + 2*e*x^2)*ArcTan[c*x])/(d + e*x^2)^2 + (c*
Sqrt[d]*(7*c^2*d - 5*e)*Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(-(c^2*d) + e)
^2 + 8*ArcTan[c*x]*Log[x] - 4*ArcTan[c*x]*Log[((-I)*Sqrt[d])/Sqrt[e] + x] -
 4*ArcTan[c*x]*Log[(I*Sqrt[d])/Sqrt[e] + x] - (2*I)*Log[((-I)*Sqrt[d])/Sqrt
[e] + x]*Log[(Sqrt[e]*(-1 - I*c*x))/(c*Sqrt[d] - Sqrt[e])] + (2*I)*Log[((-I
)*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1 - I*c*x))/(c*Sqrt[d] + Sqrt[e])] +
(2*I)*Log[(I*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(-1 + I*c*x))/(c*Sqrt[d] -
Sqrt[e])] - (2*I)*Log[(I*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1 + I*c*x))/(c
*Sqrt[d] + Sqrt[e])] - (4*I)*(Log[x]*(Log[1 - I*c*x] - Log[1 + I*c*x]) - Po
lyLog[2, (-I)*c*x] + PolyLog[2, I*c*x]) + (2*I)*PolyLog[2, (c*(Sqrt[d] - I*
Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])] - (2*I)*PolyLog[2, (c*(Sqrt[d] - I*Sqrt[
e]*x))/(c*Sqrt[d] + Sqrt[e])] - (2*I)*PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x)
)/(c*Sqrt[d] - Sqrt[e])] + (2*I)*PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x))/(c*
Sqrt[d] + Sqrt[e])])))/(8*d^3)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b\arctan\left(cx\right)+a}{e^{3}x^{7}+3\,de^{2}x^{5}+3\,d^{2}ex^{3}+d^{3}x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2*e*x^3 + d^3*x),
 x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_{0}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.36, size = 1041, normalized size = 1.81

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(e*x^2+d)^3,x)
```

```
[Out] -1/4*I*b/d^3*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I)/R
ootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+1/4*I*b/d^3*ln(c*x-I)*ln((RootOf(e*
_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=
2))+1/2*I*b/d^3*ln(c*x)*ln(1+I*c*x)-1/2*I*b/d^3*ln(c*x)*ln(1-I*c*x)+1/4*I*b
/d^3*ln(I+c*x)*ln(c^2*e*x^2+c^2*d)+1/2*b*c^2*arctan(c*x)/d^2/(c^2*e*x^2+c^2
*d)+1/4*b*c^4*arctan(c*x)/d/(c^2*e*x^2+c^2*d)^2-1/4*I*b/d^3*ln(c*x-I)*ln(c^
2*e*x^2+c^2*d)-1/4*I*b/d^3*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,ind
ex=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))+1/4*I*b/d^3*ln(c*x-I)
*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+
c^2*d-e,index=1))-5/8*b*c/d^2/(c^2*d-e)^2*e^2/(d*e)^(1/2)*arctan(e*x/(d*e)^
(1/2))+1/8*b*c^5*e/(c^2*d-e)^2*x/d/(c^2*e*x^2+c^2*d)-1/8*b*c^3/d^2*e^2/(c^2
*d-e)^2*x/(c^2*e*x^2+c^2*d)+7/8*b*c^3*e/(c^2*d-e)^2/d/(d*e)^(1/2)*arctan(e*
x/(d*e)^(1/2))+1/4*I*b/d^3*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c
*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))+1/2*I*b/d^3*dilog(1+I*c*x)-1
/2*b*arctan(c*x)/d^3*ln(c^2*e*x^2+c^2*d)+b*arctan(c*x)/d^3*ln(c*x)+1/2*a*c^
```

```
2/d^2/(c^2*e*x^2+c^2*d)+1/4*a*c^4/d/(c^2*e*x^2+c^2*d)^2+1/4*I*b/d^3*dilog((
RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d
-e,index=1))-1/4*I*b/d^3*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x
-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1/4*I*b/d^3*dilog((RootOf(e*_Z
^2-2*I*_Z*e+c^2*d-e,index=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)
)-1/2*I*b/d^3*dilog(1-I*c*x)+a/d^3*ln(c*x)+1/2*b*c^2/d^2/(c^2*d-e)^2*arctan
(c*x)*e-1/2*a/d^3*ln(c^2*e*x^2+c^2*d)-3/4*b*c^4*arctan(c*x)/d/(c^2*d-e)^2
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\,a\left(\frac{2\,ex^2+3\,d}{d^2e^2x^4+2\,d^3ex^2+d^4}-\frac{2\,\log\left(ex^2+d\right)}{d^3}+\frac{4\,\log(x)}{d^3}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/4*a*((2*e*x^2 + 3*d)/(d^2*e^2*x^4 + 2*d^3*e*x^2 + d^4) - 2*log(e*x^2 + d)
/d^3 + 4*log(x)/d^3) + 2*b*integrate(1/2*arctan(c*x)/(e^3*x^7 + 3*d*e^2*x^5
 + 3*d^2*e*x^3 + d^3*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x\,{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + e*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1169 $\int \frac{a+b\tan^{-1}(cx)}{x^3(d+ex^2)^3}\,dx$

Optimal. Leaf size=629

$$-\frac{3e\log\left(\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^4}+\frac{3e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2d^4}+\frac{3e\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}\right.}{(1-icx)\left(c\sqrt{\right.}}\right.}{2d^4}$$

```
[Out] -1/2*b*c/d^3/x-1/8*b*c*e^2*x/d^3/(c^2*d-e)/(e*x^2+d)-1/2*b*c^2*arctan(c*x)/
d^3+1/4*b*c^4*e*arctan(c*x)/d^2/(c^2*d-e)^2+b*c^2*e*arctan(c*x)/d^3/(c^2*d-
e)+1/2*(-a-b*arctan(c*x))/d^3/x^2-1/4*e*(a+b*arctan(c*x))/d^2/(e*x^2+d)^2-e
*(a+b*arctan(c*x))/d^3/(e*x^2+d)-b*c*e^(3/2)*arctan(x*e^(1/2)/d^(1/2))/d^(7
/2)/(c^2*d-e)-1/8*b*c*(3*c^2*d-e)*e^(3/2)*arctan(x*e^(1/2)/d^(1/2))/d^(7/2)
/(c^2*d-e)^2-3*a*e*ln(x)/d^4-3*e*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/d^4+3/2*
e*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I
*e^(1/2)))/d^4+3/2*e*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c
*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^4+3/2*I*b*e*polylog(2,I*c*x)/d^4+3/2*I*b*e*
polylog(2,1-2/(1-I*c*x))/d^4-3/4*I*b*e*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2
))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^4-3/4*I*b*e*polylog(2,1-2*c*((-d)^
(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^4-3/2*I*b*e*polylog(
2,-I*c*x)/d^4
```

Rubi [A] time = 0.68, antiderivative size = 629, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 15, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.714, Rules used = {4980, 4852, 325, 203, 4848, 2391, 4974, 414, 522, 205, 391, 4856, 2402, 2315, 2447}

$$-\frac{3ibe\text{PolyLog}(2,-icx)}{2d^4}+\frac{3ibe\text{PolyLog}(2,icx)}{2d^4}+\frac{3ibe\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2d^4}-\frac{3ibe\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right.}{4d^4}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] -(b*c)/(2*d^3*x) - (b*c*e^2*x)/(8*d^3*(c^2*d - e)*(d + e*x^2)) - (b*c^2*Arc
Tan[c*x])/(2*d^3) + (b*c^4*e*ArcTan[c*x])/(4*d^2*(c^2*d - e)^2) + (b*c^2*e*
ArcTan[c*x])/(d^3*(c^2*d - e)) - (a + b*ArcTan[c*x])/(2*d^3*x^2) - (e*(a +
b*ArcTan[c*x]))/(4*d^2*(d + e*x^2)^2) - (e*(a + b*ArcTan[c*x]))/(d^3*(d + e
*x^2)) - (b*c*e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(d^(7/2)*(c^2*d - e)) -
(b*c*(3*c^2*d - e)*e^(3/2)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(8*d^(7/2)*(c^2*d -
 e)^2) - (3*a*e*Log[x])/d^4 - (3*e*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/
d^4 + (3*e*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d
] - I*Sqrt[e])*(1 - I*c*x))])/(2*d^4) + (3*e*(a + b*ArcTan[c*x])*Log[(2*c*(
Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*d^4) - (
((3*I)/2)*b*e*PolyLog[2, (-I)*c*x])/d^4 + (((3*I)/2)*b*e*PolyLog[2, I*c*x])
/d^4 + (((3*I)/2)*b*e*PolyLog[2, 1 - 2/(1 - I*c*x)])/d^4 - (((3*I)/4)*b*e*P
olyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I
*c*x))])/d^4 - (((3*I)/4)*b*e*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/(
(c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/d^4
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 391

```
Int[1/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(n_))), x_Symbol] :> Dis
t[b/(b*c - a*d), Int[1/(a + b*x^n), x], x] - Dist[d/(b*c - a*d), Int[1/(c +
 d*x^n), x], x] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0]
```

Rule 414

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[1/(a*n*(p + 1)*(b*c - a*d)), Int[(a + b*x^n)^(p + 1)*(c +
d*x^n)^q*Simp[b*c + n*(p + 1)*(b*c - a*d) + d*b*(n*(p + q + 2) + 1)*x^n, x]
, x], x] /; FreeQ[{a, b, c, d, n, q}, x] && NeQ[b*c - a*d, 0] && LtQ[p, -1]
 &&  !( !IntegerQ[p] && IntegerQ[q] && LtQ[q, -1]) && IntBinomialQ[a, b, c,
 d, n, p, q, x]
```

Rule 522

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*((c_) + (d_.)*(x_)^(
n_))), x_Symbol] :> Dist[(b*e - a*f)/(b*c - a*d), Int[1/(a + b*x^n), x], x]
 - Dist[(d*e - c*f)/(b*c - a*d), Int[1/(c + d*x^n), x], x] /; FreeQ[{a, b,
c, d, e, f, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^3}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^3x^3} - \frac{3e\left(a+b\tan^{-1}(cx)\right)}{d^4x} + \frac{e^2x\left(a+b\tan^{-1}(cx)\right)}{d^2\left(d+ex^2\right)^3} + \frac{2e^2x\left(a+b\tan^{-1}\right.}{d^3\left(d+ex^2\right.}\right.$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^3}\,dx}{d^3} - \frac{(3e)\int \frac{a+b\tan^{-1}(cx)}{x}\,dx}{d^4} + \frac{\left(3e^2\right)\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx}{d^4} + \frac{\left(2e^2\right)\int \frac{x(a+b\tan}{(d+ex}}{d^3}$$

$$= -\frac{a+b\tan^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^3\left(d+ex^2\right)} - \frac{3ae\log(x)}{d^4} + \frac{(bc)\int \frac{}{x^2(}}{2}$$

$$= -\frac{bc}{2d^3x} - \frac{bce^2x}{8d^3\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{a+b\tan^{-1}(cx)}{2d^3x^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\tan\right.}{d^3\left(d+\right.}$$

$$= -\frac{bc}{2d^3x} - \frac{bce^2x}{8d^3\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{bc^2\tan^{-1}(cx)}{2d^3} + \frac{bc^2e\tan^{-1}(cx)}{d^3\left(c^2d-e\right)} - \frac{a+b\tan^{-1}(cx)}{2d^3x^2} -$$

$$= -\frac{bc}{2d^3x} - \frac{bce^2x}{8d^3\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{bc^2\tan^{-1}(cx)}{2d^3} + \frac{bc^4e\tan^{-1}(cx)}{4d^2\left(c^2d-e\right)^2} + \frac{bc^2e\tan^{-1}(cx)}{d^3\left(c^2d-e\right)} -$$

$$= -\frac{bc}{2d^3x} - \frac{bce^2x}{8d^3\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{bc^2\tan^{-1}(cx)}{2d^3} + \frac{bc^4e\tan^{-1}(cx)}{4d^2\left(c^2d-e\right)^2} + \frac{bc^2e\tan^{-1}(cx)}{d^3\left(c^2d-e\right)} -$$

Mathematica [A] time = 17.83, size = 723, normalized size = 1.15

$$-a\left(\frac{d\left(2d^2+9dex^2+6e^2x^4\right)}{x^2\left(d+ex^2\right)^2} - 6e\log\left(d+ex^2\right) + 12e\log(x)\right) + b\left(\frac{c\sqrt{d}\,e^{3/2}\left(9e-11c^2d\right)\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{2\left(e-c^2d\right)^2} - \frac{cde^2x}{2\left(c^2d-e\right)\left(d+ex^2\right)} + \frac{c^2d\left(-2c^4d\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^3),x]
```

```
[Out] (-(a*((d*(2*d^2 + 9*d*e*x^2 + 6*e^2*x^4))/(x^2*(d + e*x^2)^2) + 12*e*Log[x]
 - 6*e*Log[d + e*x^2])) + b*((-2*c*d)/x - (c*d*e^2*x)/(2*(c^2*d - e)*(d + e
*x^2)) + (c^2*d*(-2*c^4*d^2 + 9*c^2*d*e - 6*e^2)*ArcTan[c*x])/(-(c^2*d) + e
)^2 - (d*(2*d^2 + 9*d*e*x^2 + 6*e^2*x^4)*ArcTan[c*x])/(x^2*(d + e*x^2)^2) +
 (c*Sqrt[d]*e^(3/2)*(-11*c^2*d + 9*e)*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(2*(-(c^
2*d) + e)^2) - 12*e*ArcTan[c*x]*Log[x] + 6*e*ArcTan[c*x]*(Log[((-I)*Sqrt[d]
)/Sqrt[e] + x] + Log[(I*Sqrt[d])/Sqrt[e] + x] - Log[d + e*x^2]) + 6*e*ArcTa
n[c*x]*Log[d + e*x^2] - (6*I)*e*(Log[x]*Log[1 + I*c*x] + PolyLog[2, (-I)*c*
x]) + (6*I)*e*(Log[x]*Log[1 - I*c*x] + PolyLog[2, I*c*x]) - (3*I)*e*(Log[(I
*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(-1 + I*c*x))/(c*Sqrt[d] - Sqrt[e])] +
PolyLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])]) + (3*I)*e*(L
og[(I*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1 + I*c*x))/(c*Sqrt[d] + Sqrt[e])
] + PolyLog[2, (c*(Sqrt[d] - I*Sqrt[e]*x))/(c*Sqrt[d] + Sqrt[e])]) + (3*I)*
e*(Log[((-I)*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(-1 - I*c*x))/(c*Sqrt[d] -
Sqrt[e])] + PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x))/(c*Sqrt[d] - Sqrt[e])])
- (3*I)*e*(Log[((-I)*Sqrt[d])/Sqrt[e] + x]*Log[(Sqrt[e]*(1 - I*c*x))/(c*Sqr
t[d] + Sqrt[e])] + PolyLog[2, (c*(Sqrt[d] + I*Sqrt[e]*x))/(c*Sqrt[d] + Sqrt
[e])])))/(4*d^4)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx)+a}{e^3x^9+3\,de^2x^7+3\,d^2ex^5+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 0.38, size = 1128, normalized size = 1.79

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^3,x)
```

```
[Out] -1/4*c^4*b*arctan(c*x)*e/d^2/(c^2*e*x^2+c^2*d)^2-3/2*c^2*b/d^3/(c^2*d-e)^2*
arctan(c*x)*e^2+1/8*c^3*b/d^3*e^3/(c^2*d-e)^2*x/(c^2*e*x^2+c^2*d)-1/8*c^5*b
/d^2*e^2/(c^2*d-e)^2*x/(c^2*e*x^2+c^2*d)+9/8*c*b/d^3*e^3/(c^2*d-e)^2/(d*e)^
(1/2)*arctan(e*x/(d*e)^(1/2))-11/8*c^3*b/d^2/(c^2*d-e)^2*e^2/(d*e)^(1/2)*ar
ctan(e*x/(d*e)^(1/2))+3/4*I*b/d^4*e*dilog((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,i
ndex=2)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))-3/4*I*b/d^4*e*dilog
((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2
*d-e,index=1))-3/4*I*b/d^4*e*dilog((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)
-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2))-3/2*I*b/d^4*e*dilog(1+I*c*
x)+3/2*I*b/d^4*e*dilog(1-I*c*x)+3/4*I*b/d^4*e*dilog((RootOf(e*_Z^2-2*I*_Z*e
+c^2*d-e,index=1)-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))-1/4*c^4*a
*e/d^2/(c^2*e*x^2+c^2*d)^2-c^2*a*e/d^3/(c^2*e*x^2+c^2*d)-1/2*c^6*b/d/(c^2*d
-e)^2*arctan(c*x)+3/2*b*arctan(c*x)*e/d^4*ln(c^2*e*x^2+c^2*d)-1/2*b*arctan(
c*x)/d^3/x^2-3*a/d^4*e*ln(c*x)+3/2*a*e/d^4*ln(c^2*e*x^2+c^2*d)-1/2*b*c/d^3/
x+3/4*I*b/d^4*e*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1)-c*x-I
)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=1))+9/4*b*c^4*e*arctan(c*x)/d^2/(c^2
*d-e)^2+3/4*I*b/d^4*e*ln(I+c*x)*ln((RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2)
-c*x-I)/RootOf(e*_Z^2-2*I*_Z*e+c^2*d-e,index=2))-3/2*I*b/d^4*e*ln(c*x)*ln(1
+I*c*x)-3/4*I*b/d^4*e*ln(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1)
-c*x+I)/RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=1))+3/4*I*b/d^4*e*ln(c*x-I)*ln
(c^2*e*x^2+c^2*d)-c^2*b*arctan(c*x)*e/d^3/(c^2*e*x^2+c^2*d)-3/4*I*b/d^4*e*l
n(c*x-I)*ln((RootOf(e*_Z^2+2*I*_Z*e+c^2*d-e,index=2)-c*x+I)/RootOf(e*_Z^2+2
*I*_Z*e+c^2*d-e,index=2))+3/2*I*b/d^4*e*ln(c*x)*ln(1-I*c*x)-3/4*I*b/d^4*e*l
n(I+c*x)*ln(c^2*e*x^2+c^2*d)-1/2*a/d^3/x^2-3*b*arctan(c*x)/d^4*e*ln(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{4}a\left(\frac{6\,e^2x^4+9\,dex^2+2\,d^2}{d^3e^2x^6+2\,d^4ex^4+d^5x^2}-\frac{6\,e\log\left(ex^2+d\right)}{d^4}+\frac{12\,e\log(x)}{d^4}\right)+2\,b\int\frac{\arctan(cx)}{2\left(e^3x^9+3\,de^2x^7+3\,d^2ex^5+d^3x^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/4*a*((6*e^2*x^4 + 9*d*e*x^2 + 2*d^2)/(d^3*e^2*x^6 + 2*d^4*e*x^4 + d^5*x^
2) - 6*e*log(e*x^2 + d)/d^4 + 12*e*log(x)/d^4) + 2*b*integrate(1/2*arctan(c
*x)/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2*e*x^5 + d^3*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b \operatorname{atan}(c x)}{x^3 \left(e x^2 + d\right)^3} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1170 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx$

Optimal. Leaf size=966

$$\frac{ib\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}+\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{3/2}e^{3/2}}-\frac{ib\log\left(-\frac{\sqrt{e}\left(\sqrt{-c^2}\,x+1\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{3/2}e^{3/2}}-\frac{ib\log\left(-\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log\left(\frac{i\sqrt{e}\,x}{\sqrt{d}}+\right.}{32\sqrt{-c^2}\,d^{3/2}e^{3/2}}$$

```
[Out] 1/8*b*c/(c^2*d-e)/e/(e*x^2+d)-1/4*x*(a+b*arctan(c*x))/e/(e*x^2+d)^2+1/8*x*(
a+b*arctan(c*x))/d/e/(e*x^2+d)+1/8*(a+b*arctan(c*x))*arctan(x*e^(1/2)/d^(1/
2))/d^(3/2)/e^(3/2)+1/16*b*c*(5*c^2*d-3*e)*ln(c^2*x^2+1)/d/(c^2*d-e)^2/e-1/
4*b*c*ln(c^2*x^2+1)/d/(c^2*d-e)/e-1/16*b*c*(5*c^2*d-3*e)*ln(e*x^2+d)/d/(c^2
*d-e)^2/e+1/4*b*c*ln(e*x^2+d)/d/(c^2*d-e)/e-1/32*I*b*c*polylog(2,(-c^2)^(1/
2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))/d^(3/2)/e^(3/2)/
(-c^2)^(1/2)+1/32*I*b*c*ln((1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/
2)+e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))/d^(3/2)/e^(3/2)/(-c^2)^(1/2)+1/32*I*
b*c*ln((1-x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1-I*
x*e^(1/2)/d^(1/2))/d^(3/2)/e^(3/2)/(-c^2)^(1/2)+1/32*I*b*c*polylog(2,(-c^2)
^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)-I*e^(1/2)))/d^(3/2)/e^(3
/2)/(-c^2)^(1/2)+1/32*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((
-c^2)^(1/2)*d^(1/2)-I*e^(1/2)))/d^(3/2)/e^(3/2)/(-c^2)^(1/2)-1/32*I*b*c*ln(
-(1-x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)-e^(1/2)))*ln(1+I*x*e^(1
/2)/d^(1/2))/d^(3/2)/e^(3/2)/(-c^2)^(1/2)-1/32*I*b*c*ln(-(1+x*(-c^2)^(1/2))
*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)-e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))/d^(3/2
)/e^(3/2)/(-c^2)^(1/2)-1/32*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/
2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))/d^(3/2)/e^(3/2)/(-c^2)^(1/2)
```

Rubi [A] time = 2.26, antiderivative size = 966, normalized size of antiderivative = 1.00, number of steps used = 49, number of rules used = 15, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.714, Rules used = {4980, 199, 205, 4912, 6725, 571, 77, 4908, 2409, 2394, 2393, 2391, 444, 36, 31}

$$\frac{ib\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}+\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{3/2}e^{3/2}}-\frac{ib\log\left(-\frac{\sqrt{e}\left(\sqrt{-c^2}\,x+1\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{3/2}e^{3/2}}-\frac{ib\log\left(-\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log\left(\frac{i\sqrt{e}\,x}{\sqrt{d}}+\right.}{32\sqrt{-c^2}\,d^{3/2}e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] (b*c)/(8*(c^2*d - e)*e*(d + e*x^2)) - (x*(a + b*ArcTan[c*x]))/(4*e*(d + e*x
^2)^2) + (x*(a + b*ArcTan[c*x]))/(8*d*e*(d + e*x^2)) + ((a + b*ArcTan[c*x])
*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(8*d^(3/2)*e^(3/2)) + ((I/32)*b*c*Log[(Sqrt[e
]*(1 - Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 - (I*Sqrt[e]*
x)/Sqrt[d]])/(Sqrt[-c^2]*d^(3/2)*e^(3/2)) - ((I/32)*b*c*Log[-((Sqrt[e]*(1 +
 Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 - (I*Sqrt[e]*x)/Sq
rt[d]])/(Sqrt[-c^2]*d^(3/2)*e^(3/2)) - ((I/32)*b*c*Log[-((Sqrt[e]*(1 - Sqrt
[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]
])/(Sqrt[-c^2]*d^(3/2)*e^(3/2)) + ((I/32)*b*c*Log[(Sqrt[e]*(1 + Sqrt[-c^2]*
x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 + (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt
[-c^2]*d^(3/2)*e^(3/2)) + (b*c*(5*c^2*d - 3*e)*Log[1 + c^2*x^2])/(16*d*(c^2
*d - e)^2*e) - (b*c*Log[1 + c^2*x^2])/(4*d*(c^2*d - e)*e) - (b*c*(5*c^2*d -
 3*e)*Log[d + e*x^2])/(16*d*(c^2*d - e)^2*e) + (b*c*Log[d + e*x^2])/(4*d*(c
^2*d - e)*e) + ((I/32)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x))/
(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])])/(Sqrt[-c^2]*d^(3/2)*e^(3/2)) - ((I/32)*b
*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] + I*
```

```
Sqrt[e])])/(Sqrt[-c^2]*d^(3/2)*e^(3/2)) + ((I/32)*b*c*PolyLog[2, (Sqrt[-c^2
]*(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])])/(Sqrt[-c^2]*d
^(3/2)*e^(3/2)) - ((I/32)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] + I*Sqrt[e]*x
))/(Sqrt[-c^2]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2]*d^(3/2)*e^(3/2))
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 571

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^3}\,dx=\int\left(-\frac{d\left(a+b\tan^{-1}(cx)\right)}{e\left(d+ex^2\right)^3}+\frac{a+b\tan^{-1}(cx)}{e\left(d+ex^2\right)^2}\right)dx$$

$$=\frac{\int\frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx}{e}-\frac{d\int\frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^3}\,dx}{e}$$

$$=-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{8d^{3/2}e^{3/2}}-\frac{(b\cdots}{\cdots}$$

$$=-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{8d^{3/2}e^{3/2}}-\frac{(b\cdots}{\cdots}$$

$$=-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{8d^{3/2}e^{3/2}}+\frac{(3\cdots}{\cdots}$$

$$=-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{8d^{3/2}e^{3/2}}+\frac{(3\cdots}{\cdots}$$

$$=-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)\tan^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d}}\right)}{8d^{3/2}e^{3/2}}+\frac{(b\cdots}{\cdots}$$

$$=\frac{bc}{8\left(c^2d-e\right)e\left(d+ex^2\right)}-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}\cdots\right.}{8\cdots}$$

$$=\frac{bc}{8\left(c^2d-e\right)e\left(d+ex^2\right)}-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}\cdots\right.}{8\cdots}$$

$$=\frac{bc}{8\left(c^2d-e\right)e\left(d+ex^2\right)}-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}\cdots\right.}{8\cdots}$$

$$=\frac{bc}{8\left(c^2d-e\right)e\left(d+ex^2\right)}-\frac{x\left(a+b\tan^{-1}(cx)\right)}{4e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{8de\left(d+ex^2\right)}+\frac{\left(a+b\tan^{-1}\cdots\right.}{8\cdots}$$

Mathematica [A] time = 13.07, size = 1914, normalized size = 1.98

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^3,x]
```

```
[Out] -1/4*(a*x)/(e*(d + e*x^2)^2) + (a*x)/(8*d*e*(d + e*x^2)) + (a*ArcTan[(Sqrt[
e]*x)/Sqrt[d]])/(8*d^(3/2)*e^(3/2)) + b*c^3*(-1/16*Log[1 - ((-(c^2*d) + e)*
Cos[2*ArcTan[c*x]])/(c^2*d + e)]/(c^2*d*(c^2*d - e)^2) - Log[1 - ((-(c^2*d)
 + e)*Cos[2*ArcTan[c*x]])/(c^2*d + e)]/(16*(c^2*d - e)^2*e) - (4*ArcTan[c*x
]*ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + 2*ArcCos[(-(c^2*d) - e)/(c^2*d - e)
]*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]] - (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] -
 (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[1 - ((c^2*d + e - (2*I)*Sqrt[
-(c^2*d*e)])*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*
c*Sqrt[-(c^2*d*e)]*x))] + (-ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcT
anh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[1 - ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)]
)*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^
2*d*e)]*x))] + (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*(ArcTanh[(c*d)/(
Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqr
t[-(c^2*d*e)])/(Sqrt[c^2*d - e]*E^(I*ArcTan[c*x])*Sqrt[c^2*d + e + (c^2*d -
 e)*Cos[2*ArcTan[c*x]]])] + (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] + (2*I)*(Ar
cTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log
[(Sqrt[2]*Sqrt[-(c^2*d*e)]*E^(I*ArcTan[c*x]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d +
 e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] + I*(PolyLog[2, ((c^2*d + e - (2*I)*
Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d
 + 2*c*Sqrt[-(c^2*d*e)]*x))] - PolyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*
e)])*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-
(c^2*d*e)]*x))]))/(32*c^2*d*(c^2*d - e)*Sqrt[-(c^2*d*e)]) + (4*ArcTan[c*x]*
ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + 2*ArcCos[(-(c^2*d) - e)/(c^2*d - e)]*
ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]] - (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (
2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[1 - ((c^2*d + e - (2*I)*Sqrt[-(
c^2*d*e)])*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*
Sqrt[-(c^2*d*e)]*x))] + (-ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcTan
h[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[1 - ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*
(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*
d*e)]*x))] + (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*(ArcTanh[(c*d)/(Sq
rt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[
-(c^2*d*e)])/(Sqrt[c^2*d - e]*E^(I*ArcTan[c*x])*Sqrt[c^2*d + e + (c^2*d - e
)*Cos[2*ArcTan[c*x]]])] + (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] + (2*I)*(ArcT
anh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(
Sqrt[2]*Sqrt[-(c^2*d*e)]*E^(I*ArcTan[c*x]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d + e
 + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] + I*(PolyLog[2, ((c^2*d + e - (2*I)*Sq
rt[-(c^2*d*e)])*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d +
 2*c*Sqrt[-(c^2*d*e)]*x))] - PolyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)
])*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c
^2*d*e)]*x))]))/(32*(c^2*d - e)*e*Sqrt[-(c^2*d*e)]) + (ArcTan[c*x]*Sin[2*Ar
cTan[c*x]])/(2*(c^2*d - e)*(c^2*d + e + c^2*d*Cos[2*ArcTan[c*x]] - e*Cos[2*
ArcTan[c*x]])^2) + (-2*c^2*d*e - c^4*d^2*ArcTan[c*x]*Sin[2*ArcTan[c*x]] + e
^2*ArcTan[c*x]*Sin[2*ArcTan[c*x]])/(8*c^2*d*(c^2*d - e)^2*e*(c^2*d + e + c^
2*d*Cos[2*ArcTan[c*x]] - e*Cos[2*ArcTan[c*x]])))
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bx^2\arctan(cx)+ax^2}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arctan(c*x) + a*x^2)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 +
 d^3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 1.08, size = 3801, normalized size = 3.93

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^3,x)
```

```
[Out] 1/16*I*c^3*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/e^2*arctan(c*x)*ln(1-(
c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+1/16*I/c*b*(
c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/d^2*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*
c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+1/8*a/d/e/(d*e)^(1/2)*arct
an(e*x/(d*e)^(1/2))+1/8*c^4*a/(c^2*e*x^2+c^2*d)^2/d*x^3-1/16*b*(d*e)^(1/2)*
e/d^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)
^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)-1/4*c*b/(c^4*d^2-2*c^2*d*e+e^2)*e
/d/(c^2*d-e)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))-1/16*c^7*b*d^2*arctan(c*x)^2/e
^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-1/32/c*b*e^2*polylog(2,(c^2*d-
e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/d^2/(c^4*d^2-2*c^2
*d*e+e^2)^2*(c^2*e*d)^(1/2)-1/32*c^7*b*d^2*polylog(2,(c^2*d-e)*(1+I*c*x)^2/
(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/e^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^
2*e*d)^(1/2)+1/32*c^3*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/e^2*polylog
(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+1/32/c*b
*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/d^2*polylog(2,(c^2*d-e)*(1+I*c*x)^
2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+1/16/c*b*(c^2*e*d)^(1/2)/(c^4*d
^2-2*c^2*d*e+e^2)/d^2*arctan(c*x)^2-1/8*c^7*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*
e*x^2+c^2*d)^2*d*x^2-1/8*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*
e*x^2-1/8*c^7*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*x^4+1/16*c^3*
b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/e^2*arctan(c*x)^2-1/16*c^4*b*(d*e
)^(1/2)/e^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c
/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)+1/4*I*c^5*b*d*ln(1-(c^2*d-e)*(1+I*c*x
)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/e/(c^4*d^2-2*c^2*
d*e+e^2)^2*(c^2*e*d)^(1/2)-1/8*I*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c
^2*d)^2*e^2/d*arctan(c*x)*x^4-1/8*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+
c^2*d)^2*d-3/16*c^3*b*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2
*(c^2*e*d)^(1/2)-e))/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-3/8*c^3*b*ar
ctan(c*x)^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-1/16*b*(d*e)^(1/2)/d^
2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/
2))/(c^4*d^2-2*c^2*d*e+e^2)-1/8*c*b*(c^2*e*d)^(1/2)/d/e/(c^4*d^2-2*c^2*d*e+
e^2)*arctan(c*x)^2+1/4*c*b*e*arctan(c*x)^2/d/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2
*e*d)^(1/2)-1/16/c*b*e^2*arctan(c*x)^2/d^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e
*d)^(1/2)-1/16*c^2*b*(d*e)^(1/2)/d*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^
2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)-1/16
*c*b*(c^2*e*d)^(1/2)/d/e/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c
*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+1/4*c^5*b*d*arctan(c*x)^2/e
/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-1/8*c^2*b*(d*e)^(1/2)/d/e*arctan
h(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4
*d^2-2*c^2*d*e+e^2)+1/4*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/e*d/(c^2*d-e)*ln((1+I
*c*x)/(c^2*x^2+1)^(1/2))+1/8*c^5*b*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2
+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/e/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/
2)*d-1/16*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/e*d/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x
^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c
^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-1/8*c^4*a/(c^2*e*x^2+c^2*d)^2/e*x+1/4*c
^6*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*d*arctan(c*x)*x-1/8*c^4*b/
(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*arctan(c*x)*x+1/8*c^8*b/(c^4*
d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*d*arctan(c*x)*x^3-1/4*c^6*b/(c^4*d^2
```

```
-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*arctan(c*x)*x^3+1/16*c^4*b*(d*e)^(1/2
)/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(
1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)+1/16*c*b/(c^4*d^2-2*c^2*d*e+e^2)*e/
d/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2
+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+1/8*c*
b*e*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e
))/d/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-3/8*I*c^3*b*ln(1-(c^2*d-e)*(
1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^4*d^2-2
*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-1/8*I*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*
x^2+c^2*d)^2*d*arctan(c*x)-1/8*I*c*b*(c^2*e*d)^(1/2)/d/e/(c^4*d^2-2*c^2*d*e
+e^2)*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d
)^(1/2)-e))+1/4*I*c*b*e*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c
^2*e*d)^(1/2)-e))*arctan(c*x)/d/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-1
/16*I/c*b*e^2*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1
/2)-e))*arctan(c*x)/d^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-1/16*I*c^
7*b*d^2*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e)
)*arctan(c*x)/e^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-1/8*c^8*b/(c^4*
d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2/e*d^2*arctan(c*x)*x+1/8*c^4*b/(c^4*d
^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e^2/d*arctan(c*x)*x^3+1/16*c^6*b*(d*e
)^(1/2)*d/e^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)
/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)-1/8*I*c^7*b/(c^4*d^2-2*c^
2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*arctan(c*x)*x^4-1/4*I*c^7*b/(c^4*d^2-2*c^2
*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*d*arctan(c*x)*x^2-1/4*I*c^5*b/(c^4*d^2-2*c^2*
d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*arctan(c*x)*x^2-1/8*I*c^7*b/(c^4*d^2-2*c^2*d
*e+e^2)/(c^2*e*x^2+c^2*d)^2/e*d^2*arctan(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}a\left(\frac{ex^3-dx}{de^3x^4+2d^2e^2x^2+d^3e}+\frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,de}\right)+2b\int\frac{x^2\arctan(cx)}{2\left(e^3x^6+3de^2x^4+3d^2ex^2+d^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*a*((e*x^3 - d*x)/(d*e^3*x^4 + 2*d^2*e^2*x^2 + d^3*e) + arctan(e*x/sqrt(
d*e))/(sqrt(d*e)*d*e)) + 2*b*integrate(1/2*x^2*arctan(c*x)/(e^3*x^6 + 3*d*e
^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^3,x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1171 $\int \frac{a+b\tan^{-1}(cx)}{(d+ex^2)^3}\,dx$

Optimal. Leaf size=893

$$\frac{3ib\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}+\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{5/2}\sqrt{e}}-\frac{3ib\log\left(-\frac{\sqrt{e}\left(\sqrt{-c^2}\,x+1\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{5/2}\sqrt{e}}-\frac{3ib\log\left(-\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log(\cdots}{32\sqrt{-c^2}\,d^{5/2}\sqrt{e}}$$

```
[Out] -1/8*b*c/d/(c^2*d-e)/(e*x^2+d)+1/4*x*(a+b*arctan(c*x))/d/(e*x^2+d)^2+3/8*x*
(a+b*arctan(c*x))/d^2/(e*x^2+d)-1/16*b*c*(5*c^2*d-3*e)*ln(c^2*x^2+1)/d^2/(c
^2*d-e)^2+1/16*b*c*(5*c^2*d-3*e)*ln(e*x^2+d)/d^2/(c^2*d-e)^2+3/8*(a+b*arcta
n(c*x))*arctan(x*e^(1/2)/d^(1/2))/d^(5/2)/e^(1/2)-3/32*I*b*c*ln(-(1+x*(-c^2
)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)-e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2)
)/d^(5/2)/(-c^2)^(1/2)/e^(1/2)+3/32*I*b*c*ln((1-x*(-c^2)^(1/2))*e^(1/2)/(I*
(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))/d^(5/2)/(-c^2)^(1/
2)/e^(1/2)-3/32*I*b*c*ln(-(1-x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2
)-e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))/d^(5/2)/(-c^2)^(1/2)/e^(1/2)+3/32*I*b
*c*ln((1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1+I*x
*e^(1/2)/d^(1/2))/d^(5/2)/(-c^2)^(1/2)/e^(1/2)+3/32*I*b*c*polylog(2,(-c^2)^
(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)-I*e^(1/2)))/d^(5/2)/(-c^2
)^(1/2)/e^(1/2)-3/32*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-
c^2)^(1/2)*d^(1/2)+I*e^(1/2)))/d^(5/2)/(-c^2)^(1/2)/e^(1/2)+3/32*I*b*c*poly
log(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)-I*e^(1/2)))/
d^(5/2)/(-c^2)^(1/2)/e^(1/2)-3/32*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x
*e^(1/2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))/d^(5/2)/(-c^2)^(1/2)/e^(1/2)
```

Rubi [A] time = 0.95, antiderivative size = 893, normalized size of antiderivative = 1.00, number of steps used = 23, number of rules used = 11, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}} = 0.611$, Rules used = {199, 205, 4912, 6725, 571, 77, 4908, 2409, 2394, 2393, 2391}

$$\frac{3ib\log\left(\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}+\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{5/2}\sqrt{e}}-\frac{3ib\log\left(-\frac{\sqrt{e}\left(\sqrt{-c^2}\,x+1\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log\left(1-\frac{i\sqrt{e}\,x}{\sqrt{d}}\right)c}{32\sqrt{-c^2}\,d^{5/2}\sqrt{e}}-\frac{3ib\log\left(-\frac{\sqrt{e}\left(1-\sqrt{-c^2}\,x\right)}{i\sqrt{-c^2}\,\sqrt{d}-\sqrt{e}}\right)\log(\cdots}{32\sqrt{-c^2}\,d^{5/2}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + e*x^2)^3,x]
```

```
[Out] -(b*c)/(8*d*(c^2*d - e)*(d + e*x^2)) + (x*(a + b*ArcTan[c*x]))/(4*d*(d + e*
x^2)^2) + (3*x*(a + b*ArcTan[c*x]))/(8*d^2*(d + e*x^2)) + (3*(a + b*ArcTan[
c*x])*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(8*d^(5/2)*Sqrt[e]) + (((3*I)/32)*b*c*Lo
g[(Sqrt[e]*(1 - Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 - (I
*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(5/2)*Sqrt[e]) - (((3*I)/32)*b*c*Log[-(
(Sqrt[e]*(1 + Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 - (I*
Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(5/2)*Sqrt[e]) - (((3*I)/32)*b*c*Log[-((
Sqrt[e]*(1 - Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 + (I*S
qrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(5/2)*Sqrt[e]) + (((3*I)/32)*b*c*Log[(Sqr
t[e]*(1 + Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 + (I*Sqrt[
e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(5/2)*Sqrt[e]) - (b*c*(5*c^2*d - 3*e)*Log[1 +
 c^2*x^2])/(16*d^2*(c^2*d - e)^2) + (b*c*(5*c^2*d - 3*e)*Log[d + e*x^2])/(1
6*d^2*(c^2*d - e)^2) + (((3*I)/32)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*
Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])])/(Sqrt[-c^2]*d^(5/2)*Sqrt[e])
 - (((3*I)/32)*b*c*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x))/(Sqrt[-c
^2]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2]*d^(5/2)*Sqrt[e]) + (((3*I)/32)*b*c*P
olyLog[2, (Sqrt[-c^2]*(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt
```

```
[e])])/(Sqrt[-c^2]*d^(5/2)*Sqrt[e]) - (((3*I)/32)*b*c*PolyLog[2, (Sqrt[-c^2
]*(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2]*d
^(5/2)*Sqrt[e])
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 571

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{(d+ex^2)^3}\,dx = \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx))\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{5/2}\sqrt{e}} - (bc)\int$$

$$= \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx))\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{5/2}\sqrt{e}} - (bc)\int$$

$$= \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx))\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{5/2}\sqrt{e}} - \frac{(bc)\int}{}$$

$$= \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx))\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{5/2}\sqrt{e}} - \frac{(bc)\,\mathrm{Sub}}{}$$

$$= \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx))\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{8d^{5/2}\sqrt{e}} - \frac{(bc)\,\mathrm{Sub}}{}$$

$$= -\frac{bc}{8d(c^2d-e)(d+ex^2)} + \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx}{8d^{5/2}}$$

$$= -\frac{bc}{8d(c^2d-e)(d+ex^2)} + \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx}{8d^{5/2}}$$

$$= -\frac{bc}{8d(c^2d-e)(d+ex^2)} + \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx}{8d^{5/2}}$$

$$= -\frac{bc}{8d(c^2d-e)(d+ex^2)} + \frac{x(a+b\tan^{-1}(cx))}{4d(d+ex^2)^2} + \frac{3x(a+b\tan^{-1}(cx))}{8d^2(d+ex^2)} + \frac{3(a+b\tan^{-1}(cx}{8d^{5/2}}$$

Mathematica [A] time = 12.82, size = 1745, normalized size = 1.95

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + e*x^2)^3,x]
```

```
[Out] (a*x)/(4*d*(d + e*x^2)^2) + (3*a*x)/(8*d^2*(d + e*x^2)) + (3*a*ArcTan[(Sqrt
[e]*x)/Sqrt[d]])/(8*d^(5/2)*Sqrt[e]) + (b*c*(10*c^2*d*Log[1 + ((c^2*d - e)*
Cos[2*ArcTan[c*x]])/(c^2*d + e)] - 6*e*Log[1 + ((c^2*d - e)*Cos[2*ArcTan[c*
x]])/(c^2*d + e)] + (3*c^2*d*(c^2*d - e)*(-4*ArcTan[c*x]*ArcTanh[Sqrt[-(c^2
```

```
*d*e)]/(c*e*x)] + 2*ArcCos[-((c^2*d + e)/(c^2*d - e))]*ArcTanh[(c*e*x)/Sqrt
[-(c^2*d*e)]] - (ArcCos[-((c^2*d + e)/(c^2*d - e))] + (2*I)*ArcTanh[(c*e*x)
/Sqrt[-(c^2*d*e)]])*Log[(2*c^2*d*((-I)*e + Sqrt[-(c^2*d*e)])*(-I + c*x))/((
c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] - (ArcCos[-((c^2*d + e)/(c^2*d
- e))] - (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(2*c^2*d*(I*e + Sqrt[
-(c^2*d*e)])*(I + c*x))/((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] + (Ar
cCos[-((c^2*d + e)/(c^2*d - e))] - (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x
)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sq
rt[c^2*d - e]*E^(I*ArcTan[c*x])*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c
*x]]])] + (ArcCos[-((c^2*d + e)/(c^2*d - e))] + (2*I)*(ArcTanh[(c*d)/(Sqrt[
-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c
^2*d*e)]*E^(I*ArcTan[c*x]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d + e + (c^2*d - e)*C
os[2*ArcTan[c*x]]])] + I*(PolyLog[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*
(c^2*d - c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x)
)] - PolyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(c^2*d - c*Sqrt[-(c^2
*d*e)]*x))/((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))]))/Sqrt[-(c^2*d*e)
] - (3*(c^2*d - e)*e*(-4*ArcTan[c*x]*ArcTanh[Sqrt[-(c^2*d*e)]/(c*e*x)] + 2*
ArcCos[-((c^2*d + e)/(c^2*d - e))]*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]] - (Arc
Cos[-((c^2*d + e)/(c^2*d - e))] + (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*
Log[(2*c^2*d*((-I)*e + Sqrt[-(c^2*d*e)])*(-I + c*x))/((c^2*d - e)*(c^2*d +
c*Sqrt[-(c^2*d*e)]*x))] - (ArcCos[-((c^2*d + e)/(c^2*d - e))] - (2*I)*ArcTa
nh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(2*c^2*d*(I*e + Sqrt[-(c^2*d*e)])*(I + c*
x))/((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] + (ArcCos[-((c^2*d + e)/(
c^2*d - e))] - (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)
/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sqrt[c^2*d - e]*E^(I*A
rcTan[c*x])*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] + (ArcCos[-(
(c^2*d + e)/(c^2*d - e))] + (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + Ar
cTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)]*E^(I*ArcTan
[c*x]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])]
 + I*(PolyLog[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(c^2*d - c*Sqrt[-(c^
2*d*e)]*x))/((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] - PolyLog[2, ((c^
2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(c^2*d - c*Sqrt[-(c^2*d*e)]*x))/((c^2*d -
 e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))])))/Sqrt[-(c^2*d*e)] - (16*c^2*d*(c^2*d
 - e)*e*ArcTan[c*x]*Sin[2*ArcTan[c*x]])/(c^2*d + e + (c^2*d - e)*Cos[2*ArcT
an[c*x]])^2 + (8*c^2*d*e + 4*(5*c^4*d^2 - 8*c^2*d*e + 3*e^2)*ArcTan[c*x]*Si
n[2*ArcTan[c*x]])/(c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]])))/(32*d^2*(-
(c^2*d) + e)^2)
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b \arctan(cx) + a}{e^3x^6 + 3\,de^2x^4 + 3\,d^2ex^2 + d^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^3*x^6 + 3*d*e^2*x^4 + 3*d^2*e*x^2 + d^3), x
)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 1.99, size = 4027, normalized size = 4.51

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

[In] int((a+b*arctan(c*x))/(e*x^2+d)^3,x)

[Out] 1/8*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e+3/8*c^2*a/d^2*x/(c^2*e*x^2+c^2*d)+5/16*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-5/4*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))+3/8*c^5*b*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+3/4*c^5*b*arctan(c*x)^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+3/4*c*b*e^2*arctan(c*x)^2/d^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+3/8*c*b*e^2*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/d^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+3/16*c^4*b*(d*e)^(1/2)/d*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)-3/16*b*(d*e)^(1/2)/d^3*e^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)-3/8*I*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*arctan(c*x)+3/8*a/d^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/8*c^7*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*x^2-3/16*c*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/d^2*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))-3/8*c*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/d^2*arctan(c*x)^2+1/8*c^2*b*(d*e)^(1/2)/d^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)-3/16*b*(d*e)^(1/2)/d^3*e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)+1/4*c^4*a*x/d/(c^2*e*x^2+c^2*d)^2+5/8*I*c^7*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*d*arctan(c*x)+3/4*I*c^5*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+1/8*c^7*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2/d*x^4*e^2+1/8*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2/d*x^2*e^2+3/32*c^3*b*(c^2*e*d)^(1/2)/d/e/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))-3/16*c^7*b*d*arctan(c*x)^2/e/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+2*c^3*b/(c^4*d^2-2*c^2*d*e+e^2)*e/d/(c^2*d-e)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))+3/16/c*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/d^3*e*arctan(c*x)^2-3/16/c*b*e^3*arctan(c*x)^2/d^3/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-3/32/c*b*e^3*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/d^3/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+3/32/c*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/d^3*e*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))-3/32*c^7*b*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/e/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)*d-5/16*c^6*b*(d*e)^(1/2)/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)-1/2*c^3*b/(c^4*d^2-2*c^2*d*e+e^2)*e/d/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)-9/16*c^3*b*e*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))/d/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+3/16*c^3*b*(c^2*e*d)^(1/2)/d/e/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^2-9/8*c^3*b*e*arctan(c*x)^2/d/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+5/16*c^4*b*(d*e)^(1/2)/d/e*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)-3/4*c*b/(c^4*d^2-2*c^2*d*e+e^2)/d^2*e^2/(c^2*d-e)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))+5/8*c^8*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*d*arctan(c*x)*x-5/4*c^6*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*arctan(c*x)*x+3/8*c^8*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2*e*arctan(c*x)*x^3+3/16*c*b/(c^4*d^2-2*c^2*d*e+e^2)/d^2*e^2/(c^2*d-e)*ln((1+I*c*x)^4/(c^2*x^2+1)^2*c^2*d+2*c^2*d*(1+I*c*x)^2/(c^2*x^2+1)-(1+I*c*x)^4/(c^2*x^2+1)^2*e+c^2*d+2*(1+I*c*x)^2/(c^2*x^2+1)*e-e)+3/4*I*c*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)*e^2/d^2/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)-9/8*I*c^3*b*e*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/

```
(-c^2*d+2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/d/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*
e*d)^(1/2)+3/16*I*c^3*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/e/d*arctan(
c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))-3
/16*I*c^7*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2
)-e))*arctan(c*x)/e/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)*d+5/8*I*c^7*b
/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2/d*arctan(c*x)*x^4*e^2-3/8*I*c^
5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2/d^2*arctan(c*x)*x^4*e^3-3/4
*I*c^5*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e*x^2+c^2*d)^2/d*arctan(c*x)*x^2*e^2-
3/16*I/c*b*e^3*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(
1/2)-e))*arctan(c*x)/d^3/(c^4*d^2-2*c^2*d*e+e^2)^2*(c^2*e*d)^(1/2)+3/16*I/c
*b*(c^2*e*d)^(1/2)/(c^4*d^2-2*c^2*d*e+e^2)/d^3*e*arctan(c*x)*ln(1-(c^2*d-e)
*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+5/16*c^2*b*(d*e)^(1/
2)*e/d^2*arctanh(1/4*(2*(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)+2*c^2*d+2*e)/c/(d
*e)^(1/2))/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*d-e)+3/8*c^4*b/(c^4*d^2-2*c^2*d*e+e
^2)/(c^2*e*x^2+c^2*d)^2/d^2*arctan(c*x)*x^3*e^3+5/8*c^4*b/(c^4*d^2-2*c^2*d*
e+e^2)/(c^2*e*x^2+c^2*d)^2/d*arctan(c*x)*x*e^2-3/4*c^6*b/(c^4*d^2-2*c^2*d*e
+e^2)/(c^2*e*x^2+c^2*d)^2*e^2/d*arctan(c*x)*x^3-3/8*I*c*b*(c^2*e*d)^(1/2)/(
c^4*d^2-2*c^2*d*e+e^2)/d^2*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+
1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))+5/4*I*c^7*b/(c^4*d^2-2*c^2*d*e+e^2)/(c^2*e
*x^2+c^2*d)^2*arctan(c*x)*x^2*e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}a\left(\frac{3ex^3+5dx}{d^2e^2x^4+2d^3ex^2+d^4}+\frac{3\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d^2}\right)+2b\int\frac{\arctan(cx)}{2\left(e^3x^6+3de^2x^4+3d^2ex^2+d^3\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] 1/8*a*((3*e*x^3 + 5*d*x)/(d^2*e^2*x^4 + 2*d^3*e*x^2 + d^4) + 3*arctan(e*x/s
qrt(d*e))/(sqrt(d*e)*d^2)) + 2*b*integrate(1/2*arctan(c*x)/(e^3*x^6 + 3*d*e
^2*x^4 + 3*d^2*e*x^2 + d^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + e*x^2)^3,x)
```

```
[Out] int((a + b*atan(c*x))/(d + e*x^2)^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1172 $\int \frac{a+b\tan^{-1}(cx)}{x^2(d+ex^2)^3}\,dx$

Optimal. Leaf size=1518

$$-\frac{7x\left(a+b\tan^{-1}(cx)\right)e}{8d^3\left(ex^2+d\right)}-\frac{x\left(a+b\tan^{-1}(cx)\right)e}{4d^2\left(ex^2+d\right)^2}+\frac{bc\log\left(c^2x^2+1\right)e}{4d^3\left(c^2d-e\right)}+\frac{bc\left(5c^2d-3e\right)\log\left(c^2x^2+1\right)e}{16d^3\left(c^2d-e\right)^2}-\frac{bc\log\left(ex^2+\right.}{4d^3\left(c^2d-\right.}$$

```
[Out] (-a-b*arctan(c*x))/d^3/x+b*c*ln(x)/d^3-1/2*b*c*ln(c^2*x^2+1)/d^3-7/8*(a+b*a
rctan(c*x))*arctan(x*e^(1/2)/d^(1/2))*e^(1/2)/d^(7/2)-a*arctan(x*e^(1/2)/d^
(1/2))*e^(1/2)/d^(7/2)-1/4*I*b*polylog(2,(1-I*c*x)*e^(1/2)/(I*c*(-d)^(1/2)+
e^(1/2)))*e^(1/2)/(-d)^(7/2)-1/4*I*b*polylog(2,(1+I*c*x)*e^(1/2)/(I*c*(-d)^
(1/2)+e^(1/2)))*e^(1/2)/(-d)^(7/2)+1/4*I*b*polylog(2,(I-c*x)*e^(1/2)/(c*(-d
)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(7/2)+1/4*I*b*polylog(2,(I+c*x)*e^(1/2)/(c
*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(7/2)-7/32*I*b*c*ln((1-x*(-c^2)^(1/2))
*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)+e^(1/2)))*ln(1-I*x*e^(1/2)/d^(1/2))*e^(1/2
)/d^(7/2)/(-c^2)^(1/2)-7/32*I*b*c*ln((1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(
1/2)*d^(1/2)+e^(1/2)))*ln(1+I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(7/2)/(-c^2)^(1/
2)+7/32*I*b*c*ln(-(1+x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)-e^(1/2
)))*ln(1-I*x*e^(1/2)/d^(1/2))*e^(1/2)/d^(7/2)/(-c^2)^(1/2)+7/32*I*b*c*ln(-(
1-x*(-c^2)^(1/2))*e^(1/2)/(I*(-c^2)^(1/2)*d^(1/2)-e^(1/2)))*ln(1+I*x*e^(1/2
)/d^(1/2))*e^(1/2)/d^(7/2)/(-c^2)^(1/2)+7/32*I*b*c*polylog(2,(-c^2)^(1/2)*(
d^(1/2)-I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)+I*e^(1/2)))*e^(1/2)/d^(7/2)/(-c^
2)^(1/2)+7/32*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^2)^(1
/2)*d^(1/2)+I*e^(1/2)))*e^(1/2)/d^(7/2)/(-c^2)^(1/2)+1/16*b*c*(5*c^2*d-3*e)
*e*ln(c^2*x^2+1)/d^3/(c^2*d-e)^2-1/16*b*c*(5*c^2*d-3*e)*e*ln(e*x^2+d)/d^3/(
c^2*d-e)^2-7/32*I*b*c*polylog(2,(-c^2)^(1/2)*(d^(1/2)-I*x*e^(1/2))/((-c^2)^
(1/2)*d^(1/2)-I*e^(1/2)))*e^(1/2)/d^(7/2)/(-c^2)^(1/2)-7/32*I*b*c*polylog(2
,(-c^2)^(1/2)*(d^(1/2)+I*x*e^(1/2))/((-c^2)^(1/2)*d^(1/2)-I*e^(1/2)))*e^(1/
2)/d^(7/2)/(-c^2)^(1/2)-1/4*e*x*(a+b*arctan(c*x))/d^2/(e*x^2+d)^2-7/8*e*x*(
a+b*arctan(c*x))/d^3/(e*x^2+d)+1/4*b*c*e*ln(c^2*x^2+1)/d^3/(c^2*d-e)-1/4*b*
c*e*ln(e*x^2+d)/d^3/(c^2*d-e)-1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2
))/(c*(-d)^(1/2)-I*e^(1/2)))*e^(1/2)/(-d)^(7/2)-1/4*I*b*ln(1-I*c*x)*ln(c*((
-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)-I*e^(1/2)))*e^(1/2)/(-d)^(7/2)+1/4*I*b*l
n(1-I*c*x)*ln(c*((-d)^(1/2)-x*e^(1/2))/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-
d)^(7/2)+1/4*I*b*ln(1+I*c*x)*ln(c*((-d)^(1/2)+x*e^(1/2))/(c*(-d)^(1/2)+I*e^
(1/2)))*e^(1/2)/(-d)^(7/2)+1/8*b*c*e/d^2/(c^2*d-e)/(e*x^2+d)
```

Rubi [A] time = 2.64, antiderivative size = 1518, normalized size of antiderivative = 1.00, number of steps used = 73, number of rules used = 19, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.905, Rules used = {4980, 4852, 266, 36, 29, 31, 199, 205, 4912, 6725, 571, 77, 4908, 2409, 2394, 2393, 2391, 444, 4910}

result too large to display

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^3),x]
```

```
[Out] (b*c*e)/(8*d^2*(c^2*d - e)*(d + e*x^2)) - (a + b*ArcTan[c*x])/(d^3*x) - (e*
x*(a + b*ArcTan[c*x]))/(4*d^2*(d + e*x^2)^2) - (7*e*x*(a + b*ArcTan[c*x]))/
(8*d^3*(d + e*x^2)) - (a*Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/d^(7/2) - (7*
Sqrt[e]*(a + b*ArcTan[c*x])*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(8*d^(7/2)) + (b*c
*Log[x])/d^3 - ((I/4)*b*Sqrt[e]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] - Sqrt[e]*x
))/(c*Sqrt[-d] - I*Sqrt[e])])/(-d)^(7/2) + ((I/4)*b*Sqrt[e]*Log[1 - I*c*x]*
Log[(c*(Sqrt[-d] - Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(7/2) - ((I/
4)*b*Sqrt[e]*Log[1 - I*c*x]*Log[(c*(Sqrt[-d] + Sqrt[e]*x))/(c*Sqrt[-d] - I*
```

```
Sqrt[e])])/(-d)^(7/2) + ((I/4)*b*Sqrt[e]*Log[1 + I*c*x]*Log[(c*(Sqrt[-d] +
Sqrt[e]*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(7/2) - (((7*I)/32)*b*c*Sqrt[e]
*Log[(Sqrt[e]*(1 - Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 -
 (I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(7/2)) + (((7*I)/32)*b*c*Sqrt[e]*Log
[-((Sqrt[e]*(1 + Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 -
(I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(7/2)) + (((7*I)/32)*b*c*Sqrt[e]*Log[
-((Sqrt[e]*(1 - Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] - Sqrt[e]))]*Log[1 + (
I*Sqrt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(7/2)) - (((7*I)/32)*b*c*Sqrt[e]*Log[(
Sqrt[e]*(1 + Sqrt[-c^2]*x))/(I*Sqrt[-c^2]*Sqrt[d] + Sqrt[e])]*Log[1 + (I*Sq
rt[e]*x)/Sqrt[d]])/(Sqrt[-c^2]*d^(7/2)) - (b*c*Log[1 + c^2*x^2])/(2*d^3) +
(b*c*(5*c^2*d - 3*e)*e*Log[1 + c^2*x^2])/(16*d^3*(c^2*d - e)^2) + (b*c*e*Lo
g[1 + c^2*x^2])/(4*d^3*(c^2*d - e)) - (b*c*(5*c^2*d - 3*e)*e*Log[d + e*x^2]
)/(16*d^3*(c^2*d - e)^2) - (b*c*e*Log[d + e*x^2])/(4*d^3*(c^2*d - e)) + ((I
/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*(I - c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d
)^(7/2) - ((I/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*(1 - I*c*x))/(I*c*Sqrt[-d] +
 Sqrt[e])])/(-d)^(7/2) - ((I/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e]*(1 + I*c*x))/
(I*c*Sqrt[-d] + Sqrt[e])])/(-d)^(7/2) + ((I/4)*b*Sqrt[e]*PolyLog[2, (Sqrt[e
]*(I + c*x))/(c*Sqrt[-d] + I*Sqrt[e])])/(-d)^(7/2) - (((7*I)/32)*b*c*Sqrt[e
]*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] - I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*S
qrt[e])])/(Sqrt[-c^2]*d^(7/2)) + (((7*I)/32)*b*c*Sqrt[e]*PolyLog[2, (Sqrt[-
c^2]*(Sqrt[d] - I*Sqrt[e]*x))/(Sqrt[-c^2]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2
]*d^(7/2)) - (((7*I)/32)*b*c*Sqrt[e]*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] + I*Sq
rt[e]*x))/(Sqrt[-c^2]*Sqrt[d] - I*Sqrt[e])])/(Sqrt[-c^2]*d^(7/2)) + (((7*I)
/32)*b*c*Sqrt[e]*PolyLog[2, (Sqrt[-c^2]*(Sqrt[d] + I*Sqrt[e]*x))/(Sqrt[-c^2
]*Sqrt[d] + I*Sqrt[e])])/(Sqrt[-c^2]*d^(7/2))
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 199

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b}, x] && IGtQ[n, 0] && LtQ[p, -1] && (Integer
Q[2*p] || (n == 2 && IntegerQ[4*p]) || (n == 2 && IntegerQ[3*p]) || Denomin
ator[p + 1/n] < Denominator[p])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 571

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2\left(d+ex^2\right)^3}\,dx = \int \left(\frac{a+b\tan^{-1}(cx)}{d^3x^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d\left(d+ex^2\right)^3} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^2\left(d+ex^2\right)^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)}{d^3\left(d+ex^2\right)}\right) dx$$

$$= \frac{\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d^3} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{d+ex^2}\,dx}{d^3} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx}{d^2} - \frac{e\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^3}\,dx}{d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)} - \frac{7\sqrt{e}\left(a+b\tan^{-1}(cx)\right.}{8d^{7/2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{7/2}} - \frac{7}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{7/2}} - \frac{7}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{7/2}} - \frac{7}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)} - \frac{a\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{d^{7/2}} - \frac{7}{}$$

$$= \frac{bce}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)}$$

$$= \frac{bce}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)}$$

$$= \frac{bce}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)}$$

$$= \frac{bce}{8d^2\left(c^2d-e\right)\left(d+ex^2\right)} - \frac{a+b\tan^{-1}(cx)}{d^3x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)}{4d^2\left(d+ex^2\right)^2} - \frac{7ex\left(a+b\tan^{-1}(cx)\right)}{8d^3\left(d+ex^2\right)}$$

Mathematica [A] time = 13.43, size = 2005, normalized size = 1.32

Result too large to show

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^3),x]
```

```
[Out] -(a/(d^3*x)) - (a*e*x)/(4*d^2*(d + e*x^2)^2) - (7*a*e*x)/(8*d^3*(d + e*x^2)
) - (15*a*Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/(8*d^(7/2)) + b*c^7*(-(ArcTa
n[c*x]/(c^7*d^3*x)) + Log[(c*x)/Sqrt[1 + c^2*x^2]]/(c^6*d^3) - (9*e*Log[1 -
 ((-(c^2*d) + e)*Cos[2*ArcTan[c*x]])/(c^2*d + e)])/(16*c^4*d^2*(c^2*d - e)^
2) + (7*e^2*Log[1 - ((-(c^2*d) + e)*Cos[2*ArcTan[c*x]])/(c^2*d + e)])/(16*c
^6*d^3*(c^2*d - e)^2) - (15*e*(4*ArcTan[c*x]*ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)
]*x)] + 2*ArcCos[(-(c^2*d) - e)/(c^2*d - e)]*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e
)]] - (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^
2*d*e)]])*Log[1 - ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c*Sqrt
[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))] + (-ArcC
os[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*L
og[1 - ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c*Sqrt[-(c^2*d*e)
]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))] + (ArcCos[(-(c^2*d)
 - e)/(c^2*d - e)] - (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(
c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sqrt[c^2*d - e]*
E^(I*ArcTan[c*x])*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] + (Arc
Cos[(-(c^2*d) - e)/(c^2*d - e)] + (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)
] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)]*E^(I*
ArcTan[c*x]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*
x]]])] + I*(PolyLog[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c
*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))] - P
olyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c*Sqrt[-(c^2*d
*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))])))/(32*c^4*d^2*(
c^2*d - e)*Sqrt[-(c^2*d*e)]) + (15*e^2*(4*ArcTan[c*x]*ArcTanh[(c*d)/(Sqrt[-
(c^2*d*e)]*x)] + 2*ArcCos[(-(c^2*d) - e)/(c^2*d - e)]*ArcTanh[(c*e*x)/Sqrt[
-(c^2*d*e)]] - (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcTanh[(c*e*x)/
Sqrt[-(c^2*d*e)]])*Log[1 - ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d -
 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))]
 + (-ArcCos[(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*
d*e)]])*Log[1 - ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c*Sqrt[-
(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))] + (ArcCos[
(-(c^2*d) - e)/(c^2*d - e)] - (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] +
ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sqrt[c^
2*d - e]*E^(I*ArcTan[c*x])*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]]
)] + (ArcCos[(-(c^2*d) - e)/(c^2*d - e)] + (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2
*d*e)]*x)] + ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*
e)]*E^(I*ArcTan[c*x]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*
ArcTan[c*x]]])] + I*(PolyLog[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(2*c^
2*d - 2*c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]
*x))] - PolyLog[2, ((c^2*d + e + (2*I)*Sqrt[-(c^2*d*e)])*(2*c^2*d - 2*c*Sqr
t[-(c^2*d*e)]*x))/((c^2*d - e)*(2*c^2*d + 2*c*Sqrt[-(c^2*d*e)]*x))])))/(32*
c^6*d^3*(c^2*d - e)*Sqrt[-(c^2*d*e)]) + (e^2*ArcTan[c*x]*Sin[2*ArcTan[c*x]]
)/(2*c^4*d^2*(c^2*d - e)*(c^2*d + e + c^2*d*Cos[2*ArcTan[c*x]] - e*Cos[2*Ar
cTan[c*x]])^2) + (-2*c^2*d*e^2 - 9*c^4*d^2*e*ArcTan[c*x]*Sin[2*ArcTan[c*x]]
 + 16*c^2*d*e^2*ArcTan[c*x]*Sin[2*ArcTan[c*x]] - 7*e^3*ArcTan[c*x]*Sin[2*Ar
cTan[c*x]])/(8*c^6*d^3*(c^2*d - e)^2*(c^2*d + e + c^2*d*Cos[2*ArcTan[c*x]]
- e*Cos[2*ArcTan[c*x]])))
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b\arctan(cx) + a}{e^3x^8 + 3\,de^2x^6 + 3\,d^2ex^4 + d^3x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^3,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)/(e^3*x^8 + 3*d*e^2*x^6 + 3*d^2*e*x^4 + d^3*x^2
), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^3,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 1.38, size = 6655, normalized size = 4.38

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^3,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{8}\,a\left(\frac{15\,e^{2}x^{4}+25\,dex^{2}+8\,d^{2}}{d^{3}e^{2}x^{5}+2\,d^{4}ex^{3}+d^{5}x}+\frac{15\,e\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d^{3}}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(e^{3}x^{8}+3\,de^{2}x^{6}+3\,d^{2}ex^{4}+d^{3}x^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^3,x, algorithm="maxima")
```

```
[Out] -1/8*a*((15*e^2*x^4 + 25*d*e*x^2 + 8*d^2)/(d^3*e^2*x^5 + 2*d^4*e*x^3 + d^5*
x) + 15*e*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d^3)) + 2*b*integrate(1/2*arctan
(c*x)/(e^3*x^8 + 3*d*e^2*x^6 + 3*d^2*e*x^4 + d^3*x^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^2\,{\left(e\,x^2+d\right)}^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^3),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(e*x**2+d)**3,x)
```

```
[Out] Timed out
```

3.1173 $\int x^3\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx$

Optimal. Leaf size=223

$$\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2}+\frac{b\left(c^2d-e\right)^{3/2}\left(2c^2d+3e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{15c^5e^2}-\frac{bx}{}$$

```
[Out] -1/20*b*x*(e*x^2+d)^(3/2)/c/e-1/3*d*(e*x^2+d)^(3/2)*(a+b*arctan(c*x))/e^2+1
/5*(e*x^2+d)^(5/2)*(a+b*arctan(c*x))/e^2+1/15*b*(c^2*d-e)^(3/2)*(2*c^2*d+3*
e)*arctan(x*(c^2*d-e)^(1/2)/(e*x^2+d)^(1/2))/c^5/e^2+1/120*b*(15*c^4*d^2+20
*c^2*d*e-24*e^2)*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/c^5/e^(3/2)-1/120*b*(c^
2*d-12*e)*x*(e*x^2+d)^(1/2)/c^3/e
```

Rubi [A] time = 0.37, antiderivative size = 223, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {266, 43, 4976, 12, 528, 523, 217, 206, 377, 203}

$$\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2}+\frac{b\left(15c^4d^2+20c^2de-24e^2\right)\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{120c^5e^{3/2}}+$$

Antiderivative was successfully verified.

```
[In] Int[x^3*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(c^2*d - 12*e)*x*Sqrt[d + e*x^2])/(120*c^3*e) - (b*x*(d + e*x^2)^(3/2))
/(20*c*e) - (d*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/(3*e^2) + ((d + e*x^2
)^(5/2)*(a + b*ArcTan[c*x]))/(5*e^2) + (b*(c^2*d - e)^(3/2)*(2*c^2*d + 3*e)
*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(15*c^5*e^2) + (b*(15*c^4*d^2
 + 20*c^2*d*e - 24*e^2)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(120*c^5*e^(3
/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^3\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx = -\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}-(bc$$

$$=-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}-\frac{(bc}{}$$

$$=-\frac{bx\left(d+ex^2\right)^{3/2}}{20ce}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\right.}{5e^2}$$

$$=-\frac{b\left(c^2d-12e\right)x\sqrt{d+ex^2}}{120c^3e}-\frac{bx\left(d+ex^2\right)^{3/2}}{20ce}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-}\right.}{3e^2}$$

$$=-\frac{b\left(c^2d-12e\right)x\sqrt{d+ex^2}}{120c^3e}-\frac{bx\left(d+ex^2\right)^{3/2}}{20ce}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-}\right.}{3e^2}$$

$$=-\frac{b\left(c^2d-12e\right)x\sqrt{d+ex^2}}{120c^3e}-\frac{bx\left(d+ex^2\right)^{3/2}}{20ce}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-}\right.}{3e^2}$$

$$=-\frac{b\left(c^2d-12e\right)x\sqrt{d+ex^2}}{120c^3e}-\frac{bx\left(d+ex^2\right)^{3/2}}{20ce}-\frac{d\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-}\right.}{3e^2}$$

Mathematica [C] time = 0.55, size = 391, normalized size = 1.75

$$\frac{-c^2\sqrt{d+ex^2}\left(8ac^3\left(2d^2-dex^2-3e^2x^4\right)+bex\left(c^2\left(7d+6ex^2\right)-12e\right)\right)-8bc^5\tan^{-1}(cx)\sqrt{d+ex^2}\left(2d^2-dex^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] (-(c^2*Sqrt[d + e*x^2]*(8*a*c^3*(2*d^2 - d*e*x^2 - 3*e^2*x^4) + b*e*x*(-12*
e + c^2*(7*d + 6*e*x^2)))) - 8*b*c^5*Sqrt[d + e*x^2]*(2*d^2 - d*e*x^2 - 3*e
^2*x^4)*ArcTan[c*x] - (4*I)*b*(c^2*d - e)^(3/2)*(2*c^2*d + 3*e)*Log[((-60*I
)*c^6*e^2*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(
5/2)*(2*c^2*d + 3*e)*(I + c*x))] + (4*I)*b*(c^2*d - e)^(3/2)*(2*c^2*d + 3*e
)*Log[((60*I)*c^6*e^2*(c*d + I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(
c^2*d - e)^(5/2)*(2*c^2*d + 3*e)*(-I + c*x))] + b*Sqrt[e]*(15*c^4*d^2 + 20*
c^2*d*e - 24*e^2)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(120*c^5*e^2)
```

fricas [A] time = 3.80, size = 1200, normalized size = 5.38

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] [-1/240*((15*b*c^4*d^2 + 20*b*c^2*d*e - 24*b*e^2)*sqrt(e)*log(-2*e*x^2 + 2*
sqrt(e*x^2 + d)*sqrt(e)*x - d) + 4*(2*b*c^4*d^2 + b*c^2*d*e - 3*b*e^2)*sqrt
(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)
*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/
(c^4*x^4 + 2*c^2*x^2 + 1)) - 2*(24*a*c^5*e^2*x^4 + 8*a*c^5*d*e*x^2 - 6*b*c^
4*e^2*x^3 - 16*a*c^5*d^2 - (7*b*c^4*d*e - 12*b*c^2*e^2)*x + 8*(3*b*c^5*e^2*
x^4 + b*c^5*d*e*x^2 - 2*b*c^5*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^5*e^2),
```

```
1/240*(8*(2*b*c^4*d^2 + b*c^2*d*e - 3*b*e^2)*sqrt(c^2*d - e)*arctan(1/2*sq
rt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3
+ (c^2*d^2 - d*e)*x)) - (15*b*c^4*d^2 + 20*b*c^2*d*e - 24*b*e^2)*sqrt(e)*lo
g(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) + 2*(24*a*c^5*e^2*x^4 + 8*a*c
^5*d*e*x^2 - 6*b*c^4*e^2*x^3 - 16*a*c^5*d^2 - (7*b*c^4*d*e - 12*b*c^2*e^2)*
x + 8*(3*b*c^5*e^2*x^4 + b*c^5*d*e*x^2 - 2*b*c^5*d^2)*arctan(c*x))*sqrt(e*x
^2 + d))/(c^5*e^2), -1/120*((15*b*c^4*d^2 + 20*b*c^2*d*e - 24*b*e^2)*sqrt(-
e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + 2*(2*b*c^4*d^2 + b*c^2*d*e - 3*b*e^
2)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 -
 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)
+ d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - (24*a*c^5*e^2*x^4 + 8*a*c^5*d*e*x^2 - 6
*b*c^4*e^2*x^3 - 16*a*c^5*d^2 - (7*b*c^4*d*e - 12*b*c^2*e^2)*x + 8*(3*b*c^5
*e^2*x^4 + b*c^5*d*e*x^2 - 2*b*c^5*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^5*
e^2), 1/120*(4*(2*b*c^4*d^2 + b*c^2*d*e - 3*b*e^2)*sqrt(c^2*d - e)*arctan(1
/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)
*x^3 + (c^2*d^2 - d*e)*x)) - (15*b*c^4*d^2 + 20*b*c^2*d*e - 24*b*e^2)*sqrt(
-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (24*a*c^5*e^2*x^4 + 8*a*c^5*d*e*x^
2 - 6*b*c^4*e^2*x^3 - 16*a*c^5*d^2 - (7*b*c^4*d*e - 12*b*c^2*e^2)*x + 8*(3*
b*c^5*e^2*x^4 + b*c^5*d*e*x^2 - 2*b*c^5*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/
(c^5*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 1.34, size = 0, normalized size = 0.00

$$\int x^3\sqrt{e\,x^2+d}\,\left(a+b\arctan\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
[Out] int(x^3*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{15}\left(\frac{3\left(ex^2+d\right)^{\frac{3}{2}}x^2}{e}-\frac{2\left(ex^2+d\right)^{\frac{3}{2}}d}{e^2}\right)a+b\int\sqrt{ex^2+d}\,x^3\arctan\left(cx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] 1/15*(3*(e*x^2 + d)^(3/2)*x^2/e - 2*(e*x^2 + d)^(3/2)*d/e^2)*a + b*integrat
e(sqrt(e*x^2 + d)*x^3*arctan(c*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\sqrt{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^(1/2),x)
```

```
[Out] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^3 (a + b \operatorname{atan}(cx)) \sqrt{d + ex^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**(1/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))*sqrt(d + e*x**2), x)
```

3.1174 $\int x^2\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx$

Optimal. Leaf size=97

$$b\text{Int}\left(x^2\tan^{-1}(cx)\sqrt{d+ex^2},x\right)-\frac{ad^2\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{8e^{3/2}}+\frac{adx\sqrt{d+ex^2}}{8e}+\frac{1}{4}ax^3\sqrt{d+ex^2}$$

```
[Out] -1/8*a*d^2*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(3/2)+1/8*a*d*x*(e*x^2+d)^(
1/2)/e+1/4*a*x^3*(e*x^2+d)^(1/2)+b*Unintegrable(x^2*arctan(c*x)*(e*x^2+d)^(
1/2),x)
```

Rubi [A] time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] (a*d*x*Sqrt[d + e*x^2])/(8*e) + (a*x^3*Sqrt[d + e*x^2])/4 - (a*d^2*ArcTanh[
(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(8*e^(3/2)) + b*Defer[Int][x^2*Sqrt[d + e*x^2
]*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^2\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx &= a\int x^2\sqrt{d+ex^2}\,dx+b\int x^2\sqrt{d+ex^2}\tan^{-1}(cx)\,dx\\ &= \frac{1}{4}ax^3\sqrt{d+ex^2}+b\int x^2\sqrt{d+ex^2}\tan^{-1}(cx)\,dx+\frac{1}{4}(ad)\int\frac{x^2}{\sqrt{d+ex^2}}\,dx\\ &= \frac{adx\sqrt{d+ex^2}}{8e}+\frac{1}{4}ax^3\sqrt{d+ex^2}+b\int x^2\sqrt{d+ex^2}\tan^{-1}(cx)\,dx-\frac{\left(ad^2\right)\int}{8}\\ &= \frac{adx\sqrt{d+ex^2}}{8e}+\frac{1}{4}ax^3\sqrt{d+ex^2}+b\int x^2\sqrt{d+ex^2}\tan^{-1}(cx)\,dx-\frac{\left(ad^2\right)\text{Su}}{}\\ &= \frac{adx\sqrt{d+ex^2}}{8e}+\frac{1}{4}ax^3\sqrt{d+ex^2}-\frac{ad^2\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{8e^{3/2}}+b\int x^2\sqrt{d+ex^2}\end{aligned}$$

Mathematica [A] time = 11.29, size = 0, normalized size = 0.00

$$\int x^2\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^2*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(bx^2\arctan(cx)+ax^2\right)\sqrt{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral((b*x^2*arctan(c*x) + a*x^2)*sqrt(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.13, size = 0, normalized size = 0.00

$$\int x^2 \sqrt{e\,x^2+d}\,\,(a+b\arctan(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
[Out] int(x^2*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\sqrt{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^(1/2),x)
[Out] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}\left(a+b\,\mathrm{atan}\left(cx\right)\right)\sqrt{d+ex^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**(1/2)*(a+b*atan(c*x)),x)
[Out] Integral(x**2*(a + b*atan(c*x))*sqrt(d + e*x**2), x)
```

3.1175 $\int x\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx$

Optimal. Leaf size=140

$$\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e}-\frac{b\left(c^2d-e\right)^{3/2}\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{3c^3e}-\frac{b\left(3c^2d-2e\right)\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{6c^3\sqrt{e}}-\frac{bx\sqrt{d+ex^2}}{6c}$$

```
[Out] 1/3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x))/e-1/3*b*(c^2*d-e)^(3/2)*arctan(x*(c^2
*d-e)^(1/2)/(e*x^2+d)^(1/2))/c^3/e-1/6*b*(3*c^2*d-2*e)*arctanh(x*e^(1/2)/(e
*x^2+d)^(1/2))/c^3/e^(1/2)-1/6*b*x*(e*x^2+d)^(1/2)/c
```

Rubi [A] time = 0.14, antiderivative size = 140, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.333, Rules used = {4974, 416, 523, 217, 206, 377, 203}

$$\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e}-\frac{b\left(c^2d-e\right)^{3/2}\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{3c^3e}-\frac{b\left(3c^2d-2e\right)\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{6c^3\sqrt{e}}-\frac{bx\sqrt{d+ex^2}}{6c}$$

Antiderivative was successfully verified.

```
[In] Int[x*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*x*Sqrt[d + e*x^2])/(6*c) + ((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/(3*e
) - (b*(c^2*d - e)^(3/2)*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(3*c^
3*e) - (b*(3*c^2*d - 2*e)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(6*c^3*Sqrt
[e])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 416

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(d*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1))/(b*(n*(p + q) + 1)),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
```

```
, b, c, d, n, p, q, x]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int x\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx = \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e} - \frac{(bc)\int \frac{\left(d+ex^2\right)^{3/2}}{1+c^2x^2}\,dx}{3e}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6c} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e} - \frac{b\int \frac{d\left(2c^2d-e\right)+\left(3c^2d-2e\right)ex^2}{\left(1+c^2x^2\right)\sqrt{d+ex^2}}}{6ce}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6c} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e} - \frac{\left(b\left(3c^2d-2e\right)\right)\int \frac{1}{\sqrt{d+ex}}}{6c^3}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6c} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e} - \frac{\left(b\left(3c^2d-2e\right)\right)\text{Subst}\Big(}{6c}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6c} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e} - \frac{b\left(c^2d-e\right)^{3/2}\tan^{-1}\Big(\frac{\sqrt{c}}{\sqrt{}}}{3c^3e}$$

Mathematica [C] time = 0.56, size = 279, normalized size = 1.99

$$\frac{c^2\sqrt{d+ex^2}\left(2ac\left(d+ex^2\right)-bex\right)+2bc^3\tan^{-1}(cx)\left(d+ex^2\right)^{3/2}+b\sqrt{e}\left(2e-3c^2d\right)\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)-ib}{6c^3e}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c^2*Sqrt[d + e*x^2]*(-(b*e*x) + 2*a*c*(d + e*x^2)) + 2*b*c^3*(d + e*x^2)^(
3/2)*ArcTan[c*x] - I*b*(c^2*d - e)^(3/2)*Log[(12*c^4*e*((-I)*c*d + e*x - I*
Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(5/2)*(-I + c*x))] + I*b*(
c^2*d - e)^(3/2)*Log[(12*c^4*e*(I*c*d + e*x + I*Sqrt[c^2*d - e]*Sqrt[d + e*
x^2]))/(b*(c^2*d - e)^(5/2)*(I + c*x))] + b*Sqrt[e]*(-3*c^2*d + 2*e)*Log[e*
x + Sqrt[e]*Sqrt[d + e*x^2]])/(6*c^3*e)
```

fricas [A] time = 1.10, size = 879, normalized size = 6.28

$$\left[-\frac{\left(3\,bc^2d-2\,be\right)\sqrt{e}\,\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)+\left(bc^2d-be\right)\sqrt{-c^2d+e}\,\log\left(\frac{\left(c^4d^2-8\,c^2de+8\,e^2\right)x^4-2\left(3\,c^2d^2\right.}{}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] [-1/12*((3*b*c^2*d - 2*b*e)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e
)*x - d) + (b*c^2*d - b*e)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e
^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 + 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2
*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 2*(2*a*c^3*e*x^
2 + 2*a*c^3*d - b*c^2*e*x + 2*(b*c^3*e*x^2 + b*c^3*d)*arctan(c*x))*sqrt(e*x
^2 + d))/(c^3*e), -1/12*(2*(b*c^2*d - b*e)*sqrt(c^2*d - e)*arctan(1/2*sqrt(
c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (
c^2*d^2 - d*e)*x)) + (3*b*c^2*d - 2*b*e)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^
2 + d)*sqrt(e)*x - d) - 2*(2*a*c^3*e*x^2 + 2*a*c^3*d - b*c^2*e*x + 2*(b*c^3
*e*x^2 + b*c^3*d)*arctan(c*x))*sqrt(e*x^2 + d))/(c^3*e), 1/12*(2*(3*b*c^2*d
 - 2*b*e)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - (b*c^2*d - b*e)*sqr
t(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e
)*x^2 + 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)
/(c^4*x^4 + 2*c^2*x^2 + 1)) + 2*(2*a*c^3*e*x^2 + 2*a*c^3*d - b*c^2*e*x + 2*
(b*c^3*e*x^2 + b*c^3*d)*arctan(c*x))*sqrt(e*x^2 + d))/(c^3*e), -1/6*((b*c^2
*d - b*e)*sqrt(c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d
)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) - (3*b*c^2*d -
 2*b*e)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - (2*a*c^3*e*x^2 + 2*a*
c^3*d - b*c^2*e*x + 2*(b*c^3*e*x^2 + b*c^3*d)*arctan(c*x))*sqrt(e*x^2 + d))
/(c^3*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.04, size = 0, normalized size = 0.00

$$\int x\sqrt{e\,x^{2}+d}\,\left(a+b\arctan\left(c x\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int(x*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d zero or nonzero?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\sqrt{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*x^2)^(1/2),x)
[Out] int(x*(a + b*atan(c*x))*(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x(a+b\operatorname{atan}(cx))\sqrt{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**(1/2)*(a+b*atan(c*x)),x)
[Out] Integral(x*(a + b*atan(c*x))*sqrt(d + e*x**2), x)
```

3.1176 $\int \sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right),x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
[Out] Defer[Int][Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]), x]
```

Rubi steps

$$\int \sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)\,dx=\int \sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)\,dx$$

Mathematica [A] time = 5.10, size = 0, normalized size = 0.00

$$\int \sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
[Out] Integrate[Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{ex^2+d}\,(b\arctan(cx)+a),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.38, size = 0, normalized size = 0.00

$$\int \sqrt{e\,x^2+d}\,\left(a+b\arctan(cx)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int (a + b\,\mathrm{atan}\,(c\,x))\,\sqrt{e\,x^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*x^2)^(1/2),x)
```

```
[Out] int((a + b*atan(c*x))*(d + e*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (a + b\,\mathrm{atan}\,(cx))\,\sqrt{d + ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral((a + b*atan(c*x))*sqrt(d + e*x**2), x)
```

3.1177 $\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=64

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\sqrt{d+ex^2}}{x},x\right)+a\sqrt{d+ex^2}+a\left(-\sqrt{d}\right)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)$$

```
[Out] -a*arctanh((e*x^2+d)^(1/2)/d^(1/2))*d^(1/2)+a*(e*x^2+d)^(1/2)+b*Unintegrabl
e(arctan(c*x)*(e*x^2+d)^(1/2)/x,x)
```

Rubi [A] time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] a*Sqrt[d + e*x^2] - a*Sqrt[d]*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]] + b*Defer[In
t][(Sqrt[d + e*x^2]*ArcTan[c*x])/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx &= a\int \frac{\sqrt{d+ex^2}}{x}\,dx+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{\sqrt{d+ex}}{x}\,dx,x,x^2\right)+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x}\,dx\\
&= a\sqrt{d+ex^2}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x}\,dx+\frac{1}{2}(ad)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,\right.\\
&= a\sqrt{d+ex^2}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x}\,dx+\frac{(ad)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+}\right.}{e}\\
&= a\sqrt{d+ex^2}-a\sqrt{d}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x}\,dx
\end{aligned}$$

Mathematica [A] time = 82.61, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x,x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.17, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^{2}+d}\,\left(a+b\arctan\left(c x\right)\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x,x)
[Out] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\left(\sqrt{d}\,\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-\sqrt{ex^{2}+d}\right)a+b\int \frac{\sqrt{ex^{2}+d}\,\arctan\left(cx\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x,x, algorithm="maxima")
[Out] -(sqrt(d)*arcsinh(d/(sqrt(d*e)*abs(x))) - sqrt(e*x^2 + d))*a + b*integrate(
sqrt(e*x^2 + d)*arctan(c*x)/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\sqrt{e\,x^2+d}}{x} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x,x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \operatorname{atan}{\left(cx \right)}\right) \sqrt{d + ex^{2}}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*atan(c*x))/x,x)
[Out] Integral((a + b*atan(c*x))*sqrt(d + e*x**2)/x, x)
```

3.1178 $\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=68

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\sqrt{d+ex^2}}{x^2},x\right)-\frac{a\sqrt{d+ex^2}}{x}+a\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)$$

```
[Out] a*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))*e^(1/2)-a*(e*x^2+d)^(1/2)/x+b*Unintegr
able(arctan(c*x)*(e*x^2+d)^(1/2)/x^2,x)
```

Rubi [A] time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] -((a*Sqrt[d + e*x^2])/x) + a*Sqrt[e]*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]] +
 b*Defer[Int][(Sqrt[d + e*x^2]*ArcTan[c*x])/x^2, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx &= a\int \frac{\sqrt{d+ex^2}}{x^2}\,dx+b\int \frac{\sqrt{d+ex^2}\,\tan^{-1}(cx)}{x^2}\,dx\\
&= -\frac{a\sqrt{d+ex^2}}{x}+b\int \frac{\sqrt{d+ex^2}\,\tan^{-1}(cx)}{x^2}\,dx+(ae)\int \frac{1}{\sqrt{d+ex^2}}\,dx\\
&= -\frac{a\sqrt{d+ex^2}}{x}+b\int \frac{\sqrt{d+ex^2}\,\tan^{-1}(cx)}{x^2}\,dx+(ae)\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{}}\right.\\
&= -\frac{a\sqrt{d+ex^2}}{x}+a\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)+b\int \frac{\sqrt{d+ex^2}\,\tan^{-1}(cx)}{x^2}\,dx
\end{aligned}$$

Mathematica [A] time = 8.95, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^2, x]
```

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^{2}+d}\,\left(a+b\arctan\left(c x\right)\right)}{x^{2}}d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^2,x)
[Out] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^2,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\left(\sqrt{e}\,\operatorname{arsinh}\left(\frac{ex}{\sqrt{de}}\right)-\frac{\sqrt{ex^{2}+d}}{x}\right)a+b\int\frac{\sqrt{ex^{2}+d}\,\arctan\left(cx\right)}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
[Out] (sqrt(e)*arcsinh(e*x/sqrt(d*e)) - sqrt(e*x^2 + d)/x)*a + b*integrate(sqrt(e
*x^2 + d)*arctan(c*x)/x^2, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\sqrt{e\,x^2+d}}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^2,x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\operatorname{atan}{\left(cx\right)}\right)\sqrt{d+ex^{2}}}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*atan(c*x))/x**2,x)
[Out] Integral((a + b*atan(c*x))*sqrt(d + e*x**2)/x**2, x)
```

3.1179 $\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=73

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\sqrt{d+ex^2}}{x^3},x\right)-\frac{a\sqrt{d+ex^2}}{2x^2}-\frac{ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2\sqrt{d}}$$

```
[Out] -1/2*a*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(1/2)-1/2*a*(e*x^2+d)^(1/2)/x^2
+b*Unintegrable(arctan(c*x)*(e*x^2+d)^(1/2)/x^3,x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] -(a*Sqrt[d + e*x^2])/(2*x^2) - (a*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(2*Sq
rt[d]) + b*Defer[Int][(Sqrt[d + e*x^2]*ArcTan[c*x])/x^3, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx &= a\int \frac{\sqrt{d+ex^2}}{x^3}\,dx+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^3}\,dx\\
&=\frac{1}{2}a\,\text{Subst}\left(\int \frac{\sqrt{d+ex}}{x^2}\,dx,x,x^2\right)+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^3}\,dx\\
&=-\frac{a\sqrt{d+ex^2}}{2x^2}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^3}\,dx+\frac{1}{4}(ae)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,\right.\\
&=-\frac{a\sqrt{d+ex^2}}{2x^2}+\frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)+b\int \frac{\sqrt{d+ex^2}\tan^{-}}{x^3}\\
&=-\frac{a\sqrt{d+ex^2}}{2x^2}-\frac{ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2\sqrt{d}}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^3}\,dx
\end{aligned}$$

Mathematica [A] time = 54.93, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^3, x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^{2}+d}\,\left(a+b\arctan\left(c x\right)\right)}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^3,x)
[Out] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(\frac{e\,\mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{\sqrt{d}}-\frac{\sqrt{ex^{2}+d}\,e}{d}+\frac{\left(ex^{2}+d\right)^{\frac{3}{2}}}{dx^{2}}\right)a+b\int \frac{\sqrt{ex^{2}+d}\,\arctan\left(cx\right)}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
[Out] -1/2*(e*arcsinh(d/(sqrt(d*e)*abs(x)))/sqrt(d) - sqrt(e*x^2 + d)*e/d + (e*x^
2 + d)^(3/2)/(d*x^2))*a + b*integrate(sqrt(e*x^2 + d)*arctan(c*x)/x^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\sqrt{e\,x^{2}+d}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^3,x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(cx\right)\right)\sqrt{d+ex^{2}}}{x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*atan(c*x))/x**3,x)
[Out] Integral((a + b*atan(c*x))*sqrt(d + e*x**2)/x**3, x)
```

3.1180 $\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=137

$$-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}-\frac{b\left(c^2d-e\right)^{3/2}\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d}+\frac{bc\left(2c^2d-3e\right)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{6\sqrt{d}}-\frac{bc\sqrt{d+ex^2}}{6x^2}$$

```
[Out] -1/3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x))/d/x^3-1/3*b*(c^2*d-e)^(3/2)*arctanh(
c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d+1/6*b*c*(2*c^2*d-3*e)*arctanh((e*x^2+d
)^(1/2)/d^(1/2))/d^(1/2)-1/6*b*c*(e*x^2+d)^(1/2)/x^2
```

Rubi [A] time = 0.28, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {264, 4976, 12, 446, 98, 156, 63, 208}

$$-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}-\frac{b\left(c^2d-e\right)^{3/2}\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d}+\frac{bc\left(2c^2d-3e\right)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{6\sqrt{d}}-\frac{bc\sqrt{d+ex^2}}{6x^2}$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -(b*c*Sqrt[d + e*x^2])/(6*x^2) - ((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/(3
*d*x^3) + (b*c*(2*c^2*d - 3*e)*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(6*Sqrt[d]
) - (b*(c^2*d - e)^(3/2)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(3*d
)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 98

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_
))^(p_.), x_Symbol] :> Simp[((b*c - a*d)*(a + b*x)^(m + 1)*(c + d*x)^(n - 1
)*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] + Dist[1/(b*(b*e - a*f)*(m
 + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 2)*(e + f*x)^p*Simp[a*d*(d*e*(
n - 1) + c*f*(p + 1)) + b*c*(d*e*(m - n + 2) - c*f*(m + p + 2)) + d*(a*d*f*
(n + p) + b*(d*e*(m + 1) - c*f*(m + n + p + 1)))*x, x], x], x] /; FreeQ[{a,
 b, c, d, e, f, p}, x] && LtQ[m, -1] && GtQ[n, 1] && (IntegersQ[2*m, 2*n, 2
*p] || IntegersQ[m, n + p] || IntegersQ[p, m + n])
```

Rule 156

```
Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*
((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e +
f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c
```

```
 + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx = -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3} - (bc)\int \frac{\left(d+ex^2\right)^{3/2}}{3x^3\left(-d-c^2dx^2\right)}\,dx$$

$$= -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3} - \frac{1}{3}(bc)\int \frac{\left(d+ex^2\right)^{3/2}}{x^3\left(-d-c^2dx^2\right)}\,dx$$

$$= -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3} - \frac{1}{6}(bc)\,\text{Subst}\left(\int \frac{(d+ex)^{3/2}}{x^2\left(-d-c^2dx\right)}\,dx, x, x^2\right.$$

$$= -\frac{bc\sqrt{d+ex^2}}{6x^2} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3} - \frac{(bc)\,\text{Subst}\left(\int \frac{-\frac{1}{2}d^2\left(2c^2d-3\right.}{x\left(-d-c^2\right.}\right.}{6d}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6x^2} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3} - \frac{1}{12}\left(bc\left(2c^2d-3e\right)\right)\text{Subs}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6x^2} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3} - \frac{\left(bc\left(2c^2d-3e\right)\right)\text{Subst}\left(\right.}{6}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6x^2} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3} + \frac{bc\left(2c^2d-3e\right)\tanh^{-1}\left(\right.}{6\sqrt{d}}$$

Mathematica [C] time = 0.68, size = 288, normalized size = 2.10

$$-\frac{\sqrt{d+ex^2}\left(2a\left(d+ex^2\right)+bcdx\right)+bc\sqrt{d}\,x^3\log(x)\left(2c^2d-3e\right)-bc\sqrt{d}\,x^3\left(2c^2d-3e\right)\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)+b\cdots}{\cdots}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -1/6*(Sqrt[d + e*x^2]*(b*c*d*x + 2*a*(d + e*x^2)) + 2*b*(d + e*x^2)^(3/2)*A
rcTan[c*x] + b*c*Sqrt[d]*(2*c^2*d - 3*e)*x^3*Log[x] - b*c*Sqrt[d]*(2*c^2*d
- 3*e)*x^3*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] + b*(c^2*d - e)^(3/2)*x^3*Log[(
12*c*d*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(5/2
)*(I + c*x))] + b*(c^2*d - e)^(3/2)*x^3*Log[(12*c*d*(c*d + I*e*x + Sqrt[c^2
*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(5/2)*(-I + c*x))])/(d*x^3)
```

fricas [A] time = 0.61, size = 858, normalized size = 6.26

$$\left[-\frac{\left(bc^2d-be\right)\sqrt{c^2d-e}\,x^3\log\left(\frac{c^4e^2x^4+8\,c^4d^2-8\,c^2de+2\left(4\,c^4de-3\,c^2e^2\right)x^2+4\left(c^3ex^2+2\,c^3d-ce\right)\sqrt{c^2d-e}\,\sqrt{ex^2+d}+e^2}{c^4x^4+2\,c^2x^2+1}\right)+\left(2\,bc^3d-3\,bce\right)\cdots}{12\,dx^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] [-1/12*((b*c^2*d - b*e)*sqrt(c^2*d - e)*x^3*log((c^4*e^2*x^4 + 8*c^4*d^2 -
8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*s
qrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + (2*b*c^3
*d - 3*b*c*e)*sqrt(d)*x^3*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^
2) + 2*(b*c*d*x + 2*a*e*x^2 + 2*a*d + 2*(b*e*x^2 + b*d)*arctan(c*x))*sqrt(e
*x^2 + d))/(d*x^3), -1/12*(2*(b*c^2*d - b*e)*sqrt(-c^2*d + e)*x^3*arctan(-1
/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*
d*e + (c^3*d*e - c*e^2)*x^2)) + (2*b*c^3*d - 3*b*c*e)*sqrt(d)*x^3*log(-(e*x
^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*(b*c*d*x + 2*a*e*x^2 + 2*a*d
 + 2*(b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d))/(d*x^3), -1/12*(2*(2*b*c
^3*d - 3*b*c*e)*sqrt(-d)*x^3*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (b*c^2*d -
b*e)*sqrt(c^2*d - e)*x^3*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^
4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt
(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 2*(b*c*d*x + 2*a*e*x^2 + 2*
a*d + 2*(b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d))/(d*x^3), -1/6*((b*c^2
*d - b*e)*sqrt(-c^2*d + e)*x^3*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-
c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) + (2*
b*c^3*d - 3*b*c*e)*sqrt(-d)*x^3*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (b*c*d*x
 + 2*a*e*x^2 + 2*a*d + 2*(b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d))/(d*x
^3)]
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.20, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^2+d}\;\left(a+b\arctan\left(cx\right)\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^4,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))\,\sqrt{e\,x^2 + d}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^4,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^4, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))\,\sqrt{d + ex^2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Integral((a + b*atan(c*x))*sqrt(d + e*x**2)/x**4, x)
```

3.1181 $\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=98

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\sqrt{d+ex^2}}{x^5},x\right)+\frac{ae^2\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{8d^{3/2}}-\frac{ae\sqrt{d+ex^2}}{8dx^2}-\frac{a\sqrt{d+ex^2}}{4x^4}$$

```
[Out] 1/8*a*e^2*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)-1/4*a*(e*x^2+d)^(1/2)/x^
4-1/8*a*e*(e*x^2+d)^(1/2)/d/x^2+b*Unintegrable(arctan(c*x)*(e*x^2+d)^(1/2)/
x^5,x)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] -(a*Sqrt[d + e*x^2])/(4*x^4) - (a*e*Sqrt[d + e*x^2])/(8*d*x^2) + (a*e^2*Arc
Tanh[Sqrt[d + e*x^2]/Sqrt[d]])/(8*d^(3/2)) + b*Defer[Int][(Sqrt[d + e*x^2]*
ArcTan[c*x])/x^5, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx &= a\int \frac{\sqrt{d+ex^2}}{x^5}\,dx+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^5}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{\sqrt{d+ex}}{x^3}\,dx,x,x^2\right)+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^5}\,dx\\
&= -\frac{a\sqrt{d+ex^2}}{4x^4}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^5}\,dx+\frac{1}{8}(ae)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{d+ex}}\,dx\right.\\
&= -\frac{a\sqrt{d+ex^2}}{4x^4}-\frac{ae\sqrt{d+ex^2}}{8dx^2}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^5}\,dx-\frac{\left(ae^2\right)\text{Subst}\left(\int\right.}{16}\\
&= -\frac{a\sqrt{d+ex^2}}{4x^4}-\frac{ae\sqrt{d+ex^2}}{8dx^2}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(cx)}{x^5}\,dx-\frac{(ae)\,\text{Subst}\left(\int -\right.}{}\\
&= -\frac{a\sqrt{d+ex^2}}{4x^4}-\frac{ae\sqrt{d+ex^2}}{8dx^2}+\frac{ae^2\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{8d^{3/2}}+b\int \frac{\sqrt{d+ex^2}\tan^{-1}(c}{x^5}
\end{aligned}$$

Mathematica [A] time = 58.00, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^5, x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/x^5, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^2+d}\;\;(a+b\arctan(cx))}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^5,x)
[Out] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^5,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}\left(\frac{e^2\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{3}{2}}}-\frac{\sqrt{ex^2+d}\,e^2}{d^2}+\frac{\left(ex^2+d\right)^{\frac{3}{2}}e}{d^2x^2}-\frac{2\left(ex^2+d\right)^{\frac{3}{2}}}{dx^4}\right)a+b\int\frac{\sqrt{ex^2+d}\,\arctan(cx)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
[Out] 1/8*(e^2*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(3/2) - sqrt(e*x^2 + d)*e^2/d^2 +
(e*x^2 + d)^(3/2)*e/(d^2*x^2) - 2*(e*x^2 + d)^(3/2)/(d*x^4))*a + b*integrat
e(sqrt(e*x^2 + d)*arctan(c*x)/x^5, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))\;\sqrt{e\,x^2+d}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^5,x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^5, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{atan}(cx))\sqrt{d+ex^2}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*atan(c*x))/x**5,x)
[Out] Integral((a + b*atan(c*x))*sqrt(d + e*x**2)/x**5, x)
```

3.1182 $\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx$

Optimal. Leaf size=224

$$\frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{15d^2x^3}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5}+\frac{b\left(3c^2d+2e\right)\left(c^2d-e\right)^{3/2}\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{15d^2}+\frac{bc}{}$$

```
[Out] -1/5*(e*x^2+d)^(3/2)*(a+b*arctan(c*x))/d/x^5+2/15*e*(e*x^2+d)^(3/2)*(a+b*ar
ctan(c*x))/d^2/x^3+1/30*b*c*(3*c^2*d-e)*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))/
d^(3/2)+1/40*b*c*e^2*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)-1/15*b*c*(c^2
*d-e)*(3*c^2*d+2*e)*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)+1/15*b*(c^2*d-
e)^(3/2)*(3*c^2*d+2*e)*arctanh(c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d^2-1/20*
b*c*(e*x^2+d)^(1/2)/x^4+1/30*b*c*(3*c^2*d-e)*(e*x^2+d)^(1/2)/d/x^2-1/40*b*c
*e*(e*x^2+d)^(1/2)/d/x^2
```

Rubi [A] time = 0.35, antiderivative size = 224, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = $\{271, 264, 4976, 12, 573, 149, 156, 63, 208\}$

$$\frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{15d^2x^3}-\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5}-\frac{bc\left(24c^4d^2-20c^2de-15e^2\right)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{120d^{3/2}}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] (b*c*(12*c^2*d - e)*Sqrt[d + e*x^2])/(120*d*x^2) - (b*c*(d + e*x^2)^(3/2))/
(20*d*x^4) - ((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/(5*d*x^5) + (2*e*(d +
e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/(15*d^2*x^3) - (b*c*(24*c^4*d^2 - 20*c^2*
d*e - 15*e^2)*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(120*d^(3/2)) + (b*(c^2*d -
 e)^(3/2)*(3*c^2*d + 2*e)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(15
*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 149

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_)
)^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[((b*g - a*h)*(a + b*x)^(m +
1)*(c + d*x)^n*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] - Dist[1/(b*(
b*e - a*f)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 1)*(e + f*x)^p*Si
mp[b*c*(f*g - e*h)*(m + 1) + (b*g - a*h)*(d*e*n + c*f*(p + 1)) + d*(b*(f*g
- e*h)*(m + 1) + f*(b*g - a*h)*(n + p + 1))*x, x], x], x] /; FreeQ[{a, b, c
, d, e, f, g, h, p}, x] && LtQ[m, -1] && GtQ[n, 0] && IntegerQ[m]
```

Rule 156

```
Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*
((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e +
f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c
 + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 573

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simpl
ify[(m + 1)/n] - 1)*(a + b*x)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /;
 FreeQ[{a, b, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[Simplify[(m + 1)/n
]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx = -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{15d^2x^3} - (bc)\int$$

$$= -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{15d^2x^3} - \frac{(bc)\int}{}$$

$$= -\frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{15d^2x^3} - \frac{(bc)\,\mathrm{Su}}{}$$

$$= -\frac{bc\left(d+ex^2\right)^{3/2}}{20dx^4} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} + \frac{2e\left(d+ex^2\right)^{3/2}\left(a+b\tan\right.}{15d^2x^3}$$

$$= \frac{bc\left(12c^2d-e\right)\sqrt{d+ex^2}}{120dx^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20dx^4} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} +$$

$$= \frac{bc\left(12c^2d-e\right)\sqrt{d+ex^2}}{120dx^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20dx^4} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} +$$

$$= \frac{bc\left(12c^2d-e\right)\sqrt{d+ex^2}}{120dx^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20dx^4} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} +$$

$$= \frac{bc\left(12c^2d-e\right)\sqrt{d+ex^2}}{120dx^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20dx^4} - \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} +$$

Mathematica [C] time = 0.55, size = 413, normalized size = 1.84

$$\frac{-\sqrt{d+ex^2}\left(8a\left(3d^2+dex^2-2e^2x^4\right)+bcdx\left(d\left(6-12c^2x^2\right)+7ex^2\right)\right)+4bx^5\left(c^2d-e\right)^{3/2}\left(3c^2d+2e\right)\log\left(-\frac{60cd^2(\cdots}{b(cx+\cdots}\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] (-(Sqrt[d + e*x^2]*(8*a*(3*d^2 + d*e*x^2 - 2*e^2*x^4) + b*c*d*x*(7*e*x^2 +
d*(6 - 12*c^2*x^2)))) - 8*b*Sqrt[d + e*x^2]*(3*d^2 + d*e*x^2 - 2*e^2*x^4)*A
rcTan[c*x] + b*c*Sqrt[d]*(24*c^4*d^2 - 20*c^2*d*e - 15*e^2)*x^5*Log[x] - b*
c*Sqrt[d]*(24*c^4*d^2 - 20*c^2*d*e - 15*e^2)*x^5*Log[d + Sqrt[d]*Sqrt[d + e
*x^2]] + 4*b*(c^2*d - e)^(3/2)*(3*c^2*d + 2*e)*x^5*Log[(-60*c*d^2*(c*d - I*
e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(5/2)*(3*c^2*d + 2*e
)*(I + c*x))] + 4*b*(c^2*d - e)^(3/2)*(3*c^2*d + 2*e)*x^5*Log[(-60*c*d^2*(c
*d + I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(5/2)*(3*c^2*
d + 2*e)*(-I + c*x))])/(120*d^2*x^5)
```

fricas [A] time = 1.09, size = 1156, normalized size = 5.16

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [-1/240*(4*(3*b*c^4*d^2 - b*c^2*d*e - 2*b*e^2)*sqrt(c^2*d - e)*x^5*log((c^4
*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 - 4*(c^3*e
```

```
*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c
^2*x^2 + 1)) + (24*b*c^5*d^2 - 20*b*c^3*d*e - 15*b*c*e^2)*sqrt(d)*x^5*log(-
(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) - 2*(16*a*e^2*x^4 - 6*b*c*d^
2*x - 8*a*d*e*x^2 + (12*b*c^3*d^2 - 7*b*c*d*e)*x^3 - 24*a*d^2 + 8*(2*b*e^2*
x^4 - b*d*e*x^2 - 3*b*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(d^2*x^5), 1/240*(
8*(3*b*c^4*d^2 - b*c^2*d*e - 2*b*e^2)*sqrt(-c^2*d + e)*x^5*arctan(-1/2*(c^2
*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (
c^3*d*e - c*e^2)*x^2)) - (24*b*c^5*d^2 - 20*b*c^3*d*e - 15*b*c*e^2)*sqrt(d)
*x^5*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*(16*a*e^2*x^4
- 6*b*c*d^2*x - 8*a*d*e*x^2 + (12*b*c^3*d^2 - 7*b*c*d*e)*x^3 - 24*a*d^2 + 8
*(2*b*e^2*x^4 - b*d*e*x^2 - 3*b*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(d^2*x^5
), 1/120*((24*b*c^5*d^2 - 20*b*c^3*d*e - 15*b*c*e^2)*sqrt(-d)*x^5*arctan(sq
rt(-d)/sqrt(e*x^2 + d)) - 2*(3*b*c^4*d^2 - b*c^2*d*e - 2*b*e^2)*sqrt(c^2*d
- e)*x^5*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^
2)*x^2 - 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^
2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + (16*a*e^2*x^4 - 6*b*c*d^2*x - 8*a*d*e*x^2 +
 (12*b*c^3*d^2 - 7*b*c*d*e)*x^3 - 24*a*d^2 + 8*(2*b*e^2*x^4 - b*d*e*x^2 - 3
*b*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(d^2*x^5), 1/120*(4*(3*b*c^4*d^2 - b*
c^2*d*e - 2*b*e^2)*sqrt(-c^2*d + e)*x^5*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d -
e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^
2)) + (24*b*c^5*d^2 - 20*b*c^3*d*e - 15*b*c*e^2)*sqrt(-d)*x^5*arctan(sqrt(-
d)/sqrt(e*x^2 + d)) + (16*a*e^2*x^4 - 6*b*c*d^2*x - 8*a*d*e*x^2 + (12*b*c^3
*d^2 - 7*b*c*d*e)*x^3 - 24*a*d^2 + 8*(2*b*e^2*x^4 - b*d*e*x^2 - 3*b*d^2)*ar
ctan(c*x))*sqrt(e*x^2 + d))/(d^2*x^5)]
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
[Out] Timed out
```

maple [F] time = 1.23, size = 0, normalized size = 0.00

$$\int \frac{\sqrt{e\,x^{2}+d}\;\left(a +b \arctan \left(c x \right)\right)}{x^{6}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^6,x)
[Out] int((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^6,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{15}\,a\left(\frac{2\left(ex^{2}+d\right)^{\frac{3}{2}}e}{d^{2}x^{3}}-\frac{3\left(ex^{2}+d\right)^{\frac{3}{2}}}{dx^{5}}\right)+b\int \frac{\sqrt{ex^{2}+d}\,\arctan\left(cx\right)}{x^{6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(1/2)*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
[Out] 1/15*a*(2*(e*x^2 + d)^(3/2)*e/(d^2*x^3) - 3*(e*x^2 + d)^(3/2)/(d*x^5)) + b*
integrate(sqrt(e*x^2 + d)*arctan(c*x)/x^6, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\sqrt{e\,x^2+d}}{x^6} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^6,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(1/2))/x^6, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\operatorname{atan}(cx))\sqrt{d + ex^2}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(1/2)*(a+b*atan(c*x))/x**6,x)
```

```
[Out] Integral((a + b*atan(c*x))*sqrt(d + e*x**2)/x**6, x)
```

3.1183 $\int x^3 \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=279

$$\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2}-\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}+\frac{b\left(c^2d-e\right)^{5/2}\left(2c^2d+5e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{35c^7e^2}-\frac{bx}{}$$

```
[Out] -1/840*b*(13*c^2*d-30*e)*x*(e*x^2+d)^(3/2)/c^3/e-1/42*b*x*(e*x^2+d)^(5/2)/c
/e-1/5*d*(e*x^2+d)^(5/2)*(a+b*arctan(c*x))/e^2+1/7*(e*x^2+d)^(7/2)*(a+b*arc
tan(c*x))/e^2+1/35*b*(c^2*d-e)^(5/2)*(2*c^2*d+5*e)*arctan(x*(c^2*d-e)^(1/2)
/(e*x^2+d)^(1/2))/c^7/e^2+1/560*b*(35*c^6*d^3+70*c^4*d^2*e-168*c^2*d*e^2+80
*e^3)*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/c^7/e^(3/2)+1/560*b*(3*c^4*d^2+54*
c^2*d*e-40*e^2)*x*(e*x^2+d)^(1/2)/c^5/e
```

Rubi [A] time = 0.46, antiderivative size = 279, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {266, 43, 4976, 12, 528, 523, 217, 206, 377, 203}

$$\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2}-\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}+\frac{bx\left(3c^4d^2+54c^2de-40e^2\right)\sqrt{d+ex^2}}{560c^5e}+\frac{b\left(70c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (b*(3*c^4*d^2 + 54*c^2*d*e - 40*e^2)*x*Sqrt[d + e*x^2])/(560*c^5*e) - (b*(1
3*c^2*d - 30*e)*x*(d + e*x^2)^(3/2))/(840*c^3*e) - (b*x*(d + e*x^2)^(5/2))/
(42*c*e) - (d*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/(5*e^2) + ((d + e*x^2)
^(7/2)*(a + b*ArcTan[c*x]))/(7*e^2) + (b*(c^2*d - e)^(5/2)*(2*c^2*d + 5*e)*
ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(35*c^7*e^2) + (b*(35*c^6*d^3
+ 70*c^4*d^2*e - 168*c^2*d*e^2 + 80*e^3)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2
]])/(560*c^7*e^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^3\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)\,dx = -\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2}-($$

$$= -\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2}-$$

$$= -\frac{bx\left(d+ex^2\right)^{5/2}}{42ce}-\frac{d\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e^2}+\frac{\left(d+ex^2\right)^{7/2}(a}{7e}$$

$$= -\frac{b\left(13c^2d-30e\right)x\left(d+ex^2\right)^{3/2}}{840c^3e}-\frac{bx\left(d+ex^2\right)^{5/2}}{42ce}-\frac{d\left(d+ex^2\right)^{5/2}(a}{5e^2}$$

$$= \frac{b\left(3c^4d^2+54c^2de-40e^2\right)x\sqrt{d+ex^2}}{560c^5e}-\frac{b\left(13c^2d-30e\right)x\left(d+ex^2\right)^{3/2}}{840c^3e}$$

$$= \frac{b\left(3c^4d^2+54c^2de-40e^2\right)x\sqrt{d+ex^2}}{560c^5e}-\frac{b\left(13c^2d-30e\right)x\left(d+ex^2\right)^{3/2}}{840c^3e}$$

$$= \frac{b\left(3c^4d^2+54c^2de-40e^2\right)x\sqrt{d+ex^2}}{560c^5e}-\frac{b\left(13c^2d-30e\right)x\left(d+ex^2\right)^{3/2}}{840c^3e}$$

$$= \frac{b\left(3c^4d^2+54c^2de-40e^2\right)x\sqrt{d+ex^2}}{560c^5e}-\frac{b\left(13c^2d-30e\right)x\left(d+ex^2\right)^{3/2}}{840c^3e}$$

Mathematica [C] time = 0.71, size = 418, normalized size = 1.50

$$-\frac{c^2\sqrt{d+ex^2}\left(48ac^5\left(2d-5ex^2\right)\left(d+ex^2\right)^2+bex\left(c^4\left(57d^2+106dex^2+40e^2x^4\right)-6c^2e\left(37d+10ex^2\right)+120e^2\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -1/1680*(c^2*Sqrt[d + e*x^2]*(48*a*c^5*(2*d - 5*e*x^2)*(d + e*x^2)^2 + b*e*
x*(120*e^2 - 6*c^2*e*(37*d + 10*e*x^2) + c^4*(57*d^2 + 106*d*e*x^2 + 40*e^2
*x^4))) + 48*b*c^7*(2*d - 5*e*x^2)*(d + e*x^2)^(5/2)*ArcTan[c*x] + (24*I)*b
*(c^2*d - e)^(5/2)*(2*c^2*d + 5*e)*Log[((-140*I)*c^8*e^2*(c*d - I*e*x + Sqr
t[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(7/2)*(2*c^2*d + 5*e)*(I + c*
x))] - (24*I)*b*(c^2*d - e)^(5/2)*(2*c^2*d + 5*e)*Log[((140*I)*c^8*e^2*(c*d
 + I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(7/2)*(2*c^2*d
+ 5*e)*(-I + c*x))] - 3*b*Sqrt[e]*(35*c^6*d^3 + 70*c^4*d^2*e - 168*c^2*d*e^
2 + 80*e^3)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(c^7*e^2)
```

fricas [A] time = 14.79, size = 1566, normalized size = 5.61

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] [1/3360*(3*(35*b*c^6*d^3 + 70*b*c^4*d^2*e - 168*b*c^2*d*e^2 + 80*b*e^3)*sqr
t(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) + 24*(2*b*c^6*d^3 + b*
c^4*d^2*e - 8*b*c^2*d*e^2 + 5*b*e^3)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2
```

```
*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 + 4*((c^2*d - 2*e)*x^3 - d*x)
*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 2*(24
0*a*c^7*e^3*x^6 + 384*a*c^7*d*e^2*x^4 - 40*b*c^6*e^3*x^5 + 48*a*c^7*d^2*e*x
^2 - 96*a*c^7*d^3 - 2*(53*b*c^6*d*e^2 - 30*b*c^4*e^3)*x^3 - 3*(19*b*c^6*d^2
*e - 74*b*c^4*d*e^2 + 40*b*c^2*e^3)*x + 48*(5*b*c^7*e^3*x^6 + 8*b*c^7*d*e^2
*x^4 + b*c^7*d^2*e*x^2 - 2*b*c^7*d^3)*arctan(c*x))*sqrt(e*x^2 + d))/(c^7*e^
2), 1/3360*(48*(2*b*c^6*d^3 + b*c^4*d^2*e - 8*b*c^2*d*e^2 + 5*b*e^3)*sqrt(c
^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d
)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) + 3*(35*b*c^6*d^3 + 70*b*c^4*d
^2*e - 168*b*c^2*d*e^2 + 80*b*e^3)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)
*sqrt(e)*x - d) + 2*(240*a*c^7*e^3*x^6 + 384*a*c^7*d*e^2*x^4 - 40*b*c^6*e^3
*x^5 + 48*a*c^7*d^2*e*x^2 - 96*a*c^7*d^3 - 2*(53*b*c^6*d*e^2 - 30*b*c^4*e^3
)*x^3 - 3*(19*b*c^6*d^2*e - 74*b*c^4*d*e^2 + 40*b*c^2*e^3)*x + 48*(5*b*c^7*
e^3*x^6 + 8*b*c^7*d*e^2*x^4 + b*c^7*d^2*e*x^2 - 2*b*c^7*d^3)*arctan(c*x))*s
qrt(e*x^2 + d))/(c^7*e^2), -1/1680*(3*(35*b*c^6*d^3 + 70*b*c^4*d^2*e - 168*
b*c^2*d*e^2 + 80*b*e^3)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - 12*(2
*b*c^6*d^3 + b*c^4*d^2*e - 8*b*c^2*d*e^2 + 5*b*e^3)*sqrt(-c^2*d + e)*log(((
c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 + 4*((c^2*d -
2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^
2 + 1)) - (240*a*c^7*e^3*x^6 + 384*a*c^7*d*e^2*x^4 - 40*b*c^6*e^3*x^5 + 48*
a*c^7*d^2*e*x^2 - 96*a*c^7*d^3 - 2*(53*b*c^6*d*e^2 - 30*b*c^4*e^3)*x^3 - 3*
(19*b*c^6*d^2*e - 74*b*c^4*d*e^2 + 40*b*c^2*e^3)*x + 48*(5*b*c^7*e^3*x^6 +
8*b*c^7*d*e^2*x^4 + b*c^7*d^2*e*x^2 - 2*b*c^7*d^3)*arctan(c*x))*sqrt(e*x^2
+ d))/(c^7*e^2), 1/1680*(24*(2*b*c^6*d^3 + b*c^4*d^2*e - 8*b*c^2*d*e^2 + 5*
b*e^3)*sqrt(c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*s
qrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) - 3*(35*b*c^6*d^3
 + 70*b*c^4*d^2*e - 168*b*c^2*d*e^2 + 80*b*e^3)*sqrt(-e)*arctan(sqrt(-e)*x/
sqrt(e*x^2 + d)) + (240*a*c^7*e^3*x^6 + 384*a*c^7*d*e^2*x^4 - 40*b*c^6*e^3*
x^5 + 48*a*c^7*d^2*e*x^2 - 96*a*c^7*d^3 - 2*(53*b*c^6*d*e^2 - 30*b*c^4*e^3)
*x^3 - 3*(19*b*c^6*d^2*e - 74*b*c^4*d*e^2 + 40*b*c^2*e^3)*x + 48*(5*b*c^7*e
^3*x^6 + 8*b*c^7*d*e^2*x^4 + b*c^7*d^2*e*x^2 - 2*b*c^7*d^3)*arctan(c*x))*sq
rt(e*x^2 + d))/(c^7*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.11, size = 0, normalized size = 0.00

$$\int x^{3} \left(e\,x^{2}+d\right)^{\frac{3}{2}} \left(a+b\arctan\left(c x\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{35}\left(\frac{5\left(ex^2+d\right)^{\frac{5}{2}}x^2}{e}-\frac{2\left(ex^2+d\right)^{\frac{5}{2}}d}{e^2}\right)a+\frac{1}{2}b\int 2\left(ex^5+dx^3\right)\sqrt{ex^2+d}\,\arctan\left(cx\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/35*(5*(e*x^2 + d)^(5/2)*x^2/e - 2*(e*x^2 + d)^(5/2)*d/e^2)*a + 1/2*b*inte
grate(2*(e*x^5 + d*x^3)*sqrt(e*x^2 + d)*arctan(c*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^(3/2),x)
```

```
[Out] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3} \left(a + b \operatorname{atan}{\left(cx \right)}\right) \left(d + ex^{2}\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**(3/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))*(d + e*x**2)**(3/2), x)
```

3.1184 $\int x^2 \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=119

$$b\text{Int}\left(x^2\tan^{-1}(cx)\left(d+ex^2\right)^{3/2},x\right)-\frac{ad^3\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{16e^{3/2}}+\frac{ad^2x\sqrt{d+ex^2}}{16e}+\frac{1}{8}adx^3\sqrt{d+ex^2}+\frac{1}{6}ax^3\left(d+ex^2\right)^{3/2}$$

```
[Out] 1/6*a*x^3*(e*x^2+d)^(3/2)-1/16*a*d^3*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(
3/2)+1/16*a*d^2*x*(e*x^2+d)^(1/2)/e+1/8*a*d*x^3*(e*x^2+d)^(1/2)+b*Unintegra
ble(x^2*(e*x^2+d)^(3/2)*arctan(c*x),x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Int[x^2*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (a*d^2*x*Sqrt[d + e*x^2])/(16*e) + (a*d*x^3*Sqrt[d + e*x^2])/8 + (a*x^3*(d
+ e*x^2)^(3/2))/6 - (a*d^3*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(16*e^(3/2
)) + b*Defer[Int][x^2*(d + e*x^2)^(3/2)*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}
\int x^2\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)dx &= a\int x^2\left(d+ex^2\right)^{3/2}dx+b\int x^2\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)\,dx\\
&= \frac{1}{6}ax^3\left(d+ex^2\right)^{3/2}+b\int x^2\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)\,dx+\frac{1}{2}(ad)\int x^2\sqrt{d+}\\
&= \frac{1}{8}adx^3\sqrt{d+ex^2}+\frac{1}{6}ax^3\left(d+ex^2\right)^{3/2}+b\int x^2\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)\,dx\\
&= \frac{ad^2x\sqrt{d+ex^2}}{16e}+\frac{1}{8}adx^3\sqrt{d+ex^2}+\frac{1}{6}ax^3\left(d+ex^2\right)^{3/2}+b\int x^2\left(d+ex^2\right.\\
&= \frac{ad^2x\sqrt{d+ex^2}}{16e}+\frac{1}{8}adx^3\sqrt{d+ex^2}+\frac{1}{6}ax^3\left(d+ex^2\right)^{3/2}+b\int x^2\left(d+ex^2\right.\\
&= \frac{ad^2x\sqrt{d+ex^2}}{16e}+\frac{1}{8}adx^3\sqrt{d+ex^2}+\frac{1}{6}ax^3\left(d+ex^2\right)^{3/2}-\frac{ad^3\tanh^{-1}\left(\frac{\sqrt{}}{\sqrt{d}}\right.}{16e^{3/2}}
\end{aligned}$$

Mathematica [A] time = 11.31, size = 0, normalized size = 0.00

$$\int x^2\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^2*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^2*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(aex^4+adx^2+\left(bex^4+bdx^2\right)\arctan(cx)\right)\sqrt{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e*x^4 + a*d*x^2 + (b*e*x^4 + b*d*x^2)*arctan(c*x))*sqrt(e*x^2 +
 d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.08, size = 0, normalized size = 0.00

$$\int x^{2} \left(e\,x^{2}+d\right)^{\frac{3}{2}} \left(a +b \arctan \left(c x\right)\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^2*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^(3/2),x)
```

```
[Out] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2} \left(a + b \operatorname{atan}{\left(c x \right)}\right) \left(d + e x^{2}\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**(3/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))*(d + e*x**2)**(3/2), x)
```

3.1185 $\int x\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=181

$$\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e}-\frac{b\left(c^2d-e\right)^{5/2}\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{5c^5e}-\frac{bx\left(7c^2d-4e\right)\sqrt{d+ex^2}}{40c^3}-\frac{b\left(15c^4d^2-20c^2de+8e^2\right)}{40c^5\sqrt{e}}$$

```
[Out] -1/20*b*x*(e*x^2+d)^(3/2)/c+1/5*(e*x^2+d)^(5/2)*(a+b*arctan(c*x))/e-1/5*b*(
c^2*d-e)^(5/2)*arctan(x*(c^2*d-e)^(1/2)/(e*x^2+d)^(1/2))/c^5/e-1/40*b*(15*c
^4*d^2-20*c^2*d*e+8*e^2)*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/c^5/e^(1/2)-1/4
0*b*(7*c^2*d-4*e)*x*(e*x^2+d)^(1/2)/c^3
```

Rubi [A] time = 0.23, antiderivative size = 181, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4974, 416, 528, 523, 217, 206, 377, 203}

$$\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e}-\frac{b\left(15c^4d^2-20c^2de+8e^2\right)\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{40c^5\sqrt{e}}-\frac{bx\left(7c^2d-4e\right)\sqrt{d+ex^2}}{40c^3}-\frac{b\left(c^2d-e\right)}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(7*c^2*d - 4*e)*x*Sqrt[d + e*x^2])/(40*c^3) - (b*x*(d + e*x^2)^(3/2))/(
20*c) + ((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/(5*e) - (b*(c^2*d - e)^(5/2
)*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(5*c^5*e) - (b*(15*c^4*d^2 -
 20*c^2*d*e + 8*e^2)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(40*c^5*Sqrt[e])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 416

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(d*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1))/(b*(n*(p + q) + 1)),
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
```

```
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)dx=\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^{5/2}}{1+c^2x^2}dx}{5e}$$

$$=-\frac{bx\left(d+ex^2\right)^{3/2}}{20c}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5e}-\frac{b\int\frac{\sqrt{d+ex^2}\left(d\left(4c^2d-e\right.\right.}{1+c^{\ldots}}}{20c}$$

$$=-\frac{b\left(7c^2d-4e\right)x\sqrt{d+ex^2}}{40c^3}-\frac{bx\left(d+ex^2\right)^{3/2}}{20c}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}\ldots\right.}{5e}$$

$$=-\frac{b\left(7c^2d-4e\right)x\sqrt{d+ex^2}}{40c^3}-\frac{bx\left(d+ex^2\right)^{3/2}}{20c}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}\ldots\right.}{5e}$$

$$=-\frac{b\left(7c^2d-4e\right)x\sqrt{d+ex^2}}{40c^3}-\frac{bx\left(d+ex^2\right)^{3/2}}{20c}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}\ldots\right.}{5e}$$

$$=-\frac{b\left(7c^2d-4e\right)x\sqrt{d+ex^2}}{40c^3}-\frac{bx\left(d+ex^2\right)^{3/2}}{20c}+\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}\ldots\right.}{5e}$$

Mathematica [C] time = 0.46, size = 313, normalized size = 1.73

$$\frac{c^2\sqrt{d+ex^2}\left(8ac^3\left(d+ex^2\right)^2+bex\left(4e-c^2\left(9d+2ex^2\right)\right)\right)+8bc^5\tan^{-1}(cx)\left(d+ex^2\right)^{5/2}-4ib\left(c^2d-e\right)^{5/2}\log\left(\ldots\right.}{\ldots}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c^2*Sqrt[d + e*x^2]*(8*a*c^3*(d + e*x^2)^2 + b*e*x*(4*e - c^2*(9*d + 2*e*x
^2))) + 8*b*c^5*(d + e*x^2)^(5/2)*ArcTan[c*x] - (4*I)*b*(c^2*d - e)^(5/2)*L
og[(20*c^6*e*((-I)*c*d + e*x - I*Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*
d - e)^(7/2)*(-I + c*x))] + (4*I)*b*(c^2*d - e)^(5/2)*Log[(20*c^6*e*(I*c*d
+ e*x + I*Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(7/2)*(I + c*x))
] - b*Sqrt[e]*(15*c^4*d^2 - 20*c^2*d*e + 8*e^2)*Log[e*x + Sqrt[e]*Sqrt[d +
e*x^2]])/(40*c^5*e)
```

fricas [A] time = 3.63, size = 1192, normalized size = 6.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] [1/80*((15*b*c^4*d^2 - 20*b*c^2*d*e + 8*b*e^2)*sqrt(e)*log(-2*e*x^2 + 2*sqr
t(e*x^2 + d)*sqrt(e)*x - d) + 4*(b*c^4*d^2 - 2*b*c^2*d*e + b*e^2)*sqrt(-c^2
*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2
- 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*
x^4 + 2*c^2*x^2 + 1)) + 2*(8*a*c^5*e^2*x^4 + 16*a*c^5*d*e*x^2 - 2*b*c^4*e^2
*x^3 + 8*a*c^5*d^2 - (9*b*c^4*d*e - 4*b*c^2*e^2)*x + 8*(b*c^5*e^2*x^4 + 2*b
*c^5*d*e*x^2 + b*c^5*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^5*e), -1/80*(8*(
b*c^4*d^2 - 2*b*c^2*d*e + b*e^2)*sqrt(c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)
*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 -
d*e)*x)) - (15*b*c^4*d^2 - 20*b*c^2*d*e + 8*b*e^2)*sqrt(e)*log(-2*e*x^2 + 2
*sqrt(e*x^2 + d)*sqrt(e)*x - d) - 2*(8*a*c^5*e^2*x^4 + 16*a*c^5*d*e*x^2 - 2
*b*c^4*e^2*x^3 + 8*a*c^5*d^2 - (9*b*c^4*d*e - 4*b*c^2*e^2)*x + 8*(b*c^5*e^2
*x^4 + 2*b*c^5*d*e*x^2 + b*c^5*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^5*e),
1/40*((15*b*c^4*d^2 - 20*b*c^2*d*e + 8*b*e^2)*sqrt(-e)*arctan(sqrt(-e)*x/sq
rt(e*x^2 + d)) + 2*(b*c^4*d^2 - 2*b*c^2*d*e + b*e^2)*sqrt(-c^2*d + e)*log((
(c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 - 4*((c^2*d -
 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x
^2 + 1)) + (8*a*c^5*e^2*x^4 + 16*a*c^5*d*e*x^2 - 2*b*c^4*e^2*x^3 + 8*a*c^5*
d^2 - (9*b*c^4*d*e - 4*b*c^2*e^2)*x + 8*(b*c^5*e^2*x^4 + 2*b*c^5*d*e*x^2 +
b*c^5*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^5*e), -1/40*(4*(b*c^4*d^2 - 2*b
*c^2*d*e + b*e^2)*sqrt(c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)
*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) - (15*
b*c^4*d^2 - 20*b*c^2*d*e + 8*b*e^2)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 +
 d)) - (8*a*c^5*e^2*x^4 + 16*a*c^5*d*e*x^2 - 2*b*c^4*e^2*x^3 + 8*a*c^5*d^2
- (9*b*c^4*d*e - 4*b*c^2*e^2)*x + 8*(b*c^5*e^2*x^4 + 2*b*c^5*d*e*x^2 + b*c^
5*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^5*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 0.97, size = 0, normalized size = 0.00

$$\int x\left(e\,x^{2}+d\right)^{\frac{3}{2}}\left(a+b\arctan\left(c x\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int(x*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d zero or nonzero?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*x^2)^(3/2),x)
```

```
[Out] int(x*(a + b*atan(c*x))*(d + e*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(a + b\operatorname{atan}{\left(cx \right)}\right)\left(d + ex^{2}\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**(3/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x*(a + b*atan(c*x))*(d + e*x**2)**(3/2), x)
```

3.1186 $\int \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) \, dx$

Optimal. Leaf size=23

$$\text{Int}\left(\left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right),x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) \, dx$$

Verification is Not applicable to the result.

```
[In] Int[(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
[Out] Defer[Int][(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]), x]
```

Rubi steps

$$\int \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) \, dx = \int \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) \, dx$$

Mathematica [A] time = 5.25, size = 0, normalized size = 0.00

$$\int \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) \, dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
[Out] Integrate[(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(aex^2+ad+\left(bex^2+bd\right)\arctan\left(cx\right)\right)\sqrt{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.06, size = 0, normalized size = 0.00

$$\int \left(e\,x^2+d\right)^{\frac{3}{2}} \left(a+b\arctan\left(cx\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int (a+b\,\mathrm{atan}\left(c\,x\right))\,{\left(e\,x^2+d\right)}^{3/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*x^2)^(3/2),x)
```

```
[Out] int((a + b*atan(c*x))*(d + e*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a + b \operatorname{atan}{\left(c x \right)}\right) \left(d + e x^{2}\right)^{\frac{3}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(3/2), x)
```

3.1187 $\int \frac{(d+ex^2)^{3/2}(a+b\tan^{-1}(cx))}{x}\,dx$

Optimal. Leaf size=81

$$b\mathrm{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{3/2}}{x},x\right)-ad^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+ad\sqrt{d+ex^2}+\frac{1}{3}a\left(d+ex^2\right)^{3/2}$$

```
[Out] 1/3*a*(e*x^2+d)^(3/2)-a*d^(3/2)*arctanh((e*x^2+d)^(1/2)/d^(1/2))+a*d*(e*x^2
+d)^(1/2)+b*Unintegrable((e*x^2+d)^(3/2)*arctan(c*x)/x,x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] a*d*Sqrt[d + e*x^2] + (a*(d + e*x^2)^(3/2))/3 - a*d^(3/2)*ArcTanh[Sqrt[d +
e*x^2]/Sqrt[d]] + b*Defer[Int][((d + e*x^2)^(3/2)*ArcTan[c*x])/x, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx = a\int \frac{\left(d+ex^2\right)^{3/2}}{x}\,dx+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x}\,dx$$

$$=\frac{1}{2}a\,\mathrm{Subst}\left(\int \frac{(d+ex)^{3/2}}{x}\,dx,x,x^2\right)+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x}\,dx$$

$$=\frac{1}{3}a\left(d+ex^2\right)^{3/2}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x}\,dx+\frac{1}{2}(ad)\,\mathrm{Subst}\left(\int \frac{\sqrt{d+e}}{x}\right.$$

$$=ad\sqrt{d+ex^2}+\frac{1}{3}a\left(d+ex^2\right)^{3/2}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x}\,dx+\frac{1}{2}\left(ad^2\right)\mathrm{S}$$

$$=ad\sqrt{d+ex^2}+\frac{1}{3}a\left(d+ex^2\right)^{3/2}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x}\,dx+\frac{\left(ad^2\right)\mathrm{Sul}}{}$$

$$=ad\sqrt{d+ex^2}+\frac{1}{3}a\left(d+ex^2\right)^{3/2}-ad^{3/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+b\int \frac{\left(d+ex^2\right)}{}$$

Mathematica [A] time = 82.78, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x, x]
```

fricas [A]   time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(aex^2+ad+\left(bex^2+bd\right)\arctan\left(cx\right)\right)\sqrt{ex^2+d}}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d)/x, x
)
```

giac [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A]   time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(a+b\arctan\left(cx\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x,x)
```

maxima [F(-2)]   time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d zero or nonzero?
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x, x)
```

sympy [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(cx\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*atan(c*x))/x,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(3/2)/x, x)
```

3.1188 $\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$

Optimal. Leaf size=90

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{3/2}}{x^2},x\right)-\frac{a\left(d+ex^2\right)^{3/2}}{x}+\frac{3}{2}aex\sqrt{d+ex^2}+\frac{3}{2}ad\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)$$

```
[Out] -a*(e*x^2+d)^(3/2)/x+3/2*a*d*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))*e^(1/2)+3/2
*a*e*x*(e*x^2+d)^(1/2)+b*Unintegrable((e*x^2+d)^(3/2)*arctan(c*x)/x^2,x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] (3*a*e*x*Sqrt[d + e*x^2])/2 - (a*(d + e*x^2)^(3/2))/x + (3*a*d*Sqrt[e]*ArcT
anh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/2 + b*Defer[Int][((d + e*x^2)^(3/2)*ArcTa
n[c*x])/x^2, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx &= a\int \frac{\left(d+ex^2\right)^{3/2}}{x^2}\,dx+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^2}\,dx\\
&= -\frac{a\left(d+ex^2\right)^{3/2}}{x}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^2}\,dx+(3ae)\int \sqrt{d+ex^2}\,dx\\
&= \frac{3}{2}aex\sqrt{d+ex^2}-\frac{a\left(d+ex^2\right)^{3/2}}{x}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^2}\,dx+\frac{1}{2}(3ade)\\
&= \frac{3}{2}aex\sqrt{d+ex^2}-\frac{a\left(d+ex^2\right)^{3/2}}{x}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^2}\,dx+\frac{1}{2}(3ade)\\
&= \frac{3}{2}aex\sqrt{d+ex^2}-\frac{a\left(d+ex^2\right)^{3/2}}{x}+\frac{3}{2}ad\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)+b\int \frac{(d+
\end{aligned}$$

Mathematica [A] time = 9.25, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^2, x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(aex^2+ad+\left(bex^2+bd\right)\arctan(cx)\right)\sqrt{ex^2+d}}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d)/x^2,
 x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^{2}+d\right)^{\frac{3}{2}} \left(a+b\arctan \left(c x\right)\right)}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}}{x^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \operatorname{atan}{\left(c x \right)}\right) \left(d + e x^{2}\right)^{\frac{3}{2}}}{x^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*atan(c*x))/x**2,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(3/2)/x**2, x)
```

3.1189 $\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$

Optimal. Leaf size=90

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{3/2}}{x^3},x\right)-\frac{a\left(d+ex^2\right)^{3/2}}{2x^2}+\frac{3}{2}ae\sqrt{d+ex^2}-\frac{3}{2}a\sqrt{d}\,e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)$$

```
[Out] -1/2*a*(e*x^2+d)^(3/2)/x^2-3/2*a*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))*d^(1/2)
+3/2*a*e*(e*x^2+d)^(1/2)+b*Unintegrable((e*x^2+d)^(3/2)*arctan(c*x)/x^3,x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] (3*a*e*Sqrt[d + e*x^2])/2 - (a*(d + e*x^2)^(3/2))/(2*x^2) - (3*a*Sqrt[d]*e*
ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/2 + b*Defer[Int][((d + e*x^2)^(3/2)*ArcTa
n[c*x])/x^3, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx &= a\int \frac{\left(d+ex^2\right)^{3/2}}{x^3}\,dx+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^3}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{(d+ex)^{3/2}}{x^2}\,dx,x,x^2\right)+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^3}\,dx\\
&= -\frac{a\left(d+ex^2\right)^{3/2}}{2x^2}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^3}\,dx+\frac{1}{4}(3ae)\,\text{Subst}\left(\int \frac{\sqrt{d+}}{x}\right.\\
&= \frac{3}{2}ae\sqrt{d+ex^2}-\frac{a\left(d+ex^2\right)^{3/2}}{2x^2}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^3}\,dx+\frac{1}{4}(3ade)\,\text{S}\\
&= \frac{3}{2}ae\sqrt{d+ex^2}-\frac{a\left(d+ex^2\right)^{3/2}}{2x^2}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^3}\,dx+\frac{1}{2}(3ad)\,\text{Su}\\
&= \frac{3}{2}ae\sqrt{d+ex^2}-\frac{a\left(d+ex^2\right)^{3/2}}{2x^2}-\frac{3}{2}a\sqrt{d}\,e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+b\int \frac{(d+ex}{}
\end{aligned}$$

Mathematica [A] time = 55.09, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^3, x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(aex^2+ad+\left(bex^2+bd\right)\arctan\left(cx\right)\right)\sqrt{ex^2+d}}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d)/x^3,
 x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.04, size = 0, normalized size = 0.00

$$\int\frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(a+b\arctan\left(cx\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^3,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(3\sqrt{d}\,e\,\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)-3\sqrt{ex^2+d}\,e-\frac{\left(ex^2+d\right)^{\frac{3}{2}}e}{d}+\frac{\left(ex^2+d\right)^{\frac{5}{2}}}{dx^2}\right)a+\frac{1}{2}\,b\int\frac{2\left(ex^2+d\right)^{\frac{3}{2}}\arctan\left(cx\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*(3*sqrt(d)*e*arcsinh(d/(sqrt(d*e)*abs(x))) - 3*sqrt(e*x^2 + d)*e - (e*
x^2 + d)^(3/2)*e/d + (e*x^2 + d)^(5/2)/(d*x^2))*a + 1/2*b*integrate(2*(e*x^
2 + d)^(3/2)*arctan(c*x)/x^3, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^3,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^3, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\operatorname{atan}\left(cx\right)\right)\left(d+ex^2\right)^{\frac{3}{2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*atan(c*x))/x**3,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(3/2)/x**3, x)
```

3.1190 $\int \frac{(d+ex^2)^{3/2}(a+b\tan^{-1}(cx))}{x^4}\,dx$

Optimal. Leaf size=88

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{3/2}}{x^4},x\right)+ae^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)-\frac{ae\sqrt{d+ex^2}}{x}-\frac{a\left(d+ex^2\right)^{3/2}}{3x^3}$$

```
[Out] -1/3*a*(e*x^2+d)^(3/2)/x^3+a*e^(3/2)*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))-a*e
*(e*x^2+d)^(1/2)/x+b*Unintegrable((e*x^2+d)^(3/2)*arctan(c*x)/x^4,x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] -((a*e*Sqrt[d + e*x^2])/x) - (a*(d + e*x^2)^(3/2))/(3*x^3) + a*e^(3/2)*ArcT
anh[(Sqrt[e]*x)/Sqrt[d + e*x^2]] + b*Defer[Int][((d + e*x^2)^(3/2)*ArcTan[c
*x])/x^4, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx &= a\int \frac{\left(d+ex^2\right)^{3/2}}{x^4}\,dx+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^4}\,dx\\
&= -\frac{a\left(d+ex^2\right)^{3/2}}{3x^3}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^4}\,dx+(ae)\int \frac{\sqrt{d+ex^2}}{x^2}\,dx\\
&= -\frac{ae\sqrt{d+ex^2}}{x}-\frac{a\left(d+ex^2\right)^{3/2}}{3x^3}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^4}\,dx+\left(ae^2\right)\int\\
&= -\frac{ae\sqrt{d+ex^2}}{x}-\frac{a\left(d+ex^2\right)^{3/2}}{3x^3}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^4}\,dx+\left(ae^2\right)S\\
&= -\frac{ae\sqrt{d+ex^2}}{x}-\frac{a\left(d+ex^2\right)^{3/2}}{3x^3}+ae^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)+b\int \frac{(d+e}{}
\end{aligned}$$

Mathematica [A] time = 31.66, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^4, x]
```

fricas [A] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(aex^2+ad+\left(bex^2+bd\right)\arctan(cx)\right)\sqrt{ex^2+d}}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d)/x^4,
 x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**A**] time = 1.09, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^{2}+d\right)^{\frac{3}{2}} \left(a+b \arctan \left(c x\right)\right)}{x^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^4,x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}}{x^4} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^4,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^4, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \operatorname{atan}{\left(c x \right)}\right) \left(d + e x^{2}\right)^{\frac{3}{2}}}{x^{4}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(3/2)/x**4, x)
```

3.1191 $\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$

Optimal. Leaf size=95

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{3/2}}{x^5},x\right)-\frac{3ae^2\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{8\sqrt{d}}-\frac{3ae\sqrt{d+ex^2}}{8x^2}-\frac{a\left(d+ex^2\right)^{3/2}}{4x^4}$$

```
[Out] -1/4*a*(e*x^2+d)^(3/2)/x^4-3/8*a*e^2*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(1/
2)-3/8*a*e*(e*x^2+d)^(1/2)/x^2+b*Unintegrable((e*x^2+d)^(3/2)*arctan(c*x)/x
^5,x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] (-3*a*e*Sqrt[d + e*x^2])/(8*x^2) - (a*(d + e*x^2)^(3/2))/(4*x^4) - (3*a*e^2
*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(8*Sqrt[d]) + b*Defer[Int][((d + e*x^2)^
(3/2)*ArcTan[c*x])/x^5, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx &= a\int \frac{\left(d+ex^2\right)^{3/2}}{x^5}\,dx+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^5}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{(d+ex)^{3/2}}{x^3}\,dx,x,x^2\right)+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^5}\,dx\\
&= -\frac{a\left(d+ex^2\right)^{3/2}}{4x^4}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^5}\,dx+\frac{1}{8}(3ae)\,\text{Subst}\left(\int \frac{\sqrt{d}}{}\right.\\
&= -\frac{3ae\sqrt{d+ex^2}}{8x^2}-\frac{a\left(d+ex^2\right)^{3/2}}{4x^4}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^5}\,dx+\frac{1}{16}(\\
&= -\frac{3ae\sqrt{d+ex^2}}{8x^2}-\frac{a\left(d+ex^2\right)^{3/2}}{4x^4}+b\int \frac{\left(d+ex^2\right)^{3/2}\tan^{-1}(cx)}{x^5}\,dx+\frac{1}{8}(3a\\
&= -\frac{3ae\sqrt{d+ex^2}}{8x^2}-\frac{a\left(d+ex^2\right)^{3/2}}{4x^4}-\frac{3ae^2\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{8\sqrt{d}}+b\int \frac{(d+ex^2}{}
\end{aligned}$$

Mathematica [A] time = 57.17, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^5}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^5,x]
```

```
[Out] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^5, x]
```

fricas [A] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(aex^2+ad+\left(bex^2+bd\right)\arctan\left(cx\right)\right)\sqrt{ex^2+d}}{x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^5,x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d)/x^5,
 x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.06, size = 0, normalized size = 0.00

$$\int\frac{\left(e\,x^2+d\right)^{\frac{3}{2}}\left(a+b\arctan\left(cx\right)\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^5,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^5,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{8}\left(\frac{3\,e^2\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{\sqrt{d}}-\frac{\left(ex^2+d\right)^{\frac{3}{2}}e^2}{d^2}-\frac{3\,\sqrt{ex^2+d}\,e^2}{d}+\frac{\left(ex^2+d\right)^{\frac{5}{2}}e}{d^2x^2}+\frac{2\left(ex^2+d\right)^{\frac{5}{2}}}{dx^4}\right)a+\frac{1}{2}\,b\int\frac{2\left(ex^2+d\right)^{\frac{3}{2}}\text{ar}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^5,x, algorithm="maxima")
```

```
[Out] -1/8*(3*e^2*arcsinh(d/(sqrt(d*e)*abs(x)))/sqrt(d) - (e*x^2 + d)^(3/2)*e^2/d
^2 - 3*sqrt(e*x^2 + d)*e^2/d + (e*x^2 + d)^(5/2)*e/(d^2*x^2) + 2*(e*x^2 + d
)^(5/2)/(d*x^4))*a + 1/2*b*integrate(2*(e*x^2 + d)^(3/2)*arctan(c*x)/x^5, x
)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^5,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^5, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(cx))\left(d+ex^2\right)^{\frac{3}{2}}}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*atan(c*x))/x**5,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(3/2)/x**5, x)
```

3.1192 $\int \frac{(d+ex^2)^{3/2}(a+b\tan^{-1}(cx))}{x^6}\,dx$

Optimal. Leaf size=178

$$-\frac{(d+ex^2)^{5/2}(a+b\tan^{-1}(cx))}{5dx^5}+\frac{bc(4c^2d-7e)\sqrt{d+ex^2}}{40x^2}+\frac{b(c^2d-e)^{5/2}\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{5d}-\frac{bc(8c^4d^2-20c^2de+}{40}$$

```
[Out] -1/20*b*c*(e*x^2+d)^(3/2)/x^4-1/5*(e*x^2+d)^(5/2)*(a+b*arctan(c*x))/d/x^5+1
/5*b*(c^2*d-e)^(5/2)*arctanh(c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d-1/40*b*c*
(8*c^4*d^2-20*c^2*d*e+15*e^2)*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(1/2)+1/40
*b*c*(4*c^2*d-7*e)*(e*x^2+d)^(1/2)/x^2
```

Rubi [A] time = 0.32, antiderivative size = 178, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {264, 4976, 12, 446, 98, 149, 156, 63, 208}

$$-\frac{(d+ex^2)^{5/2}(a+b\tan^{-1}(cx))}{5dx^5}-\frac{bc(8c^4d^2-20c^2de+15e^2)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{40\sqrt{d}}+\frac{bc(4c^2d-7e)\sqrt{d+ex^2}}{40x^2}+\frac{b(c^2d-}{}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] (b*c*(4*c^2*d - 7*e)*Sqrt[d + e*x^2])/(40*x^2) - (b*c*(d + e*x^2)^(3/2))/(2
0*x^4) - ((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/(5*d*x^5) - (b*c*(8*c^4*d^
2 - 20*c^2*d*e + 15*e^2)*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(40*Sqrt[d]) + (
b*(c^2*d - e)^(5/2)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(5*d)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 98

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_
))^(p_.), x_Symbol] :> Simp[((b*c - a*d)*(a + b*x)^(m + 1)*(c + d*x)^(n - 1
)*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] + Dist[1/(b*(b*e - a*f)*(m
 + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 2)*(e + f*x)^p*Simp[a*d*(d*e*(
n - 1) + c*f*(p + 1)) + b*c*(d*e*(m - n + 2) - c*f*(m + p + 2)) + d*(a*d*f*
(n + p) + b*(d*e*(m + 1) - c*f*(m + n + p + 1)))*x, x], x], x] /; FreeQ[{a,
 b, c, d, e, f, p}, x] && LtQ[m, -1] && GtQ[n, 1] && (IntegersQ[2*m, 2*n, 2
*p] || IntegersQ[m, n + p] || IntegersQ[p, m + n])
```

Rule 149

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_)
)^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[((b*g - a*h)*(a + b*x)^(m +
1)*(c + d*x)^n*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] - Dist[1/(b*(
```

```
b*e - a*f)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 1)*(e + f*x)^p*Si
mp[b*c*(f*g - e*h)*(m + 1) + (b*g - a*h)*(d*e*n + c*f*(p + 1)) + d*(b*(f*g
- e*h)*(m + 1) + f*(b*g - a*h)*(n + p + 1))*x, x], x], x] /; FreeQ[{a, b, c
, d, e, f, g, h, p}, x] && LtQ[m, -1] && GtQ[n, 0] && IntegerQ[m]
```

Rule 156

```
Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*
((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e +
f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c
 + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{x^6}\,dx = -\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} - (bc)\int \frac{\left(d+ex^2\right)^{5/2}}{5x^5\left(-d-c^2dx^2\right)}\,dx$$

$$= -\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} - \frac{1}{5}(bc)\int \frac{\left(d+ex^2\right)^{5/2}}{x^5\left(-d-c^2dx^2\right)}\,dx$$

$$= -\frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} - \frac{1}{10}(bc)\,\text{Subst}\left(\int \frac{(d+ex)^{5/2}}{x^3\left(-d-c^2dx\right)}\,dx, x, x^2\right.$$

$$= -\frac{bc\left(d+ex^2\right)^{3/2}}{20x^4} - \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5} - \frac{(bc)\,\text{Subst}\left(\int \frac{\sqrt{d+ex}\left(-\frac{1}{2}\right.}{}\right.}{}$$

$$= \frac{bc\left(4c^2d-7e\right)\sqrt{d+ex^2}}{40x^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20x^4} - \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5}$$

$$= \frac{bc\left(4c^2d-7e\right)\sqrt{d+ex^2}}{40x^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20x^4} - \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5}$$

$$= \frac{bc\left(4c^2d-7e\right)\sqrt{d+ex^2}}{40x^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20x^4} - \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5}$$

$$= \frac{bc\left(4c^2d-7e\right)\sqrt{d+ex^2}}{40x^2} - \frac{bc\left(d+ex^2\right)^{3/2}}{20x^4} - \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{5dx^5}$$

Mathematica [C] time = 0.50, size = 334, normalized size = 1.88

$$\frac{-\sqrt{d+ex^2}\left(8a\left(d+ex^2\right)^2+bcdx\left(d\left(2-4c^2x^2\right)+9ex^2\right)\right)+4bx^5\left(c^2d-e\right)^{5/2}\log\left(-\frac{20cd\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)\left(c^2d-e\right)^{7/2}}\right)+4b}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/x^6,x]
```

```
[Out] (-(Sqrt[d + e*x^2]*(8*a*(d + e*x^2)^2 + b*c*d*x*(9*e*x^2 + d*(2 - 4*c^2*x^2
)))) - 8*b*(d + e*x^2)^(5/2)*ArcTan[c*x] + b*c*Sqrt[d]*(8*c^4*d^2 - 20*c^2*
d*e + 15*e^2)*x^5*Log[x] - b*c*Sqrt[d]*(8*c^4*d^2 - 20*c^2*d*e + 15*e^2)*x^
5*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] + 4*b*(c^2*d - e)^(5/2)*x^5*Log[(-20*c*d
*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(7/2)*(I +
 c*x))] + 4*b*(c^2*d - e)^(5/2)*x^5*Log[(-20*c*d*(c*d + I*e*x + Sqrt[c^2*d
- e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(7/2)*(-I + c*x))])/(40*d*x^5)
```

fricas [A] time = 1.27, size = 1145, normalized size = 6.43

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^6,x, algorithm="fricas")
```

```
[Out] [1/80*(4*(b*c^4*d^2 - 2*b*c^2*d*e + b*e^2)*sqrt(c^2*d - e)*x^5*log((c^4*e^2
*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2
 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x
```

```
^2 + 1)) + (8*b*c^5*d^2 - 20*b*c^3*d*e + 15*b*c*e^2)*sqrt(d)*x^5*log(-(e*x^
2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) - 2*(8*a*e^2*x^4 + 2*b*c*d^2*x +
16*a*d*e*x^2 - (4*b*c^3*d^2 - 9*b*c*d*e)*x^3 + 8*a*d^2 + 8*(b*e^2*x^4 + 2*b
*d*e*x^2 + b*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(d*x^5), 1/80*(8*(b*c^4*d^2
 - 2*b*c^2*d*e + b*e^2)*sqrt(-c^2*d + e)*x^5*arctan(-1/2*(c^2*e*x^2 + 2*c^2
*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^
2)*x^2)) + (8*b*c^5*d^2 - 20*b*c^3*d*e + 15*b*c*e^2)*sqrt(d)*x^5*log(-(e*x^
2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) - 2*(8*a*e^2*x^4 + 2*b*c*d^2*x +
16*a*d*e*x^2 - (4*b*c^3*d^2 - 9*b*c*d*e)*x^3 + 8*a*d^2 + 8*(b*e^2*x^4 + 2*b
*d*e*x^2 + b*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(d*x^5), 1/40*((8*b*c^5*d^2
 - 20*b*c^3*d*e + 15*b*c*e^2)*sqrt(-d)*x^5*arctan(sqrt(-d)/sqrt(e*x^2 + d))
 + 2*(b*c^4*d^2 - 2*b*c^2*d*e + b*e^2)*sqrt(c^2*d - e)*x^5*log((c^4*e^2*x^4
 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2
*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 +
 1)) - (8*a*e^2*x^4 + 2*b*c*d^2*x + 16*a*d*e*x^2 - (4*b*c^3*d^2 - 9*b*c*d*e
)*x^3 + 8*a*d^2 + 8*(b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*arctan(c*x))*sqrt(e*x
^2 + d))/(d*x^5), 1/40*(4*(b*c^4*d^2 - 2*b*c^2*d*e + b*e^2)*sqrt(-c^2*d + e
)*x^5*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d
)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) + (8*b*c^5*d^2 - 20*b*c^3*d*e
+ 15*b*c*e^2)*sqrt(-d)*x^5*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - (8*a*e^2*x^4
+ 2*b*c*d^2*x + 16*a*d*e*x^2 - (4*b*c^3*d^2 - 9*b*c*d*e)*x^3 + 8*a*d^2 + 8*
(b*e^2*x^4 + 2*b*d*e*x^2 + b*d^2)*arctan(c*x))*sqrt(e*x^2 + d))/(d*x^5)]
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^6,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [**F**] time = 1.18, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^{2}+d\right)^{\frac{3}{2}} \left(a+b\arctan \left(c x\right)\right)}{x^{6}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^6,x)
```

```
[Out] int((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^6,x)
```

maxima [**F(-2)**] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(3/2)*(a+b*arctan(c*x))/x^6,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{3/2}}{x^6} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^6,x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(3/2))/x^6, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\operatorname{atan}(cx))\left(d+ex^2\right)^{\frac{3}{2}}}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(3/2)*(a+b*atan(c*x))/x**6,x)
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(3/2)/x**6, x)
```

3.1193 $\int x^3 \left(d+e x^2\right)^{5/2} \left(a+b \tan^{-1}(c x)\right) dx$

Optimal. Leaf size=345

$$\frac{\left(d+ex^2\right)^{9/2}\left(a+b\tan^{-1}(cx)\right)}{9e^2}-\frac{d\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2}+\frac{b\left(c^2d-e\right)^{7/2}\left(2c^2d+7e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{63c^9e^2}-bx$$

```
[Out] -1/12096*b*(69*c^4*d^2-520*c^2*d*e+336*e^2)*x*(e*x^2+d)^(3/2)/c^5/e-1/3024*
b*(33*c^2*d-56*e)*x*(e*x^2+d)^(5/2)/c^3/e-1/72*b*x*(e*x^2+d)^(7/2)/c/e-1/7*
d*(e*x^2+d)^(7/2)*(a+b*arctan(c*x))/e^2+1/9*(e*x^2+d)^(9/2)*(a+b*arctan(c*x
))/e^2+1/63*b*(c^2*d-e)^(7/2)*(2*c^2*d+7*e)*arctan(x*(c^2*d-e)^(1/2)/(e*x^2
+d)^(1/2))/c^9/e^2+1/8064*b*(315*c^8*d^4+840*c^6*d^3*e-3024*c^4*d^2*e^2+288
0*c^2*d*e^3-896*e^4)*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/c^9/e^(3/2)+1/8064*
b*(59*c^6*d^3+712*c^4*d^2*e-1104*c^2*d*e^2+448*e^3)*x*(e*x^2+d)^(1/2)/c^7/e
```

Rubi [A] time = 0.58, antiderivative size = 345, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {266, 43, 4976, 12, 528, 523, 217, 206, 377, 203}

$$\frac{\left(d+ex^2\right)^{9/2}\left(a+b\tan^{-1}(cx)\right)}{9e^2}-\frac{d\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2}-\frac{bx\left(69c^4d^2-520c^2de+336e^2\right)\left(d+ex^2\right)^{3/2}}{12096c^5e}+\cdots$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (b*(59*c^6*d^3 + 712*c^4*d^2*e - 1104*c^2*d*e^2 + 448*e^3)*x*Sqrt[d + e*x^2
])/(8064*c^7*e) - (b*(69*c^4*d^2 - 520*c^2*d*e + 336*e^2)*x*(d + e*x^2)^(3/
2))/(12096*c^5*e) - (b*(33*c^2*d - 56*e)*x*(d + e*x^2)^(5/2))/(3024*c^3*e)
- (b*x*(d + e*x^2)^(7/2))/(72*c*e) - (d*(d + e*x^2)^(7/2)*(a + b*ArcTan[c*x
]))/(7*e^2) + ((d + e*x^2)^(9/2)*(a + b*ArcTan[c*x]))/(9*e^2) + (b*(c^2*d -
 e)^(7/2)*(2*c^2*d + 7*e)*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(63*
c^9*e^2) + (b*(315*c^8*d^4 + 840*c^6*d^3*e - 3024*c^4*d^2*e^2 + 2880*c^2*d*
e^3 - 896*e^4)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(8064*c^9*e^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
```

```
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right) dx = -\frac{d\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2} + \frac{\left(d+ex^2\right)^{9/2}\left(a+b\tan^{-1}(cx)\right)}{9e^2} - ($$

$$= -\frac{d\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2} + \frac{\left(d+ex^2\right)^{9/2}\left(a+b\tan^{-1}(cx)\right)}{9e^2} - ($$

$$= -\frac{bx\left(d+ex^2\right)^{7/2}}{72ce} - \frac{d\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e^2} + \frac{\left(d+ex^2\right)^{9/2}(a}{9e}$$

$$= -\frac{b\left(33c^2d-56e\right)x\left(d+ex^2\right)^{5/2}}{3024c^3e} - \frac{bx\left(d+ex^2\right)^{7/2}}{72ce} - \frac{d\left(d+ex^2\right)^{7/2}(a}{7e^2}$$

$$= -\frac{b\left(69c^4d^2-520c^2de+336e^2\right)x\left(d+ex^2\right)^{3/2}}{12096c^5e} - \frac{b\left(33c^2d-56e\right)x(d}{3024c^3e}$$

$$= \frac{b\left(59c^6d^3+712c^4d^2e-1104c^2de^2+448e^3\right)x\sqrt{d+ex^2}}{8064c^7e} - \frac{b\left(69c^4d^2-\right.}{}$$

$$= \frac{b\left(59c^6d^3+712c^4d^2e-1104c^2de^2+448e^3\right)x\sqrt{d+ex^2}}{8064c^7e} - \frac{b\left(69c^4d^2-\right.}{}$$

$$= \frac{b\left(59c^6d^3+712c^4d^2e-1104c^2de^2+448e^3\right)x\sqrt{d+ex^2}}{8064c^7e} - \frac{b\left(69c^4d^2-\right.}{}$$

$$= \frac{b\left(59c^6d^3+712c^4d^2e-1104c^2de^2+448e^3\right)x\sqrt{d+ex^2}}{8064c^7e} - \frac{b\left(69c^4d^2-\right.}{}$$

Mathematica [C] time = 0.93, size = 470, normalized size = 1.36

$$-\frac{c^2\sqrt{d+ex^2}\left(384ac^7\left(2d-7ex^2\right)\left(d+ex^2\right)^3+bex\left(3c^6\left(187d^3+558d^2ex^2+424de^2x^4+112e^3x^6\right)-8c^4e(453\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -1/24192*(c^2*Sqrt[d + e*x^2]*(384*a*c^7*(2*d - 7*e*x^2)*(d + e*x^2)^3 + b*
e*x*(-1344*e^3 + 48*c^2*e^2*(83*d + 14*e*x^2) - 8*c^4*e*(453*d^2 + 242*d*e*
x^2 + 56*e^2*x^4) + 3*c^6*(187*d^3 + 558*d^2*e*x^2 + 424*d*e^2*x^4 + 112*e^
3*x^6))) + 384*b*c^9*(2*d - 7*e*x^2)*(d + e*x^2)^(7/2)*ArcTan[c*x] + (192*I
)*b*(c^2*d - e)^(7/2)*(2*c^2*d + 7*e)*Log[((-252*I)*c^10*e^2*(c*d - I*e*x +
 Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(9/2)*(2*c^2*d + 7*e)*(I
+ c*x))] - (192*I)*b*(c^2*d - e)^(7/2)*(2*c^2*d + 7*e)*Log[((252*I)*c^10*e^
2*(c*d + I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(9/2)*(2*
c^2*d + 7*e)*(-I + c*x))] + 3*b*Sqrt[e]*(-315*c^8*d^4 - 840*c^6*d^3*e + 302
4*c^4*d^2*e^2 - 2880*c^2*d*e^3 + 896*e^4)*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]
])/(c^9*e^2)
```

fricas [A] time = 49.89, size = 1978, normalized size = 5.73

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] [-1/48384*(3*(315*b*c^8*d^4 + 840*b*c^6*d^3*e - 3024*b*c^4*d^2*e^2 + 2880*b
*c^2*d*e^3 - 896*b*e^4)*sqrt(e)*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x
- d) + 192*(2*b*c^8*d^4 + b*c^6*d^3*e - 15*b*c^4*d^2*e^2 + 19*b*c^2*d*e^3 -
 7*b*e^4)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^
2*d^2 - 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^
2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 2*(2688*a*c^9*e^4*x^8 + 7296*a*c
^9*d*e^3*x^6 - 336*b*c^8*e^4*x^7 + 5760*a*c^9*d^2*e^2*x^4 + 384*a*c^9*d^3*e
*x^2 - 768*a*c^9*d^4 - 8*(159*b*c^8*d*e^3 - 56*b*c^6*e^4)*x^5 - 2*(837*b*c^
8*d^2*e^2 - 968*b*c^6*d*e^3 + 336*b*c^4*e^4)*x^3 - 3*(187*b*c^8*d^3*e - 120
8*b*c^6*d^2*e^2 + 1328*b*c^4*d*e^3 - 448*b*c^2*e^4)*x + 384*(7*b*c^9*e^4*x^
8 + 19*b*c^9*d*e^3*x^6 + 15*b*c^9*d^2*e^2*x^4 + b*c^9*d^3*e*x^2 - 2*b*c^9*d
^4)*arctan(c*x))*sqrt(e*x^2 + d))/(c^9*e^2), 1/48384*(384*(2*b*c^8*d^4 + b*
c^6*d^3*e - 15*b*c^4*d^2*e^2 + 19*b*c^2*d*e^3 - 7*b*e^4)*sqrt(c^2*d - e)*ar
ctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e
- e^2)*x^3 + (c^2*d^2 - d*e)*x)) - 3*(315*b*c^8*d^4 + 840*b*c^6*d^3*e - 302
4*b*c^4*d^2*e^2 + 2880*b*c^2*d*e^3 - 896*b*e^4)*sqrt(e)*log(-2*e*x^2 + 2*sq
rt(e*x^2 + d)*sqrt(e)*x - d) + 2*(2688*a*c^9*e^4*x^8 + 7296*a*c^9*d*e^3*x^6
 - 336*b*c^8*e^4*x^7 + 5760*a*c^9*d^2*e^2*x^4 + 384*a*c^9*d^3*e*x^2 - 768*a
*c^9*d^4 - 8*(159*b*c^8*d*e^3 - 56*b*c^6*e^4)*x^5 - 2*(837*b*c^8*d^2*e^2 -
968*b*c^6*d*e^3 + 336*b*c^4*e^4)*x^3 - 3*(187*b*c^8*d^3*e - 1208*b*c^6*d^2*
e^2 + 1328*b*c^4*d*e^3 - 448*b*c^2*e^4)*x + 384*(7*b*c^9*e^4*x^8 + 19*b*c^9
*d*e^3*x^6 + 15*b*c^9*d^2*e^2*x^4 + b*c^9*d^3*e*x^2 - 2*b*c^9*d^4)*arctan(c
*x))*sqrt(e*x^2 + d))/(c^9*e^2), -1/24192*(3*(315*b*c^8*d^4 + 840*b*c^6*d^3
*e - 3024*b*c^4*d^2*e^2 + 2880*b*c^2*d*e^3 - 896*b*e^4)*sqrt(-e)*arctan(sqr
t(-e)*x/sqrt(e*x^2 + d)) + 96*(2*b*c^8*d^4 + b*c^6*d^3*e - 15*b*c^4*d^2*e^2
 + 19*b*c^2*d*e^3 - 7*b*e^4)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8
*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c
^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - (2688*a*c^9*e
^4*x^8 + 7296*a*c^9*d*e^3*x^6 - 336*b*c^8*e^4*x^7 + 5760*a*c^9*d^2*e^2*x^4
+ 384*a*c^9*d^3*e*x^2 - 768*a*c^9*d^4 - 8*(159*b*c^8*d*e^3 - 56*b*c^6*e^4)*
x^5 - 2*(837*b*c^8*d^2*e^2 - 968*b*c^6*d*e^3 + 336*b*c^4*e^4)*x^3 - 3*(187*
b*c^8*d^3*e - 1208*b*c^6*d^2*e^2 + 1328*b*c^4*d*e^3 - 448*b*c^2*e^4)*x + 38
4*(7*b*c^9*e^4*x^8 + 19*b*c^9*d*e^3*x^6 + 15*b*c^9*d^2*e^2*x^4 + b*c^9*d^3*
e*x^2 - 2*b*c^9*d^4)*arctan(c*x))*sqrt(e*x^2 + d))/(c^9*e^2), 1/24192*(192*
(2*b*c^8*d^4 + b*c^6*d^3*e - 15*b*c^4*d^2*e^2 + 19*b*c^2*d*e^3 - 7*b*e^4)*s
qrt(c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^
2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) - 3*(315*b*c^8*d^4 + 840*
b*c^6*d^3*e - 3024*b*c^4*d^2*e^2 + 2880*b*c^2*d*e^3 - 896*b*e^4)*sqrt(-e)*a
rctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (2688*a*c^9*e^4*x^8 + 7296*a*c^9*d*e^3*
x^6 - 336*b*c^8*e^4*x^7 + 5760*a*c^9*d^2*e^2*x^4 + 384*a*c^9*d^3*e*x^2 - 76
8*a*c^9*d^4 - 8*(159*b*c^8*d*e^3 - 56*b*c^6*e^4)*x^5 - 2*(837*b*c^8*d^2*e^2
 - 968*b*c^6*d*e^3 + 336*b*c^4*e^4)*x^3 - 3*(187*b*c^8*d^3*e - 1208*b*c^6*d
^2*e^2 + 1328*b*c^4*d*e^3 - 448*b*c^2*e^4)*x + 384*(7*b*c^9*e^4*x^8 + 19*b*
c^9*d*e^3*x^6 + 15*b*c^9*d^2*e^2*x^4 + b*c^9*d^3*e*x^2 - 2*b*c^9*d^4)*arcta
n(c*x))*sqrt(e*x^2 + d))/(c^9*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.15, size = 0, normalized size = 0.00

$$\int x^3 \left(e x^2 + d\right)^{\frac{5}{2}} \left(a + b \arctan \left(c x\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^3*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{63}\left(\frac{7\left(ex^2+d\right)^{\frac{7}{2}}x^2}{e}-\frac{2\left(ex^2+d\right)^{\frac{7}{2}}d}{e^2}\right)a+\frac{1}{2}b\int 2\left(e^2x^7+2\,dex^5+d^2x^3\right)\sqrt{ex^2+d}\,\arctan\left(cx\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] 1/63*(7*(e*x^2 + d)^(7/2)*x^2/e - 2*(e*x^2 + d)^(7/2)*d/e^2)*a + 1/2*b*inte
grate(2*(e^2*x^7 + 2*d*e*x^5 + d^2*x^3)*sqrt(e*x^2 + d)*arctan(c*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^(5/2),x)
```

```
[Out] int(x^3*(a + b*atan(c*x))*(d + e*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{3}\left(a+b\,\mathrm{atan}\left(cx\right)\right)\left(d+ex^{2}\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**(5/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))*(d + e*x**2)**(5/2), x)
```

3.1194 $\int x^2 \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=141

$$b\text{Int}\left(x^2\tan^{-1}(cx)\left(d+ex^2\right)^{5/2},x\right)-\frac{5ad^4\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{128e^{3/2}}+\frac{5ad^3x\sqrt{d+ex^2}}{128e}+\frac{5}{64}ad^2x^3\sqrt{d+ex^2}+\frac{5}{48}adx^3\left(d+ex^2\right.$$

[Out] 5/48*a*d*x^3*(e*x^2+d)^(3/2)+1/8*a*x^3*(e*x^2+d)^(5/2)-5/128*a*d^4*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(3/2)+5/128*a*d^3*x*(e*x^2+d)^(1/2)/e+5/64*a*d^2*x^3*(e*x^2+d)^(1/2)+b*Unintegrable(x^2*(e*x^2+d)^(5/2)*arctan(c*x),x)

Rubi [A] time = 0.23, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^2\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

[In] Int[x^2*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]

[Out] (5*a*d^3*x*Sqrt[d + e*x^2])/(128*e) + (5*a*d^2*x^3*Sqrt[d + e*x^2])/64 + (5*a*d*x^3*(d + e*x^2)^(3/2))/48 + (a*x^3*(d + e*x^2)^(5/2))/8 - (5*a*d^4*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(128*e^(3/2)) + b*Defer[Int][x^2*(d + e*x^2)^(5/2)*ArcTan[c*x], x]

Rubi steps

$$\begin{aligned}
\int x^2\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)dx &= a\int x^2\left(d+ex^2\right)^{5/2}dx+b\int x^2\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)\,dx\\
&= \frac{1}{8}ax^3\left(d+ex^2\right)^{5/2}+b\int x^2\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)\,dx+\frac{1}{8}(5ad)\int x^2\left(d+\right.\\
&= \frac{5}{48}adx^3\left(d+ex^2\right)^{3/2}+\frac{1}{8}ax^3\left(d+ex^2\right)^{5/2}+b\int x^2\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)\\
&= \frac{5}{64}ad^2x^3\sqrt{d+ex^2}+\frac{5}{48}adx^3\left(d+ex^2\right)^{3/2}+\frac{1}{8}ax^3\left(d+ex^2\right)^{5/2}+b\int x^2\left(\right.\\
&= \frac{5ad^3x\sqrt{d+ex^2}}{128e}+\frac{5}{64}ad^2x^3\sqrt{d+ex^2}+\frac{5}{48}adx^3\left(d+ex^2\right)^{3/2}+\frac{1}{8}ax^3\left(d+\right.\\
&= \frac{5ad^3x\sqrt{d+ex^2}}{128e}+\frac{5}{64}ad^2x^3\sqrt{d+ex^2}+\frac{5}{48}adx^3\left(d+ex^2\right)^{3/2}+\frac{1}{8}ax^3\left(d+\right.\\
&= \frac{5ad^3x\sqrt{d+ex^2}}{128e}+\frac{5}{64}ad^2x^3\sqrt{d+ex^2}+\frac{5}{48}adx^3\left(d+ex^2\right)^{3/2}+\frac{1}{8}ax^3\left(d+\right.
\end{aligned}$$

Mathematica [A] time = 11.80, size = 0, normalized size = 0.00

$$\int x^2\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

[In] Integrate[x^2*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]

[Out] Integrate[x^2*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]), x]

fricas [A] time = 0.57, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(ae^{2}x^{6}+2\,adex^{4}+ad^{2}x^{2}+\left(be^{2}x^{6}+2\,bdex^{4}+bd^{2}x^{2}\right)\arctan\left(cx\right)\right)\sqrt{ex^{2}+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^6 + 2*a*d*e*x^4 + a*d^2*x^2 + (b*e^2*x^6 + 2*b*d*e*x^4 +
b*d^2*x^2)*arctan(c*x))*sqrt(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.11, size = 0, normalized size = 0.00

$$\int x^{2}\left(e\,x^{2}+d\right)^{\frac{5}{2}}\left(a+b\arctan\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^2*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^(5/2),x)
```

```
[Out] int(x^2*(a + b*atan(c*x))*(d + e*x^2)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2}\left(a+b\,\mathrm{atan}\left(cx\right)\right)\left(d+ex^{2}\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**(5/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))*(d + e*x**2)**(5/2), x)
```

3.1195 $\int x\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=233

$$\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e}-\frac{b\left(c^2d-e\right)^{7/2}\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{7c^7e}-\frac{bx\left(11c^2d-6e\right)\left(d+ex^2\right)^{3/2}}{168c^3}-\frac{bx\left(19c^4d^2-22c^2de\right.}{112c^5}$$

```
[Out] -1/168*b*(11*c^2*d-6*e)*x*(e*x^2+d)^(3/2)/c^3-1/42*b*x*(e*x^2+d)^(5/2)/c+1/
7*(e*x^2+d)^(7/2)*(a+b*arctan(c*x))/e-1/7*b*(c^2*d-e)^(7/2)*arctan(x*(c^2*d
-e)^(1/2)/(e*x^2+d)^(1/2))/c^7/e-1/112*b*(35*c^6*d^3-70*c^4*d^2*e+56*c^2*d*
e^2-16*e^3)*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/c^7/e^(1/2)-1/112*b*(19*c^4*
d^2-22*c^2*d*e+8*e^2)*x*(e*x^2+d)^(1/2)/c^5
```

Rubi [A] time = 0.33, antiderivative size = 233, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4974, 416, 528, 523, 217, 206, 377, 203}

$$\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e}-\frac{bx\left(19c^4d^2-22c^2de+8e^2\right)\sqrt{d+ex^2}}{112c^5}-\frac{b\left(-70c^4d^2e+35c^6d^3+56c^2de^2-16e^3\right)\text{ta}}{112c^7\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(19*c^4*d^2 - 22*c^2*d*e + 8*e^2)*x*Sqrt[d + e*x^2])/(112*c^5) - (b*(11
*c^2*d - 6*e)*x*(d + e*x^2)^(3/2))/(168*c^3) - (b*x*(d + e*x^2)^(5/2))/(42*
c) + ((d + e*x^2)^(7/2)*(a + b*ArcTan[c*x]))/(7*e) - (b*(c^2*d - e)^(7/2)*A
rcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(7*c^7*e) - (b*(35*c^6*d^3 - 70
*c^4*d^2*e + 56*c^2*d*e^2 - 16*e^3)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(
112*c^7*Sqrt[e])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 416

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> Simp[(d*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q - 1))/(b*(n*(p + q) + 1)),
```

```
x] + Dist[1/(b*(n*(p + q) + 1)), Int[(a + b*x^n)^p*(c + d*x^n)^(q - 2)*Simp
[c*(b*c*(n*(p + q) + 1) - a*d) + d*(b*c*(n*(p + 2*q - 1) + 1) - a*d*(n*(q -
 1) + 1))*x^n, x], x], x] /; FreeQ[{a, b, c, d, n, p}, x] && NeQ[b*c - a*d,
 0] && GtQ[q, 1] && NeQ[n*(p + q) + 1, 0] &&  !IGtQ[p, 1] && IntBinomialQ[a
, b, c, d, n, p, q, x]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int x\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)dx=\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e}-\frac{(bc)\int\frac{\left(d+ex^2\right)^{7/2}}{1+c^2x^2}dx}{7e}$$

$$=-\frac{bx\left(d+ex^2\right)^{5/2}}{42c}+\frac{\left(d+ex^2\right)^{7/2}\left(a+b\tan^{-1}(cx)\right)}{7e}-\frac{b\int\frac{\left(d+ex^2\right)^{3/2}\left(d\left(6c^2d\right.\right.}{1+}}{42}$$

$$=-\frac{b\left(11c^2d-6e\right)x\left(d+ex^2\right)^{3/2}}{168c^3}-\frac{bx\left(d+ex^2\right)^{5/2}}{42c}+\frac{\left(d+ex^2\right)^{7/2}\left(a+b\,\mathrm{t}\right.}{7e}$$

$$=-\frac{b\left(19c^4d^2-22c^2de+8e^2\right)x\sqrt{d+ex^2}}{112c^5}-\frac{b\left(11c^2d-6e\right)x\left(d+ex^2\right)^{3/2}}{168c^3}$$

$$=-\frac{b\left(19c^4d^2-22c^2de+8e^2\right)x\sqrt{d+ex^2}}{112c^5}-\frac{b\left(11c^2d-6e\right)x\left(d+ex^2\right)^{3/2}}{168c^3}$$

$$=-\frac{b\left(19c^4d^2-22c^2de+8e^2\right)x\sqrt{d+ex^2}}{112c^5}-\frac{b\left(11c^2d-6e\right)x\left(d+ex^2\right)^{3/2}}{168c^3}$$

$$=-\frac{b\left(19c^4d^2-22c^2de+8e^2\right)x\sqrt{d+ex^2}}{112c^5}-\frac{b\left(11c^2d-6e\right)x\left(d+ex^2\right)^{3/2}}{168c^3}$$

Mathematica [C] time = 0.58, size = 353, normalized size = 1.52

$$c^2\sqrt{d+ex^2}\left(48ac^5\left(d+ex^2\right)^3-bex\left(c^4\left(87d^2+38dex^2+8e^2x^4\right)-6c^2e\left(13d+2ex^2\right)+24e^2\right)\right)+48bc^7\tan^{-1}(cx)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (c^2*Sqrt[d + e*x^2]*(48*a*c^5*(d + e*x^2)^3 - b*e*x*(24*e^2 - 6*c^2*e*(13*
d + 2*e*x^2) + c^4*(87*d^2 + 38*d*e*x^2 + 8*e^2*x^4))) + 48*b*c^7*(d + e*x^
2)^(7/2)*ArcTan[c*x] - (24*I)*b*(c^2*d - e)^(7/2)*Log[(28*c^8*e*((-I)*c*d +
 e*x - I*Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(9/2)*(-I + c*x))
] + (24*I)*b*(c^2*d - e)^(7/2)*Log[(28*c^8*e*(I*c*d + e*x + I*Sqrt[c^2*d -
e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(9/2)*(I + c*x))] + 3*b*Sqrt[e]*(-35*c^
6*d^3 + 70*c^4*d^2*e - 56*c^2*d*e^2 + 16*e^3)*Log[e*x + Sqrt[e]*Sqrt[d + e*
x^2]])/(336*c^7*e)
```

fricas [A] time = 15.58, size = 1562, normalized size = 6.70

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] [-1/672*(3*(35*b*c^6*d^3 - 70*b*c^4*d^2*e + 56*b*c^2*d*e^2 - 16*b*e^3)*sqrt
(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) + 24*(b*c^6*d^3 - 3*b*c
^4*d^2*e + 3*b*c^2*d*e^2 - b*e^3)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*
e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 + 4*((c^2*d - 2*e)*x^3 - d*x)*sq
rt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 2*(48*a*
c^7*e^3*x^6 + 144*a*c^7*d*e^2*x^4 - 8*b*c^6*e^3*x^5 + 144*a*c^7*d^2*e*x^2 +
 48*a*c^7*d^3 - 2*(19*b*c^6*d*e^2 - 6*b*c^4*e^3)*x^3 - 3*(29*b*c^6*d^2*e -
26*b*c^4*d*e^2 + 8*b*c^2*e^3)*x + 48*(b*c^7*e^3*x^6 + 3*b*c^7*d*e^2*x^4 + 3
*b*c^7*d^2*e*x^2 + b*c^7*d^3)*arctan(c*x))*sqrt(e*x^2 + d))/(c^7*e), -1/672
*(48*(b*c^6*d^3 - 3*b*c^4*d^2*e + 3*b*c^2*d*e^2 - b*e^3)*sqrt(c^2*d - e)*ar
ctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e
- e^2)*x^3 + (c^2*d^2 - d*e)*x)) + 3*(35*b*c^6*d^3 - 70*b*c^4*d^2*e + 56*b*
c^2*d*e^2 - 16*b*e^3)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)*x -
d) - 2*(48*a*c^7*e^3*x^6 + 144*a*c^7*d*e^2*x^4 - 8*b*c^6*e^3*x^5 + 144*a*c^
7*d^2*e*x^2 + 48*a*c^7*d^3 - 2*(19*b*c^6*d*e^2 - 6*b*c^4*e^3)*x^3 - 3*(29*b
*c^6*d^2*e - 26*b*c^4*d*e^2 + 8*b*c^2*e^3)*x + 48*(b*c^7*e^3*x^6 + 3*b*c^7*
d*e^2*x^4 + 3*b*c^7*d^2*e*x^2 + b*c^7*d^3)*arctan(c*x))*sqrt(e*x^2 + d))/(c
^7*e), 1/336*(3*(35*b*c^6*d^3 - 70*b*c^4*d^2*e + 56*b*c^2*d*e^2 - 16*b*e^3)
*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - 12*(b*c^6*d^3 - 3*b*c^4*d^2*
e + 3*b*c^2*d*e^2 - b*e^3)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e
^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 + 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2
*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + (48*a*c^7*e^3*x
^6 + 144*a*c^7*d*e^2*x^4 - 8*b*c^6*e^3*x^5 + 144*a*c^7*d^2*e*x^2 + 48*a*c^7
*d^3 - 2*(19*b*c^6*d*e^2 - 6*b*c^4*e^3)*x^3 - 3*(29*b*c^6*d^2*e - 26*b*c^4*
d*e^2 + 8*b*c^2*e^3)*x + 48*(b*c^7*e^3*x^6 + 3*b*c^7*d*e^2*x^4 + 3*b*c^7*d^
2*e*x^2 + b*c^7*d^3)*arctan(c*x))*sqrt(e*x^2 + d))/(c^7*e), -1/336*(24*(b*c
^6*d^3 - 3*b*c^4*d^2*e + 3*b*c^2*d*e^2 - b*e^3)*sqrt(c^2*d - e)*arctan(1/2*
sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^
3 + (c^2*d^2 - d*e)*x)) - 3*(35*b*c^6*d^3 - 70*b*c^4*d^2*e + 56*b*c^2*d*e^2
 - 16*b*e^3)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - (48*a*c^7*e^3*x^
6 + 144*a*c^7*d*e^2*x^4 - 8*b*c^6*e^3*x^5 + 144*a*c^7*d^2*e*x^2 + 48*a*c^7*
d^3 - 2*(19*b*c^6*d*e^2 - 6*b*c^4*e^3)*x^3 - 3*(29*b*c^6*d^2*e - 26*b*c^4*d
*e^2 + 8*b*c^2*e^3)*x + 48*(b*c^7*e^3*x^6 + 3*b*c^7*d*e^2*x^4 + 3*b*c^7*d^2
*e*x^2 + b*c^7*d^3)*arctan(c*x))*sqrt(e*x^2 + d))/(c^7*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 0.97, size = 0, normalized size = 0.00

$$\int x\left(e\,x^{2}+d\right)^{\frac{5}{2}}\left(a+b\arctan\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
[Out] int(x*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d zero or nonzero?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*x^2)^(5/2),x)
[Out] int(x*(a + b*atan(c*x))*(d + e*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x\left(a+b\,\mathrm{atan}\left(cx\right)\right)\left(d+ex^{2}\right)^{\frac{5}{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**(5/2)*(a+b*atan(c*x)),x)
[Out] Integral(x*(a + b*atan(c*x))*(d + e*x**2)**(5/2), x)
```

3.1196 $\int \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=23

$$\text{Int}\left(\left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right),x\right)$$

```
[Out] Unintegrable((e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

Rubi [A] time = 0.03, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]
[Out] Defer[Int][(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]), x]
```

Rubi steps

$$\int \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right)\,dx = \int \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right)\,dx$$

Mathematica [A] time = 5.75, size = 0, normalized size = 0.00

$$\int \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]
[Out] Integrate[(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\arctan\left(cx\right)\right)\sqrt{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))*sqrt(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.10, size = 0, normalized size = 0.00

$$\int \left(e\,x^2+d\right)^{\frac{5}{2}} \left(a+b\arctan\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

```
[Out] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int (a+b\,\mathrm{atan}\left(c\,x\right))\,{\left(e\,x^2+d\right)}^{5/2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*x^2)^(5/2),x)
```

```
[Out] int((a + b*atan(c*x))*(d + e*x^2)^(5/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(a + b \operatorname{atan}{\left(cx \right)}\right) \left(d + ex^{2}\right)^{\frac{5}{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(5/2)*(a+b*atan(c*x)),x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(5/2), x)
```

3.1197 $\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$

Optimal. Leaf size=100

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{5/2}}{x},x\right)-ad^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)+ad^2\sqrt{d+ex^2}+\frac{1}{3}ad\left(d+ex^2\right)^{3/2}+\frac{1}{5}a\left(d+ex^2\right)^{5/2}$$

```
[Out] 1/3*a*d*(e*x^2+d)^(3/2)+1/5*a*(e*x^2+d)^(5/2)-a*d^(5/2)*arctanh((e*x^2+d)^(
1/2)/d^(1/2))+a*d^2*(e*x^2+d)^(1/2)+b*Unintegrable((e*x^2+d)^(5/2)*arctan(c
*x)/x,x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x,x]
```

```
[Out] a*d^2*Sqrt[d + e*x^2] + (a*d*(d + e*x^2)^(3/2))/3 + (a*(d + e*x^2)^(5/2))/5
 - a*d^(5/2)*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]] + b*Defer[Int][((d + e*x^2)^(
5/2)*ArcTan[c*x])/x, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx &= a\int \frac{\left(d+ex^2\right)^{5/2}}{x}\,dx+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{(d+ex)^{5/2}}{x}\,dx,x,x^2\right)+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x}\,dx\\
&= \frac{1}{5}a\left(d+ex^2\right)^{5/2}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x}\,dx+\frac{1}{2}(ad)\,\text{Subst}\left(\int \frac{(d+ex}{x}\right.\\
&= \frac{1}{3}ad\left(d+ex^2\right)^{3/2}+\frac{1}{5}a\left(d+ex^2\right)^{5/2}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x}\,dx+\frac{1}{2}(ac\\
&= ad^2\sqrt{d+ex^2}+\frac{1}{3}ad\left(d+ex^2\right)^{3/2}+\frac{1}{5}a\left(d+ex^2\right)^{5/2}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-}}{x}\\
&= ad^2\sqrt{d+ex^2}+\frac{1}{3}ad\left(d+ex^2\right)^{3/2}+\frac{1}{5}a\left(d+ex^2\right)^{5/2}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-}}{x}\\
&= ad^2\sqrt{d+ex^2}+\frac{1}{3}ad\left(d+ex^2\right)^{3/2}+\frac{1}{5}a\left(d+ex^2\right)^{5/2}-ad^{5/2}\tanh^{-1}\left(\frac{\sqrt{d+ex}}{\sqrt{d}}\right.
\end{aligned}$$

Mathematica [A] time = 83.07, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x,x]
[Out] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x, x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arctan\left(cx\right)\right)\sqrt{ex^2 + d}}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x,x, algorithm="fricas")
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))*sqrt(e*x^2 + d)/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x,x, algorithm="giac")
[Out] Timed out
```

maple [A] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2 + d\right)^{\frac{5}{2}} \left(a + b \arctan\left(cx\right)\right)}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x,x)
[Out] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x,x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d zero or nonzero?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a + b\,\mathrm{atan}\left(c\,x\right)\right)\,\left(e\,x^2 + d\right)^{5/2}}{x}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x,x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))\left(d + ex^2\right)^{\frac{5}{2}}}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(5/2)*(a+b*atan(c*x))/x,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(5/2)/x, x)
```

3.1198 $\int \frac{(d+ex^2)^{5/2}(a+b\tan^{-1}(cx))}{x^2}\,dx$

Optimal. Leaf size=111

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{5/2}}{x^2},x\right)+\frac{15}{8}ad^2\sqrt{e}\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)-\frac{a\left(d+ex^2\right)^{5/2}}{x}+\frac{5}{4}aex\left(d+ex^2\right)^{3/2}+\frac{15}{8}adex\sqrt{d}$$

```
[Out] 5/4*a*e*x*(e*x^2+d)^(3/2)-a*(e*x^2+d)^(5/2)/x+15/8*a*d^2*arctanh(x*e^(1/2)/
(e*x^2+d)^(1/2))*e^(1/2)+15/8*a*d*e*x*(e*x^2+d)^(1/2)+b*Unintegrable((e*x^2
+d)^(5/2)*arctan(c*x)/x^2,x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] (15*a*d*e*x*Sqrt[d + e*x^2])/8 + (5*a*e*x*(d + e*x^2)^(3/2))/4 - (a*(d + e*
x^2)^(5/2))/x + (15*a*d^2*Sqrt[e]*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/8 +
 b*Defer[Int][((d + e*x^2)^(5/2)*ArcTan[c*x])/x^2, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx &= a\int \frac{\left(d+ex^2\right)^{5/2}}{x^2}\,dx+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^2}\,dx\\
&= -\frac{a\left(d+ex^2\right)^{5/2}}{x}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^2}\,dx+(5ae)\int \left(d+ex^2\right)^{3/2}\\
&= \frac{5}{4}aex\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{x}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^2}\,dx+\frac{1}{4}(\\
&= \frac{15}{8}adex\sqrt{d+ex^2}+\frac{5}{4}aex\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{x}+b\int \frac{\left(d+ex^2\right)^{5}}{x}\\
&= \frac{15}{8}adex\sqrt{d+ex^2}+\frac{5}{4}aex\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{x}+b\int \frac{\left(d+ex^2\right)^{5}}{x}\\
&= \frac{15}{8}adex\sqrt{d+ex^2}+\frac{5}{4}aex\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{x}+\frac{15}{8}ad^2\sqrt{e}\tanh
\end{aligned}$$

Mathematica [A] time = 9.20, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^2,x]
```

```
[Out] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^2, x]
```

fricas [A] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arctan\left(cx\right)\right)\sqrt{ex^2 + d}}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^2,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))*sqrt(e*x^2 + d)/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2 + d\right)^{\frac{5}{2}} \left(a + b\arctan\left(cx\right)\right)}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^2,x)
```

```
[Out] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^2,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a + b\,\mathrm{atan}\left(c\,x\right)\right)\,\left(e\,x^2 + d\right)^{5/2}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x^2, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\,\mathrm{atan}\left(cx\right)\right)\left(d + ex^2\right)^{\frac{5}{2}}}{x^2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(5/2)*(a+b*atan(c*x))/x**2,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(5/2)/x**2, x)
```

3.1199 $\int \frac{(d+ex^2)^{5/2}(a+b\tan^{-1}(cx))}{x^3}\,dx$

Optimal. Leaf size=108

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{5/2}}{x^3},x\right)-\frac{5}{2}ad^{3/2}e\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)-\frac{a\left(d+ex^2\right)^{5/2}}{2x^2}+\frac{5}{6}ae\left(d+ex^2\right)^{3/2}+\frac{5}{2}ade\sqrt{d+ex^2}$$

```
[Out] 5/6*a*e*(e*x^2+d)^(3/2)-1/2*a*(e*x^2+d)^(5/2)/x^2-5/2*a*d^(3/2)*e*arctanh((
e*x^2+d)^(1/2)/d^(1/2))+5/2*a*d*e*(e*x^2+d)^(1/2)+b*Unintegrable((e*x^2+d)^
(5/2)*arctan(c*x)/x^3,x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] (5*a*d*e*Sqrt[d + e*x^2])/2 + (5*a*e*(d + e*x^2)^(3/2))/6 - (a*(d + e*x^2)^
(5/2))/(2*x^2) - (5*a*d^(3/2)*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/2 + b*Def
er[Int][((d + e*x^2)^(5/2)*ArcTan[c*x])/x^3, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx &= a\int \frac{\left(d+ex^2\right)^{5/2}}{x^3}\,dx+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^3}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{(d+ex)^{5/2}}{x^2}\,dx,x,x^2\right)+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^3}\,dx\\
&= -\frac{a\left(d+ex^2\right)^{5/2}}{2x^2}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^3}\,dx+\frac{1}{4}(5ae)\,\text{Subst}\left(\int \frac{(d
\end{aligned}$$

$$= \frac{5}{6}ae\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{2x^2}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^3}\,dx+\frac{1}{4}(5$$

$$= \frac{5}{2}ade\sqrt{d+ex^2}+\frac{5}{6}ae\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{2x^2}+b\int \frac{\left(d+ex^2\right)^{5/2}\text{ta}}{x^3}$$

$$= \frac{5}{2}ade\sqrt{d+ex^2}+\frac{5}{6}ae\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{2x^2}+b\int \frac{\left(d+ex^2\right)^{5/2}\text{ta}}{x^3}$$

$$= \frac{5}{2}ade\sqrt{d+ex^2}+\frac{5}{6}ae\left(d+ex^2\right)^{3/2}-\frac{a\left(d+ex^2\right)^{5/2}}{2x^2}-\frac{5}{2}ad^{3/2}e\tanh^{-1}\left(\sqrt{\right.$$

Mathematica [A] time = 55.47, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^3}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^3,x]
```

```
[Out] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^3, x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arctan\left(cx\right)\right)\sqrt{ex^2 + d}}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^3,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))*sqrt(e*x^2 + d)/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2 + d\right)^{\frac{5}{2}} \left(a + b\arctan\left(cx\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^3,x)
```

```
[Out] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^3,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^3,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d zero or nonzero?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a + b\,\mathrm{atan}\left(c\,x\right)\right)\,\left(e\,x^2 + d\right)^{5/2}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x^3,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x^3, x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))\left(d + ex^2\right)^{\frac{5}{2}}}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(5/2)*(a+b*atan(c*x))/x**3,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(5/2)/x**3, x)
```

3.1200 $\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$

Optimal. Leaf size=114

$$b\text{Int}\left(\frac{\tan^{-1}(cx)\left(d+ex^2\right)^{5/2}}{x^4},x\right)+\frac{5}{2}ade^{3/2}\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)+\frac{5}{2}ae^2x\sqrt{d+ex^2}-\frac{5ae\left(d+ex^2\right)^{3/2}}{3x}-\frac{a\left(d+ex^2\right)^{5/2}}{3x^3}$$

```
[Out] -5/3*a*e*(e*x^2+d)^(3/2)/x-1/3*a*(e*x^2+d)^(5/2)/x^3+5/2*a*d*e^(3/2)*arctan
h(x*e^(1/2)/(e*x^2+d)^(1/2))+5/2*a*e^2*x*(e*x^2+d)^(1/2)+b*Unintegrable((e*
x^2+d)^(5/2)*arctan(c*x)/x^4,x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] (5*a*e^2*x*Sqrt[d + e*x^2])/2 - (5*a*e*(d + e*x^2)^(3/2))/(3*x) - (a*(d + e
*x^2)^(5/2))/(3*x^3) + (5*a*d*e^(3/2)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])
/2 + b*Defer[Int][((d + e*x^2)^(5/2)*ArcTan[c*x])/x^4, x]
```

Rubi steps

$$\begin{aligned}
\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx &= a\int \frac{\left(d+ex^2\right)^{5/2}}{x^4}\,dx+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^4}\,dx\\
&= -\frac{a\left(d+ex^2\right)^{5/2}}{3x^3}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^4}\,dx+\frac{1}{3}(5ae)\int \frac{\left(d+ex^2\right)^{3/2}}{x^2}\,d\\
&= -\frac{5ae\left(d+ex^2\right)^{3/2}}{3x}-\frac{a\left(d+ex^2\right)^{5/2}}{3x^3}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)}{x^4}\,dx+\left(5ae^2\right.\\
&= \frac{5}{2}ae^2x\sqrt{d+ex^2}-\frac{5ae\left(d+ex^2\right)^{3/2}}{3x}-\frac{a\left(d+ex^2\right)^{5/2}}{3x^3}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan}{x^4}\\
&= \frac{5}{2}ae^2x\sqrt{d+ex^2}-\frac{5ae\left(d+ex^2\right)^{3/2}}{3x}-\frac{a\left(d+ex^2\right)^{5/2}}{3x^3}+b\int \frac{\left(d+ex^2\right)^{5/2}\tan}{x^4}\\
&= \frac{5}{2}ae^2x\sqrt{d+ex^2}-\frac{5ae\left(d+ex^2\right)^{3/2}}{3x}-\frac{a\left(d+ex^2\right)^{5/2}}{3x^3}+\frac{5}{2}ade^{3/2}\tanh^{-1}\left(\frac{\sqrt{}}{\sqrt{d}}\right.
\end{aligned}$$

Mathematica [A] time = 9.55, size = 0, normalized size = 0.00

$$\int \frac{\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)}{x^4}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^4,x]
```

```
[Out] Integrate[((d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]))/x^4, x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(ae^2x^4 + 2\,adex^2 + ad^2 + \left(be^2x^4 + 2\,bdex^2 + bd^2\right)\arctan\left(cx\right)\right)\sqrt{ex^2 + d}}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^4,x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))*sqrt(e*x^2 + d)/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.08, size = 0, normalized size = 0.00

$$\int \frac{\left(e\,x^2 + d\right)^{\frac{5}{2}} \left(a + b\arctan\left(cx\right)\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^4,x)
```

```
[Out] int((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^4,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^(5/2)*(a+b*arctan(c*x))/x^4,x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a + b\,\mathrm{atan}\left(c\,x\right)\right)\,\left(e\,x^2 + d\right)^{5/2}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x^4,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^(5/2))/x^4, x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b\,\mathrm{atan}\left(cx\right)\right)\left(d + ex^2\right)^{\frac{5}{2}}}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**(5/2)*(a+b*atan(c*x))/x**4,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*x**2)**(5/2)/x**4, x)
```

3.1201 $\int \frac{x^3(a+b\tan^{-1}(cx))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=176

$$\frac{(d+ex^2)^{3/2}(a+b\tan^{-1}(cx))}{3e^2}-\frac{d\sqrt{d+ex^2}\,(a+b\tan^{-1}(cx))}{e^2}+\frac{b(3c^2d+2e)\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{6c^3e^{3/2}}+\frac{b\sqrt{c^2d-e}\,(2c^2d+}{3c^3}$$

```
[Out] 1/3*(e*x^2+d)^(3/2)*(a+b*arctan(c*x))/e^2+1/6*b*(3*c^2*d+2*e)*arctanh(x*e^(
1/2)/(e*x^2+d)^(1/2))/c^3/e^(3/2)+1/3*b*(2*c^2*d+e)*arctan(x*(c^2*d-e)^(1/2
)/(e*x^2+d)^(1/2))*(c^2*d-e)^(1/2)/c^3/e^2-1/6*b*x*(e*x^2+d)^(1/2)/c/e-d*(a
+b*arctan(c*x))*(e*x^2+d)^(1/2)/e^2
```

Rubi [A] time = 0.25, antiderivative size = 176, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {266, 43, 4976, 12, 528, 523, 217, 206, 377, 203}

$$\frac{(d+ex^2)^{3/2}(a+b\tan^{-1}(cx))}{3e^2}-\frac{d\sqrt{d+ex^2}\,(a+b\tan^{-1}(cx))}{e^2}+\frac{b\sqrt{c^2d-e}\,(2c^2d+e)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{3c^3e^2}+\frac{b(3c^2d+2e}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] -(b*x*Sqrt[d + e*x^2])/(6*c*e) - (d*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/e^
2 + ((d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]))/(3*e^2) + (b*Sqrt[c^2*d - e]*(2
*c^2*d + e)*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(3*c^3*e^2) + (b*(
3*c^2*d + 2*e)*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(6*c^3*e^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] && !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] && !GtQ[a, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 528

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (
f_.)*(x_)^(n_)), x_Symbol] :> Simp[(f*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^q)/
(b*(n*(p + q + 1) + 1)), x] + Dist[1/(b*(n*(p + q + 1) + 1)), Int[(a + b*x^
n)^p*(c + d*x^n)^(q - 1)*Simp[c*(b*e - a*f + b*e*n*(p + q + 1)) + (d*(b*e -
 a*f) + f*n*q*(b*c - a*d) + b*d*e*n*(p + q + 1))*x^n, x], x], x] /; FreeQ[{
a, b, c, d, e, f, n, p}, x] && GtQ[q, 0] && NeQ[n*(p + q + 1) + 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{x^3 \left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx = -\frac{d\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2} - (bc)\int \frac{\left(-2d+ex^2\right.}{3e^2\left(1\right.}$$

$$= -\frac{d\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2} - \frac{(bc)\int \frac{\left(-2d+ex^2\right)\sqrt{d+}}{1+c^2x^2}}{3e^2}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6ce} - \frac{d\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2} - \frac{b\int}{}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6ce} - \frac{d\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2} + \frac{(b}{}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6ce} - \frac{d\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2} + \frac{(b}{}$$

$$= -\frac{bx\sqrt{d+ex^2}}{6ce} - \frac{d\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2} + \frac{\left(d+ex^2\right)^{3/2}\left(a+b\tan^{-1}(cx)\right)}{3e^2} + \frac{b\sqrt{}}{}$$

Mathematica [C] time = 0.52, size = 377, normalized size = 2.14

$$\frac{-\frac{\sqrt{d+ex^2}\left(ac\left(4d-2ex^2\right)+bex\right)}{c} + \frac{b\sqrt{e}\left(3c^2d+2e\right)\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{c^3} - \frac{ib\left(2c^4d^2-c^2de-e^2\right)\log\left(\frac{12ic^4e^2\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)\sqrt{c^2d-e}\left(-2c^4d^2+c^2de+e^2\right)}\right)}{c^3\sqrt{c^2d-e}} + \frac{ib\left(2c^4d^2-c^2de-e^2\right.}{}}{6e^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] (-((Sqrt[d + e*x^2]*(b*e*x + a*c*(4*d - 2*e*x^2)))/c) + 2*b*(-2*d + e*x^2)*
Sqrt[d + e*x^2]*ArcTan[c*x] - (I*b*(2*c^4*d^2 - c^2*d*e - e^2)*Log[((12*I)*
c^4*e^2*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]
*(-2*c^4*d^2 + c^2*d*e + e^2)*(I + c*x))])/(c^3*Sqrt[c^2*d - e]) + (I*b*(2*
c^4*d^2 - c^2*d*e - e^2)*Log[((-12*I)*c^4*e^2*(c*d + I*e*x + Sqrt[c^2*d - e
]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*(-2*c^4*d^2 + c^2*d*e + e^2)*(-I + c
*x))])/(c^3*Sqrt[c^2*d - e]) + (b*Sqrt[e]*(3*c^2*d + 2*e)*Log[e*x + Sqrt[e]
*Sqrt[d + e*x^2]])/c^3)/(6*e^2)
```

fricas [A] time = 1.34, size = 882, normalized size = 5.01

$$\left[\frac{\left(3\,bc^2d+2\,be\right)\sqrt{e}\,\log\left(-2\,ex^2-2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)+\left(2\,bc^2d+be\right)\sqrt{-c^2d+e}\,\log\left(\frac{\left(c^4d^2-8\,c^2de+8\,e^2\right)x^4-2\left(3\,c^2d^2-4\,\right.}{c}\right.}{12\,c}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/12*((3*b*c^2*d + 2*b*e)*sqrt(e)*log(-2*e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(e)
*x - d) + (2*b*c^2*d + b*e)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*
e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 + 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^
2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 2*(2*a*c^3*e*x
^2 - 4*a*c^3*d - b*c^2*e*x + 2*(b*c^3*e*x^2 - 2*b*c^3*d)*arctan(c*x))*sqrt(
e*x^2 + d))/(c^3*e^2), 1/12*(2*(2*b*c^2*d + b*e)*sqrt(c^2*d - e)*arctan(1/2
*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x
```

```
^3 + (c^2*d^2 - d*e)*x)) + (3*b*c^2*d + 2*b*e)*sqrt(e)*log(-2*e*x^2 - 2*sqr
t(e*x^2 + d)*sqrt(e)*x - d) + 2*(2*a*c^3*e*x^2 - 4*a*c^3*d - b*c^2*e*x + 2*
(b*c^3*e*x^2 - 2*b*c^3*d)*arctan(c*x))*sqrt(e*x^2 + d))/(c^3*e^2), -1/12*(2
*(3*b*c^2*d + 2*b*e)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - (2*b*c^2
*d + b*e)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^
2*d^2 - 4*d*e)*x^2 + 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^
2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 2*(2*a*c^3*e*x^2 - 4*a*c^3*d - b
*c^2*e*x + 2*(b*c^3*e*x^2 - 2*b*c^3*d)*arctan(c*x))*sqrt(e*x^2 + d))/(c^3*e
^2), 1/6*((2*b*c^2*d + b*e)*sqrt(c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^
2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*
x)) - (3*b*c^2*d + 2*b*e)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (2*
a*c^3*e*x^2 - 4*a*c^3*d - b*c^2*e*x + 2*(b*c^3*e*x^2 - 2*b*c^3*d)*arctan(c*
x))*sqrt(e*x^2 + d))/(c^3*e^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 1.22, size = 0, normalized size = 0.00

$$\int \frac{x^3 (a + b \arctan (cx))}{\sqrt{e x^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
[Out] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\left(\frac{\sqrt{ex^2 + d}\, x^2}{e} - \frac{2\sqrt{ex^2 + d}\, d}{e^2}\right)a + b\int \frac{x^3 \arctan (cx)}{\sqrt{ex^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] 1/3*(sqrt(e*x^2 + d)*x^2/e - 2*sqrt(e*x^2 + d)*d/e^2)*a + b*integrate(x^3*a
rctan(c*x)/sqrt(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\, (a + b\, \mathrm{atan}\,(c\, x))}{\sqrt{e\, x^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^(1/2),x)
[Out] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 (a + b\, \mathrm{atan}\,(cx))}{\sqrt{d + ex^2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))/sqrt(d + e*x**2), x)
```

3.1202 $\int \frac{x^2(a+b\tan^{-1}(cx))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=75

$$b\mathrm{Int}\left(\frac{x^2\tan^{-1}(cx)}{\sqrt{d+ex^2}},x\right)-\frac{ad\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{2e^{3/2}}+\frac{ax\sqrt{d+ex^2}}{2e}$$

```
[Out] -1/2*a*d*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(3/2)+1/2*a*x*(e*x^2+d)^(1/2)
/e+b*Unintegrable(x^2*arctan(c*x)/(e*x^2+d)^(1/2),x)
```

Rubi [A] time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] (a*x*Sqrt[d + e*x^2])/(2*e) - (a*d*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(2
*e^(3/2)) + b*Defer[Int][(x^2*ArcTan[c*x])/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx &= a\int \frac{x^2}{\sqrt{d+ex^2}}\,dx+b\int \frac{x^2\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx\\
&= \frac{ax\sqrt{d+ex^2}}{2e}+b\int \frac{x^2\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx-\frac{(ad)\int \frac{1}{\sqrt{d+ex^2}}\,dx}{2e}\\
&= \frac{ax\sqrt{d+ex^2}}{2e}+b\int \frac{x^2\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx-\frac{(ad)\,\mathrm{Subst}\left(\int \frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{2e}\\
&= \frac{ax\sqrt{d+ex^2}}{2e}-\frac{ad\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{2e^{3/2}}+b\int \frac{x^2\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx
\end{aligned}$$

Mathematica [A] time = 9.38, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] Integrate[(x^2*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2], x]
```

fricas [A] time = 0.46, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bx^2\arctan(cx)+ax^2}{\sqrt{ex^2+d}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral((b*x^2*arctan(c*x) + a*x^2)/sqrt(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.16, size = 0, normalized size = 0.00

$$\int \frac{x^2 (a + b \arctan (cx))}{\sqrt{e x^2 + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
[Out] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\ (a + b \operatorname{atan}(c\,x))}{\sqrt{e\,x^2 + d}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^(1/2),x)
[Out] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 (a + b \operatorname{atan}(cx))}{\sqrt{d + ex^2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(e*x**2+d)**(1/2),x)
[Out] Integral(x**2*(a + b*atan(c*x))/sqrt(d + e*x**2), x)
```

3.1203 $\int \frac{x(a+b\tan^{-1}(cx))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=103

$$\frac{\sqrt{d+ex^2}\,\left(a+b\tan^{-1}(cx)\right)}{e}-\frac{b\sqrt{c^2d-e}\,\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{ce}-\frac{b\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{c\sqrt{e}}$$

```
[Out] -b*arctan(x*(c^2*d-e)^(1/2)/(e*x^2+d)^(1/2))*(c^2*d-e)^(1/2)/c/e-b*arctanh(
x*e^(1/2)/(e*x^2+d)^(1/2))/c/e^(1/2)+(a+b*arctan(c*x))*(e*x^2+d)^(1/2)/e
```

Rubi [A] time = 0.10, antiderivative size = 103, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.286, Rules used = {4974, 402, 217, 206, 377, 203}

$$\frac{\sqrt{d+ex^2}\,\left(a+b\tan^{-1}(cx)\right)}{e}-\frac{b\sqrt{c^2d-e}\,\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{ce}-\frac{b\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{c\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] (Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/e - (b*Sqrt[c^2*d - e]*ArcTan[(Sqrt[c
^2*d - e]*x)/Sqrt[d + e*x^2]])/(c*e) - (b*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^
2]])/(c*Sqrt[e])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 402

```
Int[((a_) + (b_.)*(x_)^2)^(p_.)/((c_) + (d_.)*(x_)^2), x_Symbol] :> Dist[b/
d, Int[(a + b*x^2)^(p - 1), x], x] - Dist[(b*c - a*d)/d, Int[(a + b*x^2)^(p
 - 1)/(c + d*x^2), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] &&
 GtQ[p, 0] && (EqQ[p, 1/2] || EqQ[Denominator[p], 4])
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx = \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e} - \frac{(bc)\int \frac{\sqrt{d+ex^2}}{1+c^2x^2}\,dx}{e}$$

$$= \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e} - \frac{b\int \frac{1}{\sqrt{d+ex^2}}\,dx}{c} + \frac{\left(b\left(-c^2d+e\right)\right)\int \frac{1}{\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,dx}{ce}$$

$$= \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e} - \frac{b\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx, x, \frac{x}{\sqrt{d+ex^2}}\right)}{c} + \frac{\left(b\left(-c^2d+e\right)\right)\text{Subst}}{}$$

$$= \frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e} - \frac{b\sqrt{c^2d-e}\,\tan^{-1}\left(\frac{\sqrt{c^2d-e}\,x}{\sqrt{d+ex^2}}\right)}{ce} - \frac{b\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{c\sqrt{e}}$$

Mathematica [C] time = 0.41, size = 251, normalized size = 2.44

$$\frac{2ac\sqrt{d+ex^2} - ib\sqrt{c^2d-e}\,\log\left(\frac{4c^2e\left(-i\sqrt{c^2d-e}\,\sqrt{d+ex^2}-icd+ex\right)}{b(cx-i)\left(c^2d-e\right)^{3/2}}\right) + ib\sqrt{c^2d-e}\,\log\left(\frac{4c^2e\left(i\sqrt{c^2d-e}\,\sqrt{d+ex^2}+icd+ex\right)}{b(cx+i)\left(c^2d-e\right)^{3/2}}\right) + 2bc\tan}{2ce}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] (2*a*c*Sqrt[d + e*x^2] + 2*b*c*Sqrt[d + e*x^2]*ArcTan[c*x] - I*b*Sqrt[c^2*d
 - e]*Log[(4*c^2*e*((-I)*c*d + e*x - I*Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b
*(c^2*d - e)^(3/2)*(-I + c*x))] + I*b*Sqrt[c^2*d - e]*Log[(4*c^2*e*(I*c*d +
 e*x + I*Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(3/2)*(I + c*x))]
 - 2*b*Sqrt[e]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/(2*c*e)
```

fricas [A] time = 0.67, size = 647, normalized size = 6.28

$$\left[\frac{2\,b\sqrt{e}\,\log\left(-2\,ex^2+2\,\sqrt{ex^2+d}\,\sqrt{e}\,x-d\right)+\sqrt{-c^2d+e}\,b\log\left(\frac{\left(c^4d^2-8\,c^2de+8\,e^2\right)x^4-2\left(3\,c^2d^2-4\,de\right)x^2-4\left(\left(c^2d-2\,e\right)x^3-dx\right)\sqrt{-c^2d}}{c^4x^4+2\,c^2x^2+1}\right.}{4\,ce}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/4*(2*b*sqrt(e)*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) + sqrt(-c
^2*d + e)*b*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*
x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(
c^4*x^4 + 2*c^2*x^2 + 1)) + 4*sqrt(e*x^2 + d)*(b*c*arctan(c*x) + a*c))/(c*e
), -1/2*(sqrt(c^2*d - e)*b*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 -
d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) - b*sqrt(e)*l
og(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) - 2*sqrt(e*x^2 + d)*(b*c*arc
tan(c*x) + a*c))/(c*e), 1/4*(4*b*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)
) + sqrt(-c^2*d + e)*b*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^
```

```
2 - 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 +
d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 4*sqrt(e*x^2 + d)*(b*c*arctan(c*x) +
 a*c))/(c*e), -1/2*(sqrt(c^2*d - e)*b*arctan(1/2*sqrt(c^2*d - e)*((c^2*d -
2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) -
2*b*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) - 2*sqrt(e*x^2 + d)*(b*c*ar
ctan(c*x) + a*c))/(c*e)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.06, size = 0, normalized size = 0.00

$$\int \frac{x\,(a+b\arctan\,(cx))}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

```
[Out] int(x*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d zero or nonzero?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + e*x^2)^(1/2),x)
```

```
[Out] int((x*(a + b*atan(c*x)))/(d + e*x^2)^(1/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(cx))}{\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral(x*(a + b*atan(c*x))/sqrt(d + e*x**2), x)
```

3.1204 $\int \frac{a+b\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=23

$$\operatorname{Int}\left(\frac{a+b\tan^{-1}(cx)}{\sqrt{d+ex^2}},x\right)$$

```
[Out] Unintegrable((a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

Rubi [A] time = 0.02, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcTan[c*x])/Sqrt[d + e*x^2],x]
[Out] Defer[Int][(a + b*ArcTan[c*x])/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx=\int \frac{a+b\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$$

Mathematica [A] time = 3.66, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])/Sqrt[d + e*x^2],x]
[Out] Integrate[(a + b*ArcTan[c*x])/Sqrt[d + e*x^2], x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(\frac{b\arctan(cx)+a}{\sqrt{ex^2+d}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral((b*arctan(c*x) + a)/sqrt(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 2.13, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan\left(cx\right)}{\sqrt{e\,x^{2}+d}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\arctan\left(cx\right)}{\sqrt{ex^{2}+d}}\,dx+\frac{a\,\mathrm{arsinh}\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{e}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] b*integrate(arctan(c*x)/sqrt(e*x^2 + d), x) + a*arcsinh(e*x/sqrt(d*e))/sqrt
(e)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.04

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{\sqrt{e\,x^2+d}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + e*x^2)^(1/2),x)
```

```
[Out] int((a + b*atan(c*x))/(d + e*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\,\mathrm{atan}\left(cx\right)}{\sqrt{d+ex^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*atan(c*x))/sqrt(d + e*x**2), x)
```

3.1205 $\int \frac{a+b\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=51

$$b\text{Int}\left(\frac{\tan^{-1}(cx)}{x\sqrt{d+ex^2}},x\right)-\frac{a\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}}$$

```
[Out] -a*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(1/2)+b*Unintegrable(arctan(c*x)/x/(e
*x^2+d)^(1/2),x)
```

Rubi [A] time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcTan[c*x])/(x*Sqrt[d + e*x^2]),x]
```

```
[Out] -((a*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/Sqrt[d]) + b*Defer[Int][ArcTan[c*x]/
(x*Sqrt[d + e*x^2]), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx &= a\int \frac{1}{x\sqrt{d+ex^2}}\,dx+b\int \frac{\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)+b\int \frac{\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx\\
&= b\int \frac{\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{e}\\
&= -\frac{a\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}}+b\int \frac{\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx
\end{aligned}$$

Mathematica [A] time = 5.78, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan^{-1}(cx)}{x\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*Sqrt[d + e*x^2]),x]
```

```
[Out] Integrate[(a + b*ArcTan[c*x])/(x*Sqrt[d + e*x^2]), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{ex^3+dx},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/(e*x^3 + d*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.14, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan(cx)}{x\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(e*x^2+d)^(1/2),x)
[Out] int((a+b*arctan(c*x))/x/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\arctan(cx)}{\sqrt{ex^2+d}\,x}\,dx - \frac{a\,\mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{\sqrt{d}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] b*integrate(arctan(c*x)/(sqrt(e*x^2 + d)*x), x) - a*arcsinh(d/(sqrt(d*e)*ab
s(x)))/sqrt(d)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{a+b\,\mathrm{atan}(c\,x)}{x\,\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + e*x^2)^(1/2)),x)
[Out] int((a + b*atan(c*x))/(x*(d + e*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\,\mathrm{atan}(cx)}{x\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(e*x**2+d)**(1/2),x)
[Out] Integral((a + b*atan(c*x))/(x*sqrt(d + e*x**2)), x)
```

3.1206 $\int \frac{a+b\tan^{-1}(cx)}{x^2\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=100

$$-\frac{\sqrt{d+ex^2}\,\left(a+b\tan^{-1}(cx)\right)}{dx}+\frac{b\sqrt{c^2d-e}\,\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}}$$

```
[Out] -b*c*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(1/2)+b*arctanh(c*(e*x^2+d)^(1/2)/(
c^2*d-e)^(1/2))*(c^2*d-e)^(1/2)/d-(a+b*arctan(c*x))*(e*x^2+d)^(1/2)/d/x
```

Rubi [A] time = 0.18, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {264, 4976, 446, 83, 63, 208}

$$-\frac{\sqrt{d+ex^2}\,\left(a+b\tan^{-1}(cx)\right)}{dx}+\frac{b\sqrt{c^2d-e}\,\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*Sqrt[d + e*x^2]),x]
```

```
[Out] -((Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/(d*x)) - (b*c*ArcTanh[Sqrt[d + e*x^
2]/Sqrt[d]])/Sqrt[d] + (b*Sqrt[c^2*d - e]*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[
c^2*d - e]])/d
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 83

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Dist[(b*e - a*f)/(b*c - a*d), Int[(e + f*x)^(p - 1)/(a + b*x)
, x], x] - Dist[(d*e - c*f)/(b*c - a*d), Int[(e + f*x)^(p - 1)/(c + d*x), x
], x] /; FreeQ[{a, b, c, d, e, f}, x] && LtQ[0, p, 1]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
```

```
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] && !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] && !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] && !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2\sqrt{d+ex^2}}\,dx = -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{dx}-(bc)\int \frac{\sqrt{d+ex^2}}{x\left(-d-c^2dx^2\right)}\,dx$$
$$= -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{\sqrt{d+ex}}{x\left(-d-c^2dx\right)}\,dx,x,x^2\right)$$
$$= -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{dx}+\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)+\frac{1}{2}\left(bc\left(c^2d-e\right)\right.$$
$$= -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{dx}+\frac{(bc)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{e}+\frac{\left(bc\left(c^2d-e\right)\right)}{}$$
$$= -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{dx}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{\sqrt{d}}+\frac{b\sqrt{c^2d-e}\,\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d}$$

Mathematica [C] time = 0.45, size = 247, normalized size = 2.47

$$\frac{-2a\sqrt{d+ex^2}+bx\sqrt{c^2d-e}\log\left(-\frac{4cd\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)\left(c^2d-e\right)^{3/2}}\right)+bx\sqrt{c^2d-e}\log\left(-\frac{4cd\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd+iex\right)}{b(cx-i)\left(c^2d-e\right)^{3/2}}\right)-2b}{2dx}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*Sqrt[d + e*x^2]),x]
```

```
[Out] (-2*a*Sqrt[d + e*x^2] - 2*b*Sqrt[d + e*x^2]*ArcTan[c*x] + 2*b*c*Sqrt[d]*x*L
og[x] - 2*b*c*Sqrt[d]*x*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] + b*Sqrt[c^2*d - e
]*x*Log[(-4*c*d*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d
- e)^(3/2)*(I + c*x))] + b*Sqrt[c^2*d - e]*x*Log[(-4*c*d*(c*d + I*e*x + Sqr
t[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - e)^(3/2)*(-I + c*x))])/(2*d*x)
```

fricas [A] time = 0.53, size = 660, normalized size = 6.60

$$\left[\frac{2bc\sqrt{d}\,x\log\left(-\frac{ex^2-2\sqrt{ex^2+d}\sqrt{d}+2d}{x^2}\right)+\sqrt{c^2d-e}\,bx\log\left(\frac{c^4e^2x^4+8c^4d^2-8c^2de+2\left(4c^4de-3c^2e^2\right)x^2+4\left(c^3ex^2+2c^3d-ce\right)\sqrt{c^2d-e}\sqrt{}}{c^4x^4+2c^2x^2+1}\right.}{4dx}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/4*(2*b*c*sqrt(d)*x*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) +
 sqrt(c^2*d - e)*b*x*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*
e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x
^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 4*sqrt(e*x^2 + d)*(b*arctan(c*x
) + a))/(d*x), 1/2*(b*c*sqrt(d)*x*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) +
 2*d)/x^2) + sqrt(-c^2*d + e)*b*x*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqr
t(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) -
2*sqrt(e*x^2 + d)*(b*arctan(c*x) + a))/(d*x), 1/4*(4*b*c*sqrt(-d)*x*arctan(
sqrt(-d)/sqrt(e*x^2 + d)) + sqrt(c^2*d - e)*b*x*log((c^4*e^2*x^4 + 8*c^4*d^
2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*
e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 4*sq
rt(e*x^2 + d)*(b*arctan(c*x) + a))/(d*x), 1/2*(2*b*c*sqrt(-d)*x*arctan(sqrt
(-d)/sqrt(e*x^2 + d)) + sqrt(-c^2*d + e)*b*x*arctan(-1/2*(c^2*e*x^2 + 2*c^2
*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^
2)*x^2)) - 2*sqrt(e*x^2 + d)*(b*arctan(c*x) + a))/(d*x)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.21, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan(cx)}{x^2\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^(1/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^2\,\sqrt{e\,x^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^(1/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\,\mathrm{atan}(cx)}{x^2\sqrt{d+ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x**2*sqrt(d + e*x**2)), x)
```

3.1207 $\int \frac{a+b\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=76

$$b\text{Int}\left(\frac{\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}},x\right)+\frac{ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2d^{3/2}}-\frac{a\sqrt{d+ex^2}}{2dx^2}$$

[Out] 1/2*a*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)-1/2*a*(e*x^2+d)^(1/2)/d/x^2+b*Unintegrable(arctan(c*x)/x^3/(e*x^2+d)^(1/2),x)

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

[In] Int[(a + b*ArcTan[c*x])/(x^3*Sqrt[d + e*x^2]),x]

[Out] -(a*Sqrt[d + e*x^2])/(2*d*x^2) + (a*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(2*d^(3/2)) + b*Defer[Int][ArcTan[c*x]/(x^3*Sqrt[d + e*x^2]), x]

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx &= a\int \frac{1}{x^3\sqrt{d+ex^2}}\,dx+b\int \frac{\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{d+ex}}\,dx,x,x^2\right)+b\int \frac{\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx\\
&= -\frac{a\sqrt{d+ex^2}}{2dx^2}+b\int \frac{\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx-\frac{(ae)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{4d}\\
&= -\frac{a\sqrt{d+ex^2}}{2dx^2}+b\int \frac{\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx-\frac{a\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{2d}\\
&= -\frac{a\sqrt{d+ex^2}}{2dx^2}+\frac{ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2d^{3/2}}+b\int \frac{\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx
\end{aligned}$$

Mathematica [A] time = 57.96, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(a + b*ArcTan[c*x])/(x^3*Sqrt[d + e*x^2]),x]

[Out] Integrate[(a + b*ArcTan[c*x])/(x^3*Sqrt[d + e*x^2]), x]

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{ex^5+dx^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(1/2),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/(e*x^5 + d*x^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.15, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan\left(cx\right)}{x^{3}\sqrt{e\,x^{2}+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^(1/2),x)
[Out] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{e\,\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{3}{2}}}-\frac{\sqrt{ex^{2}+d}}{dx^{2}}\right)+b\int \frac{\arctan\left(cx\right)}{\sqrt{ex^{2}+d}\,x^{3}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] 1/2*a*(e*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(3/2) - sqrt(e*x^2 + d)/(d*x^2)) +
 b*integrate(arctan(c*x)/(sqrt(e*x^2 + d)*x^3), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^3\,\sqrt{e\,x^2+d}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^(1/2)),x)
[Out] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^(1/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\operatorname{atan}{\left(cx \right)}}{x^{3}\sqrt{d+ex^{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(e*x**2+d)**(1/2),x)
[Out] Integral((a + b*atan(c*x))/(x**3*sqrt(d + e*x**2)), x)
```

3.1208 $\int \frac{a+b\tan^{-1}(cx)}{x^4\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=179

$$\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}-\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{bc\left(2c^2d+3e\right)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{6d^{3/2}}-\frac{b\sqrt{c^2d-e}\left(c^2d+2\right.}{3}$$

```
[Out] 1/6*b*c*(2*c^2*d+3*e)*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)-1/3*b*(c^2*d
+2*e)*arctanh(c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))*(c^2*d-e)^(1/2)/d^2-1/6*b*
c*(e*x^2+d)^(1/2)/d/x^2-1/3*(a+b*arctan(c*x))*(e*x^2+d)^(1/2)/d/x^3+2/3*e*(
a+b*arctan(c*x))*(e*x^2+d)^(1/2)/d^2/x
```

Rubi [A] time = 0.27, antiderivative size = 179, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.391$, Rules used = {271, 264, 4976, 12, 573, 149, 156, 63, 208}

$$\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}-\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{bc\left(2c^2d+3e\right)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{6d^{3/2}}-\frac{b\sqrt{c^2d-e}\left(c^2d+2\right.}{3}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^4*Sqrt[d + e*x^2]),x]
```

```
[Out] -(b*c*Sqrt[d + e*x^2])/(6*d*x^2) - (Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/(3
*d*x^3) + (2*e*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]))/(3*d^2*x) + (b*c*(2*c^2
*d + 3*e)*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(6*d^(3/2)) - (b*Sqrt[c^2*d - e
]*(c^2*d + 2*e)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(3*d^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 149

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_)*((e_.) + (f_.)*(x_)
)^(p_)*((g_.) + (h_.)*(x_)), x_Symbol] :> Simp[((b*g - a*h)*(a + b*x)^(m +
1)*(c + d*x)^n*(e + f*x)^(p + 1))/(b*(b*e - a*f)*(m + 1)), x] - Dist[1/(b*(
b*e - a*f)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^(n - 1)*(e + f*x)^p*Si
mp[b*c*(f*g - e*h)*(m + 1) + (b*g - a*h)*(d*e*n + c*f*(p + 1)) + d*(b*(f*g
- e*h)*(m + 1) + f*(b*g - a*h)*(n + p + 1))*x, x], x], x] /; FreeQ[{a, b, c
, d, e, f, g, h, p}, x] && LtQ[m, -1] && GtQ[n, 0] && IntegerQ[m]
```

Rule 156

```
Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*
((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e +
f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c
 + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 573

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simpl
ify[(m + 1)/n] - 1)*(a + b*x)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /;
 FreeQ[{a, b, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[Simplify[(m + 1)/n
]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^4\sqrt{d+ex^2}}\,dx = -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}-(bc)\int \frac{\sqrt{d+ex^2}\,(-d+\cdots}{3d^2x^3\left(1+c^2x\cdots\right.}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}-\frac{(bc)\int \frac{\sqrt{d+ex^2}\left(-d+2ex^2\right)}{x^3\left(1+c^2x^2\right)}\,dx\cdots}{3d^2}$$

$$= -\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}-\frac{(bc)\,\mathrm{Subst}\left(\int \frac{\sqrt{d+ex}\,(-d+\cdots}{x^2\left(1+c^2x\cdots\right.}\right.}{6d^2}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6dx^2}-\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}-\frac{(bc)\,\mathrm{Subs}\cdots}{\cdots}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6dx^2}-\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}+\frac{\left(bc\left(c^2d\cdots\right.\right.}{\cdots}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6dx^2}-\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}+\frac{\left(bc\left(c^2d\cdots\right.\right.}{\cdots}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6dx^2}-\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3dx^3}+\frac{2e\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{3d^2x}+\frac{bc\left(2c^2d\cdots\right.}{\cdots}$$

Mathematica [C] time = 0.53, size = 372, normalized size = 2.08

$$-\frac{\frac{\sqrt{d+ex^2}\left(2a\left(d-2ex^2\right)+bcdx\right)}{x^3}-bc\sqrt{d}\left(2c^2d+3e\right)\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)+bc\sqrt{d}\log(x)\left(2c^2d+3e\right)+\frac{b\left(c^4d^2+c^2de-2e^2\right)\log\cdots}{\cdots}}{6d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^4*Sqrt[d + e*x^2]),x]
```

```
[Out] -1/6*((Sqrt[d + e*x^2]*(b*c*d*x + 2*a*(d - 2*e*x^2)))/x^3 + (2*b*(d - 2*e*x
^2)*Sqrt[d + e*x^2]*ArcTan[c*x])/x^3 + b*c*Sqrt[d]*(2*c^2*d + 3*e)*Log[x] -
 b*c*Sqrt[d]*(2*c^2*d + 3*e)*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] + (b*(c^4*d^2
 + c^2*d*e - 2*e^2)*Log[(12*c*d^2*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e
*x^2]))/(b*Sqrt[c^2*d - e]*(c^4*d^2 + c^2*d*e - 2*e^2)*(I + c*x))])/Sqrt[c^
2*d - e] + (b*(c^4*d^2 + c^2*d*e - 2*e^2)*Log[(12*c*d^2*(c*d + I*e*x + Sqrt
[c^2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*(c^4*d^2 + c^2*d*e - 2*e^2
)*(-I + c*x))])/Sqrt[c^2*d - e])/d^2
```

fricas [A] time = 0.62, size = 868, normalized size = 4.85

$$\left[\frac{\left(bc^2d+2\,be\right)\sqrt{c^2d-e}\,x^3\log\left(\frac{c^4e^2x^4+8\,c^4d^2-8\,c^2de+2\left(4\,c^4de-3\,c^2e^2\right)x^2-4\left(c^3ex^2+2\,c^3d-ce\right)\sqrt{c^2d-e}\,\sqrt{ex^2+d}+e^2}{c^4x^4+2\,c^2x^2+1}\right)+\left(2\,bc^3d+3\,bce\right)\cdots}{12\,d^2x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] [1/12*((b*c^2*d + 2*b*e)*sqrt(c^2*d - e)*x^3*log((c^4*e^2*x^4 + 8*c^4*d^2 -
 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 - 4*(c^3*e*x^2 + 2*c^3*d - c*e)*
```

```
sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + (2*b*c^
3*d + 3*b*c*e)*sqrt(d)*x^3*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x
^2) - 2*(b*c*d*x - 4*a*e*x^2 + 2*a*d - 2*(2*b*e*x^2 - b*d)*arctan(c*x))*sqr
t(e*x^2 + d))/(d^2*x^3), -1/12*(2*(b*c^2*d + 2*b*e)*sqrt(-c^2*d + e)*x^3*ar
ctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d
^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) - (2*b*c^3*d + 3*b*c*e)*sqrt(d)*x^3*lo
g(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*(b*c*d*x - 4*a*e*x^2
+ 2*a*d - 2*(2*b*e*x^2 - b*d)*arctan(c*x))*sqrt(e*x^2 + d))/(d^2*x^3), -1/1
2*(2*(2*b*c^3*d + 3*b*c*e)*sqrt(-d)*x^3*arctan(sqrt(-d)/sqrt(e*x^2 + d)) -
(b*c^2*d + 2*b*e)*sqrt(c^2*d - e)*x^3*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*
d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 - 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^
2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 2*(b*c*d*x - 4
*a*e*x^2 + 2*a*d - 2*(2*b*e*x^2 - b*d)*arctan(c*x))*sqrt(e*x^2 + d))/(d^2*x
^3), -1/6*((b*c^2*d + 2*b*e)*sqrt(-c^2*d + e)*x^3*arctan(-1/2*(c^2*e*x^2 +
2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e -
 c*e^2)*x^2)) + (2*b*c^3*d + 3*b*c*e)*sqrt(-d)*x^3*arctan(sqrt(-d)/sqrt(e*x
^2 + d)) + (b*c*d*x - 4*a*e*x^2 + 2*a*d - 2*(2*b*e*x^2 - b*d)*arctan(c*x))*
sqrt(e*x^2 + d))/(d^2*x^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(1/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.26, size = 0, normalized size = 0.00

$$\int \frac{a + b \arctan(cx)}{x^4 \sqrt{e x^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^4/(e*x^2+d)^(1/2),x)
```

```
[Out] int((a+b*arctan(c*x))/x^4/(e*x^2+d)^(1/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\, a \left(\frac{2\sqrt{ex^2 + d}\, e}{d^2 x} - \frac{\sqrt{ex^2 + d}}{dx^3} \right) + b \int \frac{\arctan(cx)}{\sqrt{ex^2 + d}\, x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(1/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(2*sqrt(e*x^2 + d)*e/(d^2*x) - sqrt(e*x^2 + d)/(d*x^3)) + b*integrate
(arctan(c*x)/(sqrt(e*x^2 + d)*x^4), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b \operatorname{atan}(c\, x)}{x^4\, \sqrt{e\, x^2 + d}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^4*(d + e*x^2)^(1/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^4*(d + e*x^2)^(1/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{atan}(cx)}{x^4 \sqrt{d + ex^2}} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**4/(e*x**2+d)**(1/2),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x**4*sqrt(d + e*x**2)), x)
```

3.1209 $\int \frac{x^3(a+b\tan^{-1}(cx))}{(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=137

$$\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2\sqrt{d+ex^2}}-\frac{b\left(2c^2d-e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{ce^2\sqrt{c^2d-e}}-\frac{b\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{ce^{3/2}}$$

```
[Out] -b*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/c/e^(3/2)-b*(2*c^2*d-e)*arctan(x*(c^2
*d-e)^(1/2)/(e*x^2+d)^(1/2))/c/e^2/(c^2*d-e)^(1/2)+d*(a+b*arctan(c*x))/e^2/
(e*x^2+d)^(1/2)+(a+b*arctan(c*x))*(e*x^2+d)^(1/2)/e^2
```

Rubi [A] time = 0.18, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.391, Rules used = {266, 43, 4976, 12, 523, 217, 206, 377, 203}

$$\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2\sqrt{d+ex^2}}-\frac{b\left(2c^2d-e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{ce^2\sqrt{c^2d-e}}-\frac{b\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{ce^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (d*(a + b*ArcTan[c*x]))/(e^2*Sqrt[d + e*x^2]) + (Sqrt[d + e*x^2]*(a + b*Arc
Tan[c*x]))/e^2 - (b*(2*c^2*d - e)*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2
]])/(c*Sqrt[c^2*d - e]*e^2) - (b*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/(c*e
^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 206

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTanh[(Rt[-b, 2]*x)/
Rt[a, 2]])/(Rt[a, 2]*Rt[-b, 2]), x] /; FreeQ[{a, b}, x] && NegQ[a/b] && (Gt
Q[a, 0] || LtQ[b, 0])
```

Rule 217

```
Int[1/Sqrt[(a_) + (b_.)*(x_)^2], x_Symbol] :> Subst[Int[1/(1 - b*x^2), x],
x, x/Sqrt[a + b*x^2]] /; FreeQ[{a, b}, x] &&  !GtQ[a, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 523

```
Int[((e_) + (f_.)*(x_)^(n_))/(((a_) + (b_.)*(x_)^(n_))*Sqrt[(c_) + (d_.)*(x
_)^(n_)]), x_Symbol] :> Dist[f/b, Int[1/Sqrt[c + d*x^n], x], x] + Dist[(b*e
 - a*f)/b, Int[1/((a + b*x^n)*Sqrt[c + d*x^n]), x], x] /; FreeQ[{a, b, c, d
, e, f, n}, x]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] && !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] && !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] && !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$
\begin{aligned}
\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx &= \frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2}-(bc)\int\frac{2d+ex^2}{e^2\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,d \\
&= \frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2}-\frac{(bc)\int\frac{2d+ex^2}{\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,dx}{e^2} \\
&= \frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2}-\frac{b\int\frac{1}{\sqrt{d+ex^2}}\,dx}{ce}-\frac{\left(bc\left(2d-\frac{e}{c^2}\right)\right)}{} \\
&= \frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2}-\frac{b\,\text{Subst}\left(\int\frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{ce} \\
&= \frac{d\left(a+b\tan^{-1}(cx)\right)}{e^2\sqrt{d+ex^2}}+\frac{\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)}{e^2}-\frac{bc\left(2d-\frac{e}{c^2}\right)\tan^{-1}\left(\frac{\sqrt{c^2d-e}\,x}{\sqrt{d+ex^2}}\right)}{\sqrt{c^2d-e}\,e^2}-
\end{aligned}
$$

Mathematica [C] time = 0.66, size = 321, normalized size = 2.34

$$
\frac{\frac{2a\left(2d+ex^2\right)}{\sqrt{d+ex^2}}-\frac{ib\left(2c^2d-e\right)\log\left(\frac{4c^2e^2\left(-i\sqrt{c^2d-e}\sqrt{d+ex^2}-icd+ex\right)}{b(cx-i)\sqrt{c^2d-e}\left(2c^2d-e\right)}\right)}{c\sqrt{c^2d-e}}+\frac{ib\left(2c^2d-e\right)\log\left(\frac{4c^2e^2\left(i\sqrt{c^2d-e}\sqrt{d+ex^2}+icd+ex\right)}{b(cx+i)\sqrt{c^2d-e}\left(2c^2d-e\right)}\right)}{c\sqrt{c^2d-e}}-\frac{2b\sqrt{e}\log\left(\sqrt{e}\sqrt{d+ex^2}+ex\right)}{c}+\frac{2b}{}}{2e^2}
$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] ((2*a*(2*d + e*x^2))/Sqrt[d + e*x^2] + (2*b*(2*d + e*x^2)*ArcTan[c*x])/Sqrt
[d + e*x^2] - (I*b*(2*c^2*d - e)*Log[(4*c^2*e^2*((-I)*c*d + e*x - I*Sqrt[c^
2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*(2*c^2*d - e)*(-I + c*x))])/(
c*Sqrt[c^2*d - e]) + (I*b*(2*c^2*d - e)*Log[(4*c^2*e^2*(I*c*d + e*x + I*Sqr
t[c^2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*(2*c^2*d - e)*(I + c*x))]
)/(c*Sqrt[c^2*d - e]) - (2*b*Sqrt[e]*Log[e*x + Sqrt[e]*Sqrt[d + e*x^2]])/c)
/(2*e^2)
```

fricas [B] time = 0.89, size = 1291, normalized size = 9.42

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*(2*(b*c^2*d^2 - b*d*e + (b*c^2*d*e - b*e^2)*x^2)*sqrt(e)*log(-2*e*x^2
+ 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) + (2*b*c^2*d^2 - b*d*e + (2*b*c^2*d*e -
b*e^2)*x^2)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*
c^2*d^2 - 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*
x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 4*(2*a*c^3*d^2 - 2*a*c*d*e + (
a*c^3*d*e - a*c*e^2)*x^2 + (2*b*c^3*d^2 - 2*b*c*d*e + (b*c^3*d*e - b*c*e^2)
*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^3*d^2*e^2 - c*d*e^3 + (c^3*d*e^3 - c
*e^4)*x^2), -1/2*((2*b*c^2*d^2 - b*d*e + (2*b*c^2*d*e - b*e^2)*x^2)*sqrt(c^
2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)
/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) - (b*c^2*d^2 - b*d*e + (b*c^2*d
*e - b*e^2)*x^2)*sqrt(e)*log(-2*e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(e)*x - d) -
2*(2*a*c^3*d^2 - 2*a*c*d*e + (a*c^3*d*e - a*c*e^2)*x^2 + (2*b*c^3*d^2 - 2*b
*c*d*e + (b*c^3*d*e - b*c*e^2)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^3*d^2*
e^2 - c*d*e^3 + (c^3*d*e^3 - c*e^4)*x^2), 1/4*(4*(b*c^2*d^2 - b*d*e + (b*c^
2*d*e - b*e^2)*x^2)*sqrt(-e)*arctan(sqrt(-e)*x/sqrt(e*x^2 + d)) + (2*b*c^2*
d^2 - b*d*e + (2*b*c^2*d*e - b*e^2)*x^2)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8
*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 -
d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 4
*(2*a*c^3*d^2 - 2*a*c*d*e + (a*c^3*d*e - a*c*e^2)*x^2 + (2*b*c^3*d^2 - 2*b*
c*d*e + (b*c^3*d*e - b*c*e^2)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^3*d^2*e
^2 - c*d*e^3 + (c^3*d*e^3 - c*e^4)*x^2), -1/2*((2*b*c^2*d^2 - b*d*e + (2*b*
c^2*d*e - b*e^2)*x^2)*sqrt(c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d -
2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) -
2*(b*c^2*d^2 - b*d*e + (b*c^2*d*e - b*e^2)*x^2)*sqrt(-e)*arctan(sqrt(-e)*x/
sqrt(e*x^2 + d)) - 2*(2*a*c^3*d^2 - 2*a*c*d*e + (a*c^3*d*e - a*c*e^2)*x^2 +
 (2*b*c^3*d^2 - 2*b*c*d*e + (b*c^3*d*e - b*c*e^2)*x^2)*arctan(c*x))*sqrt(e*
x^2 + d))/(c^3*d^2*e^2 - c*d*e^3 + (c^3*d*e^3 - c*e^4)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.12, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \left(a +b \arctan \left(c x \right)\right)}{\left(e \,x^{2}+d \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$a\left(\frac{x^2}{\sqrt{ex^2+d}\,e}+\frac{2\,d}{\sqrt{ex^2+d}\,e^2}\right)+2\,b\int\frac{x^3\arctan\left(cx\right)}{2\left(ex^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] a*(x^2/(sqrt(e*x^2 + d)*e) + 2*d/(sqrt(e*x^2 + d)*e^2)) + 2*b*integrate(1/2
*x^3*arctan(c*x)/(e*x^2 + d)^(3/2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{x^3\left(a+b\operatorname{atan}\left(cx\right)\right)}{\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))/(d + e*x**2)**(3/2), x)
```

3.1210 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=69

$$b\text{Int}\left(\frac{x^2\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}},x\right)+\frac{a\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{e^{3/2}}-\frac{ax}{e\sqrt{d+ex^2}}$$

```
[Out] a*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(3/2)-a*x/e/(e*x^2+d)^(1/2)+b*Uninte
grable(x^2*arctan(c*x)/(e*x^2+d)^(3/2),x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((a*x)/(e*Sqrt[d + e*x^2])) + (a*ArcTanh[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/e^(
3/2) + b*Defer[Int][(x^2*ArcTan[c*x])/(d + e*x^2)^(3/2), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx &= a\int \frac{x^2}{\left(d+ex^2\right)^{3/2}}\,dx+b\int \frac{x^2\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx\\
&= -\frac{ax}{e\sqrt{d+ex^2}}+b\int \frac{x^2\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx+\frac{a\int \frac{1}{\sqrt{d+ex^2}}\,dx}{e}\\
&= -\frac{ax}{e\sqrt{d+ex^2}}+b\int \frac{x^2\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{e}\\
&= -\frac{ax}{e\sqrt{d+ex^2}}+\frac{a\tanh^{-1}\left(\frac{\sqrt{e}\,x}{\sqrt{d+ex^2}}\right)}{e^{3/2}}+b\int \frac{x^2\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx
\end{aligned}$$

Mathematica [A] time = 20.12, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2), x]
```

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(bx^2\arctan(cx)+ax^2\right)\sqrt{ex^2+d}}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral((b*x^2*arctan(c*x) + a*x^2)*sqrt(e*x^2 + d)/(e^2*x^4 + 2*d*e*x^2 +
 d^2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.13, size = 0, normalized size = 0.00

$$\int \frac{x^2 (a + b \arctan(cx))}{(e x^2 + d)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2 \ (a + b \,\mathrm{atan}(c\,x))}{(e\,x^2 + d)^{3/2}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^(3/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^2 (a + b \,\mathrm{atan}(cx))}{(d + ex^2)^{\frac{3}{2}}} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))/(d + e*x**2)**(3/2), x)
```

3.1211 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=71

$$\frac{bc\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{e\sqrt{c^2d-e}}-\frac{a+b\tan^{-1}(cx)}{e\sqrt{d+ex^2}}$$

```
[Out] b*c*arctan(x*(c^2*d-e)^(1/2)/(e*x^2+d)^(1/2))/e/(c^2*d-e)^(1/2)+(-a-b*arcta
n(c*x))/e/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.07, antiderivative size = 71, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 3, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.143, Rules used = {4974, 377, 203}

$$\frac{bc\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{e\sqrt{c^2d-e}}-\frac{a+b\tan^{-1}(cx)}{e\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -((a + b*ArcTan[c*x])/(e*Sqrt[d + e*x^2])) + (b*c*ArcTan[(Sqrt[c^2*d - e]*x
)/Sqrt[d + e*x^2]])/(Sqrt[c^2*d - e]*e)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx=-\frac{a+b\tan^{-1}(cx)}{e\sqrt{d+ex^2}}+\frac{(bc)\int\frac{1}{\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,dx}{e}$$
$$=-\frac{a+b\tan^{-1}(cx)}{e\sqrt{d+ex^2}}+\frac{(bc)\,\text{Subst}\left(\int\frac{1}{1-\left(-c^2d+e\right)x^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{e}$$
$$=-\frac{a+b\tan^{-1}(cx)}{e\sqrt{d+ex^2}}+\frac{bc\tan^{-1}\left(\frac{\sqrt{c^2d-e}\,x}{\sqrt{d+ex^2}}\right)}{\sqrt{c^2d-e}\,e}$$

Mathematica [C] time = 0.40, size = 210, normalized size = 2.96

$$-\frac{\frac{2a}{\sqrt{d+ex^2}}+\frac{ibc\log\left(-\frac{4ie\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)\sqrt{c^2d-e}}\right)}{\sqrt{c^2d-e}}-\frac{ibc\log\left(\frac{4ie\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd+iex\right)}{b(cx-i)\sqrt{c^2d-e}}\right)}{\sqrt{c^2d-e}}+\frac{2b\tan^{-1}(cx)}{\sqrt{d+ex^2}}}{2e}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] -1/2*((2*a)/Sqrt[d + e*x^2] + (2*b*ArcTan[c*x])/Sqrt[d + e*x^2] + (I*b*c*Lo
g[((-4*I)*e*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d
- e]*(I + c*x))])/Sqrt[c^2*d - e] - (I*b*c*Log[((4*I)*e*(c*d + I*e*x + Sqrt
[c^2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*(-I + c*x))])/Sqrt[c^2*d -
 e])/e
```

fricas [B] time = 0.53, size = 379, normalized size = 5.34

$$\left[-\frac{\left(bcex^2+bcd\right)\sqrt{-c^2d+e}\,\log\left(\frac{\left(c^4d^2-8\,c^2de+8\,e^2\right)x^4-2\left(3\,c^2d^2-4\,de\right)x^2-4\left(\left(c^2d-2\,e\right)x^3-dx\right)\sqrt{-c^2d+e}\,\sqrt{ex^2+d}+d^2}{c^4x^4+2\,c^2x^2+1}\right)+4\left(ac^2d-ae+\right.}{4\left(c^2d^2e-de^2+\left(c^2de^2-e^3\right)x^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [-1/4*((b*c*e*x^2 + b*c*d)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e + 8*e
^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqrt(-c^2
*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 4*(a*c^2*d - a*
e + (b*c^2*d - b*e)*arctan(c*x))*sqrt(e*x^2 + d))/(c^2*d^2*e - d*e^2 + (c^2
*d*e^2 - e^3)*x^2), 1/2*((b*c*e*x^2 + b*c*d)*sqrt(c^2*d - e)*arctan(1/2*sqr
t(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 +
 (c^2*d^2 - d*e)*x)) - 2*(a*c^2*d - a*e + (b*c^2*d - b*e)*arctan(c*x))*sqrt
(e*x^2 + d))/(c^2*d^2*e - d*e^2 + (c^2*d*e^2 - e^3)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 0.99, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\arctan\left(cx\right)\right)}{\left(e\,x^{2}+d\right)^{\frac{3}{2}}}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive, negative or zero?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x*(a + b*atan(c*x)))/(d + e*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\left(a+b\operatorname{atan}{\left(cx\right)}\right)}{\left(d+ex^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral(x*(a + b*atan(c*x))/(d + e*x**2)**(3/2), x)
```

3.1212 $\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=70

$$\frac{x\left(a+b\tan^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d\sqrt{c^2d-e}}$$

```
[Out] b*arctanh(c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d/(c^2*d-e)^(1/2)+x*(a+b*arcta
n(c*x))/d/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.08, antiderivative size = 70, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.300, Rules used = $\{191, 4912, 12, 444, 63, 208\}$

$$\frac{x\left(a+b\tan^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d\sqrt{c^2d-e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + e*x^2)^(3/2),x]
```

```
[Out] (x*(a + b*ArcTan[c*x]))/(d*Sqrt[d + e*x^2]) + (b*ArcTanh[(c*Sqrt[d + e*x^2]
)/Sqrt[c^2*d - e]])/(d*Sqrt[c^2*d - e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx &= \frac{x\left(a+b\tan^{-1}(cx)\right)}{d\sqrt{d+ex^2}}-(bc)\int \frac{x}{d\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,dx\\
&= \frac{x\left(a+b\tan^{-1}(cx)\right)}{d\sqrt{d+ex^2}}-\frac{(bc)\int \frac{x}{\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,dx}{d}\\
&= \frac{x\left(a+b\tan^{-1}(cx)\right)}{d\sqrt{d+ex^2}}-\frac{(bc)\operatorname{Subst}\left(\int \frac{1}{\left(1+c^2x\right)\sqrt{d+ex}}\,dx,x,x^2\right)}{2d}\\
&= \frac{x\left(a+b\tan^{-1}(cx)\right)}{d\sqrt{d+ex^2}}-\frac{(bc)\operatorname{Subst}\left(\int \frac{1}{1-\frac{c^2d}{e}+\frac{c^2x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{de}\\
&= \frac{x\left(a+b\tan^{-1}(cx)\right)}{d\sqrt{d+ex^2}}+\frac{b\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d\sqrt{c^2d-e}}
\end{aligned}$$

Mathematica [C] time = 0.29, size = 202, normalized size = 2.89

$$\frac{\frac{2ax}{\sqrt{d+ex^2}}+\frac{b\log\left(-\frac{4cd\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)\sqrt{c^2d-e}}\right)}{\sqrt{c^2d-e}}+\frac{b\log\left(-\frac{4cd\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd+iex\right)}{b(cx-i)\sqrt{c^2d-e}}\right)}{\sqrt{c^2d-e}}+\frac{2bx\tan^{-1}(cx)}{\sqrt{d+ex^2}}}{2d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + e*x^2)^(3/2),x]
```

```
[Out] ((2*a*x)/Sqrt[d + e*x^2] + (2*b*x*ArcTan[c*x])/Sqrt[d + e*x^2] + (b*Log[(-4
*c*d*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*(I
 + c*x))])/Sqrt[c^2*d - e] + (b*Log[(-4*c*d*(c*d + I*e*x + Sqrt[c^2*d - e]*
Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*(-I + c*x))])/Sqrt[c^2*d - e])/(2*d)
```

fricas [B] time = 0.54, size = 388, normalized size = 5.54

$$\left[\frac{\left(bex^2+bd\right)\sqrt{c^2d-e}\,\log\left(\frac{c^4e^2x^4+8\,c^4d^2-8\,c^2de+2\left(4\,c^4de-3\,c^2e^2\right)x^2+4\left(c^3ex^2+2\,c^3d-ce\right)\sqrt{c^2d-e}\,\sqrt{ex^2+d}+e^2}{c^4x^4+2\,c^2x^2+1}\right)+4\sqrt{ex^2+d}\left(\left(bc^2\right.\right.}{4\left(c^2d^3-d^2e+\left(c^2d^2e-de^2\right)x^2\right)}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [1/4*((b*e*x^2 + b*d)*sqrt(c^2*d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*
d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^
2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 4*sqrt(e*x^2 +
 d)*((b*c^2*d - b*e)*x*arctan(c*x) + (a*c^2*d - a*e)*x))/(c^2*d^3 - d^2*e +
 (c^2*d^2*e - d*e^2)*x^2), 1/2*((b*e*x^2 + b*d)*sqrt(-c^2*d + e)*arctan(-1/
```

```
2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d
*e + (c^3*d*e - c*e^2)*x^2)) + 2*sqrt(e*x^2 + d)*((b*c^2*d - b*e)*x*arctan(
c*x) + (a*c^2*d - a*e)*x))/(c^2*d^3 - d^2*e + (c^2*d^2*e - d*e^2)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 2.14, size = 0, normalized size = 0.00

$$\int \frac{a + b \arctan \left(c x\right)}{\left(e \,x^{2}+d \right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{{\left(e\,x^2+d\right)}^{3/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((a + b*atan(c*x))/(d + e*x^2)^(3/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{atan}{\left(c x \right)}}{\left(d + e x^{2}\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*atan(c*x))/(d + e*x**2)**(3/2), x)
```

3.1213 $\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=67

$$b\text{Int}\left(\frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}},x\right)-\frac{a\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}+\frac{a}{d\sqrt{d+ex^2}}$$

```
[Out] -a*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)+a/d/(e*x^2+d)^(1/2)+b*Unintegra
ble(arctan(c*x)/x/(e*x^2+d)^(3/2),x)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^(3/2)),x]
```

```
[Out] a/(d*Sqrt[d + e*x^2]) - (a*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/d^(3/2) + b*De
fer[Int][ArcTan[c*x]/(x*(d + e*x^2)^(3/2)), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx &= a\int \frac{1}{x\left(d+ex^2\right)^{3/2}}\,dx+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x(d+ex)^{3/2}}\,dx,x,x^2\right)+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx\\
&= \frac{a}{d\sqrt{d+ex^2}}+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2d}\\
&= \frac{a}{d\sqrt{d+ex^2}}+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{de}\\
&= \frac{a}{d\sqrt{d+ex^2}}-\frac{a\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx
\end{aligned}$$

Mathematica [A] time = 56.73, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^(3/2)),x]
```

```
[Out] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^(3/2)), x]
```

fricas [A] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{e^2x^5+2\,dex^3+d^2x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/(e^2*x^5 + 2*d*e*x^3 + d^2*x),
 x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.11, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan(cx)}{x\left(e\,x^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arctan(c*x))/x/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{\operatorname{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{3}{2}}}-\frac{1}{\sqrt{ex^2+d}\,d}\right)+2\,b\int\frac{\arctan(cx)}{2\left(ex^3+dx\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -a*(arcsinh(d/(sqrt(d*e)*abs(x)))/d^(3/2) - 1/(sqrt(e*x^2 + d)*d)) + 2*b*in
tegrate(1/2*arctan(c*x)/((e*x^3 + d*x)*sqrt(e*x^2 + d)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}(c\,x)}{x\left(e\,x^2+d\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + e*x^2)^(3/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + e*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a+b\,\mathrm{atan}(cx)}{x\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x*(d + e*x**2)**(3/2)), x)
```

3.1214 $\int \frac{a+b\tan^{-1}(cx)}{x^2\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=135

$$-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}+\frac{b\left(c^2d-2e\right)\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d^2\sqrt{c^2d-e}}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}$$

```
[Out] -b*c*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(3/2)+b*(c^2*d-2*e)*arctanh(c*(e*x^
2+d)^(1/2)/(c^2*d-e)^(1/2))/d^2/(c^2*d-e)^(1/2)+(-a-b*arctan(c*x))/d/x/(e*x
^2+d)^(1/2)-2*e*x*(a+b*arctan(c*x))/d^2/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.23, antiderivative size = 135, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {271, 191, 4976, 12, 573, 156, 63, 208}

$$-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}+\frac{b\left(c^2d-2e\right)\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{d^2\sqrt{c^2d-e}}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^(3/2)),x]
```

```
[Out] -((a + b*ArcTan[c*x])/(d*x*Sqrt[d + e*x^2])) - (2*e*x*(a + b*ArcTan[c*x]))/
(d^2*Sqrt[d + e*x^2]) - (b*c*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/d^(3/2) + (b
*(c^2*d - 2*e)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(d^2*Sqrt[c^2*
d - e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 156

```
Int[(((e_.) + (f_.)*(x_))^(p_)*((g_.) + (h_.)*(x_)))/(((a_.) + (b_.)*(x_))*
((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[(b*g - a*h)/(b*c - a*d), Int[(e +
f*x)^p/(a + b*x), x], x] - Dist[(d*g - c*h)/(b*c - a*d), Int[(e + f*x)^p/(c
 + d*x), x], x] /; FreeQ[{a, b, c, d, e, f, g, h}, x]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 573

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simpl
ify[(m + 1)/n] - 1)*(a + b*x)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /;
 FreeQ[{a, b, c, d, e, f, m, n, p, q, r}, x] && IntegerQ[Simplify[(m + 1)/n
]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2\left(d+ex^2\right)^{3/2}}\,dx = -\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}-(bc)\int \frac{-d-2ex^2}{d^2x\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,dx$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}-\frac{(bc)\int \frac{-d-2ex^2}{x\left(1+c^2x^2\right)\sqrt{d+ex^2}}\,dx}{d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}-\frac{(bc)\,\mathrm{Subst}\left(\int \frac{-d-2ex}{x\left(1+c^2x\right)\sqrt{d+ex}}\,dx,x,x^2\right)}{2d^2}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}+\frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2d}-\frac{\left(bc\left(c^2d\right.\right.}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}+\frac{(bc)\,\mathrm{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ex^2}\right)}{de}-$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\sqrt{d+ex^2}}-\frac{2ex\left(a+b\tan^{-1}(cx)\right)}{d^2\sqrt{d+ex^2}}-\frac{bc\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{3/2}}+\frac{b\left(c^2d-2e\right)\tanh^{-1}}{d^2\sqrt{c^2d-}}$$

Mathematica [C] time = 0.70, size = 306, normalized size = 2.27

$$\frac{-\frac{2a\left(d+2ex^2\right)}{x\sqrt{d+ex^2}}+\frac{b\left(c^2d-2e\right)\log\left(-\frac{4cd^2\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)\left(c^2d-2e\right)\sqrt{c^2d-e}}\right)}{\sqrt{c^2d-e}}+\frac{b\left(c^2d-2e\right)\log\left(-\frac{4cd^2\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd+iex\right)}{b(cx-i)\left(c^2d-2e\right)\sqrt{c^2d-e}}\right)}{\sqrt{c^2d-e}}-2bc\sqrt{d}\log\left(\sqrt{d}\sqrt{d+e\right.}{2d^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^(3/2)),x]
```

```
[Out] ((-2*a*(d + 2*e*x^2))/(x*Sqrt[d + e*x^2]) - (2*b*(d + 2*e*x^2)*ArcTan[c*x])
/(x*Sqrt[d + e*x^2]) + 2*b*c*Sqrt[d]*Log[x] - 2*b*c*Sqrt[d]*Log[d + Sqrt[d]
*Sqrt[d + e*x^2]] + (b*(c^2*d - 2*e)*Log[(-4*c*d^2*(c*d - I*e*x + Sqrt[c^2*
d - e]*Sqrt[d + e*x^2]))/(b*(c^2*d - 2*e)*Sqrt[c^2*d - e]*(I + c*x))])/Sqrt
[c^2*d - e] + (b*(c^2*d - 2*e)*Log[(-4*c*d^2*(c*d + I*e*x + Sqrt[c^2*d - e]
*Sqrt[d + e*x^2]))/(b*(c^2*d - 2*e)*Sqrt[c^2*d - e]*(-I + c*x))])/Sqrt[c^2*
d - e])/(2*d^2)
```

fricas [B] time = 0.70, size = 1317, normalized size = 9.76

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [-1/4*(((b*c^2*d*e - 2*b*e^2)*x^3 + (b*c^2*d^2 - 2*b*d*e)*x)*sqrt(c^2*d - e
)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2
- 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4
*x^4 + 2*c^2*x^2 + 1)) - 2*((b*c^3*d*e - b*c*e^2)*x^3 + (b*c^3*d^2 - b*c*d*
e)*x)*sqrt(d)*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 4*(a*c^
2*d^2 - a*d*e + 2*(a*c^2*d*e - a*e^2)*x^2 + (b*c^2*d^2 - b*d*e + 2*(b*c^2*d
*e - b*e^2)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/((c^2*d^3*e - d^2*e^2)*x^3 +
 (c^2*d^4 - d^3*e)*x), 1/2*(((b*c^2*d*e - 2*b*e^2)*x^3 + (b*c^2*d^2 - 2*b*d
*e)*x)*sqrt(-c^2*d + e)*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d +
 e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) + ((b*c^3*d*
e - b*c*e^2)*x^3 + (b*c^3*d^2 - b*c*d*e)*x)*sqrt(d)*log(-(e*x^2 - 2*sqrt(e*
x^2 + d)*sqrt(d) + 2*d)/x^2) - 2*(a*c^2*d^2 - a*d*e + 2*(a*c^2*d*e - a*e^2)
*x^2 + (b*c^2*d^2 - b*d*e + 2*(b*c^2*d*e - b*e^2)*x^2)*arctan(c*x))*sqrt(e*
x^2 + d))/((c^2*d^3*e - d^2*e^2)*x^3 + (c^2*d^4 - d^3*e)*x), 1/4*(4*((b*c^3
*d*e - b*c*e^2)*x^3 + (b*c^3*d^2 - b*c*d*e)*x)*sqrt(-d)*arctan(sqrt(-d)/sqr
t(e*x^2 + d)) - ((b*c^2*d*e - 2*b*e^2)*x^3 + (b*c^2*d^2 - 2*b*d*e)*x)*sqrt(
c^2*d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*
e^2)*x^2 - 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) +
e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 4*(a*c^2*d^2 - a*d*e + 2*(a*c^2*d*e - a*e
^2)*x^2 + (b*c^2*d^2 - b*d*e + 2*(b*c^2*d*e - b*e^2)*x^2)*arctan(c*x))*sqrt
(e*x^2 + d))/((c^2*d^3*e - d^2*e^2)*x^3 + (c^2*d^4 - d^3*e)*x), 1/2*(((b*c^
2*d*e - 2*b*e^2)*x^3 + (b*c^2*d^2 - 2*b*d*e)*x)*sqrt(-c^2*d + e)*arctan(-1/
2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d
*e + (c^3*d*e - c*e^2)*x^2)) + 2*((b*c^3*d*e - b*c*e^2)*x^3 + (b*c^3*d^2 -
b*c*d*e)*x)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - 2*(a*c^2*d^2 - a*d*
e + 2*(a*c^2*d*e - a*e^2)*x^2 + (b*c^2*d^2 - b*d*e + 2*(b*c^2*d*e - b*e^2)*
x^2)*arctan(c*x))*sqrt(e*x^2 + d))/((c^2*d^3*e - d^2*e^2)*x^3 + (c^2*d^4 -
d^3*e)*x)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{a + b \arctan(cx)}{x^2 \left(e x^2 + d\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a\left(\frac{2\,ex}{\sqrt{ex^2+d}\,d^2}+\frac{1}{\sqrt{ex^2+d}\,dx}\right)+2\,b\int\frac{\arctan\left(cx\right)}{2\left(ex^4+dx^2\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] -a*(2*e*x/(sqrt(e*x^2 + d)*d^2) + 1/(sqrt(e*x^2 + d)*d*x)) + 2*b*integrate(
1/2*arctan(c*x)/((e*x^4 + d*x^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^2\,{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^(3/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{atan}\left(cx\right)}{x^2\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x**2*(d + e*x**2)**(3/2)), x)
```

3.1215 $\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=96

$$b\text{Int}\left(\frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}},x\right)+\frac{3ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2d^{5/2}}-\frac{3ae}{2d^2\sqrt{d+ex^2}}-\frac{a}{2dx^2\sqrt{d+ex^2}}$$

```
[Out] 3/2*a*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)-3/2*a*e/d^2/(e*x^2+d)^(1/2
)-1/2*a/d/x^2/(e*x^2+d)^(1/2)+b*Unintegrable(arctan(c*x)/x^3/(e*x^2+d)^(3/2
),x)
```

Rubi [A] time = 0.20, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^(3/2)),x]
```

```
[Out] a/(d*x^2*Sqrt[d + e*x^2]) - (3*a*Sqrt[d + e*x^2])/(2*d^2*x^2) + (3*a*e*ArcT
anh[Sqrt[d + e*x^2]/Sqrt[d]])/(2*d^(5/2)) + b*Defer[Int][ArcTan[c*x]/(x^3*(
d + e*x^2)^(3/2)), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx &= a\int \frac{1}{x^3\left(d+ex^2\right)^{3/2}}\,dx+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x^2(d+ex)^{3/2}}\,dx,x,x^2\right)+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx\\
&= \frac{a}{dx^2\sqrt{d+ex^2}}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx+\frac{(3a)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{d+ex}}\,dx,x,x^2\right)}{2d}\\
&= \frac{a}{dx^2\sqrt{d+ex^2}}-\frac{3a\sqrt{d+ex^2}}{2d^2x^2}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx-\frac{(3ae)\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{4d^2}\\
&= \frac{a}{dx^2\sqrt{d+ex^2}}-\frac{3a\sqrt{d+ex^2}}{2d^2x^2}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx-\frac{(3a)\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d+ \right.}{2d^2}\\
&= \frac{a}{dx^2\sqrt{d+ex^2}}-\frac{3a\sqrt{d+ex^2}}{2d^2x^2}+\frac{3ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2d^{5/2}}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx
\end{aligned}$$

Mathematica [A] time = 60.61, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^(3/2)),x]
[Out] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^(3/2)), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{e^2x^7+2\,dex^5+d^2x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(3/2),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/(e^2*x^7 + 2*d*e*x^5 + d^2*x^3
), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(3/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.05, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan(cx)}{x^3\left(e\,x^2+d\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^(3/2),x)
[Out] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a\left(\frac{3\,e\,\mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{5}{2}}}-\frac{3\,e}{\sqrt{ex^2+d}\,d^2}-\frac{1}{\sqrt{ex^2+d}\,dx^2}\right)+2\,b\int\frac{\arctan(cx)}{2\left(ex^5+dx^3\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(3/2),x, algorithm="maxima")
[Out] 1/2*a*(3*e*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(5/2) - 3*e/(sqrt(e*x^2 + d)*d^2
) - 1/(sqrt(e*x^2 + d)*d*x^2)) + 2*b*integrate(1/2*arctan(c*x)/((e*x^5 + d*
x^3)*sqrt(e*x^2 + d)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}(c\,x)}{x^3\,\left(e\,x^2+d\right)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^(3/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^(3/2)), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \operatorname{atan}(cx)}{x^3 \left(d + ex^2\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(e*x**2+d)**(3/2),x)
[Out] Integral((a + b*atan(c*x))/(x**3*(d + e*x**2)**(3/2)), x)
```

3.1216 $\int \frac{a+b\tan^{-1}(cx)}{x^4(d+ex^2)^{3/2}}\,dx$

Optimal. Leaf size=249

$$\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}}+\frac{bc\left(c^2d+4e\right)\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{3d^{5/2}}-\frac{b\left(c^4d^2+4c^2de\right.}{3}$$

```
[Out] 1/6*b*c*e*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)+1/3*b*c*(c^2*d+4*e)*arct
anh((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)-1/3*b*(c^4*d^2+4*c^2*d*e-8*e^2)*arctan
h(c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d^3/(c^2*d-e)^(1/2)+1/3*(-a-b*arctan(c
*x))/d/x^3/(e*x^2+d)^(1/2)+4/3*e*(a+b*arctan(c*x))/d^2/x/(e*x^2+d)^(1/2)+8/
3*e^2*x*(a+b*arctan(c*x))/d^3/(e*x^2+d)^(1/2)-1/6*b*c*(e*x^2+d)^(1/2)/d^2/x
^2
```

Rubi [A] time = 0.87, antiderivative size = 249, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {271, 191, 4976, 12, 6725, 266, 51, 63, 208, 444}

$$\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}}+\frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}}-\frac{b\left(c^4d^2+4c^2de-8e^2\right)\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d^3\sqrt{c^2d-e}}+\frac{bc\left(c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^4*(d + e*x^2)^(3/2)),x]
```

```
[Out] -(b*c*Sqrt[d + e*x^2])/(6*d^2*x^2) - (a + b*ArcTan[c*x])/(3*d*x^3*Sqrt[d +
e*x^2]) + (4*e*(a + b*ArcTan[c*x]))/(3*d^2*x*Sqrt[d + e*x^2]) + (8*e^2*x*(a
 + b*ArcTan[c*x]))/(3*d^3*Sqrt[d + e*x^2]) + (b*c*e*ArcTanh[Sqrt[d + e*x^2]
/Sqrt[d]])/(6*d^(5/2)) + (b*c*(c^2*d + 4*e)*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]
])/(3*d^(5/2)) - (b*(c^4*d^2 + 4*c^2*d*e - 8*e^2)*ArcTanh[(c*Sqrt[d + e*x^2
])/Sqrt[c^2*d - e]])/(3*d^3*Sqrt[c^2*d - e])
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^4\left(d+ex^2\right)^{3/2}}dx = -\frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} - (bc)\int \frac{-d^2+4}{3d^3x^3\left(1+\right.}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} - \frac{(bc)\int \frac{-d^2+4dex^2+8}{x^3\left(1+c^2x^2\right)\sqrt{}}}{3d^3}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} - \frac{(bc)\int\left(-\frac{d^2}{x^3\sqrt{d+ex^2}}\right.}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} + \frac{(bc)\int \frac{1}{x^3\sqrt{d+ex^2}}d}{3d}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} + \frac{(bc)\,\mathrm{Subst}\left(\int \frac{}{x^2\sqrt{}}\right.}{6d}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6d^2x^2} - \frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} - \frac{(b}{}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6d^2x^2} - \frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} + \frac{bc}{}$$

$$= -\frac{bc\sqrt{d+ex^2}}{6d^2x^2} - \frac{a+b\tan^{-1}(cx)}{3dx^3\sqrt{d+ex^2}} + \frac{4e\left(a+b\tan^{-1}(cx)\right)}{3d^2x\sqrt{d+ex^2}} + \frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} + \frac{bc}{}$$

Mathematica [C] time = 0.76, size = 405, normalized size = 1.63

$$-\frac{\frac{2a\left(d^2-4dex^2-8e^2x^4\right)+bcdx\left(d+ex^2\right)}{x^3\sqrt{d+ex^2}} - bc\sqrt{d}\left(2c^2d+9e\right)\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right) + bc\sqrt{d}\log(x)\left(2c^2d+9e\right) + \frac{b\left(c^4d^2+4\right.}{}}{6d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^4*(d + e*x^2)^(3/2)),x]
```

```
[Out] -1/6*((b*c*d*x*(d + e*x^2) + 2*a*(d^2 - 4*d*e*x^2 - 8*e^2*x^4))/(x^3*Sqrt[d
 + e*x^2]) + (2*b*(d^2 - 4*d*e*x^2 - 8*e^2*x^4)*ArcTan[c*x])/(x^3*Sqrt[d +
e*x^2]) + b*c*Sqrt[d]*(2*c^2*d + 9*e)*Log[x] - b*c*Sqrt[d]*(2*c^2*d + 9*e)*
Log[d + Sqrt[d]*Sqrt[d + e*x^2]] + (b*(c^4*d^2 + 4*c^2*d*e - 8*e^2)*Log[(12
*c*d^3*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*Sqrt[c^2*d - e]*
(c^4*d^2 + 4*c^2*d*e - 8*e^2)*(I + c*x))])/Sqrt[c^2*d - e] + (b*(c^4*d^2 +
4*c^2*d*e - 8*e^2)*Log[(12*c*d^3*(c*d + I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*
x^2]))/(b*Sqrt[c^2*d - e]*(c^4*d^2 + 4*c^2*d*e - 8*e^2)*(-I + c*x))])/Sqrt[
c^2*d - e])/d^3
```

fricas [B] time = 0.90, size = 1920, normalized size = 7.71

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] [-1/12*(((b*c^4*d^2*e + 4*b*c^2*d*e^2 - 8*b*e^3)*x^5 + (b*c^4*d^3 + 4*b*c^2
*d^2*e - 8*b*d*e^2)*x^3)*sqrt(c^2*d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c
^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt
(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - ((2*b*c^5*d
^2*e + 7*b*c^3*d*e^2 - 9*b*c*e^3)*x^5 + (2*b*c^5*d^3 + 7*b*c^3*d^2*e - 9*b*
c*d*e^2)*x^3)*sqrt(d)*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) +
 2*(2*a*c^2*d^3 - 16*(a*c^2*d*e^2 - a*e^3)*x^4 - 2*a*d^2*e + (b*c^3*d^2*e -
 b*c*d*e^2)*x^3 - 8*(a*c^2*d^2*e - a*d*e^2)*x^2 + (b*c^3*d^3 - b*c*d^2*e)*x
 + 2*(b*c^2*d^3 - 8*(b*c^2*d*e^2 - b*e^3)*x^4 - b*d^2*e - 4*(b*c^2*d^2*e -
b*d*e^2)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/((c^2*d^4*e - d^3*e^2)*x^5 + (c
^2*d^5 - d^4*e)*x^3), -1/12*(2*((b*c^4*d^2*e + 4*b*c^2*d*e^2 - 8*b*e^3)*x^5
 + (b*c^4*d^3 + 4*b*c^2*d^2*e - 8*b*d*e^2)*x^3)*sqrt(-c^2*d + e)*arctan(-1/
2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d
*e + (c^3*d*e - c*e^2)*x^2)) - ((2*b*c^5*d^2*e + 7*b*c^3*d*e^2 - 9*b*c*e^3)
*x^5 + (2*b*c^5*d^3 + 7*b*c^3*d^2*e - 9*b*c*d*e^2)*x^3)*sqrt(d)*log(-(e*x^2
 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*(2*a*c^2*d^3 - 16*(a*c^2*d*e^2
 - a*e^3)*x^4 - 2*a*d^2*e + (b*c^3*d^2*e - b*c*d*e^2)*x^3 - 8*(a*c^2*d^2*e
- a*d*e^2)*x^2 + (b*c^3*d^3 - b*c*d^2*e)*x + 2*(b*c^2*d^3 - 8*(b*c^2*d*e^2
- b*e^3)*x^4 - b*d^2*e - 4*(b*c^2*d^2*e - b*d*e^2)*x^2)*arctan(c*x))*sqrt(e
*x^2 + d))/((c^2*d^4*e - d^3*e^2)*x^5 + (c^2*d^5 - d^4*e)*x^3), -1/12*(2*((
2*b*c^5*d^2*e + 7*b*c^3*d*e^2 - 9*b*c*e^3)*x^5 + (2*b*c^5*d^3 + 7*b*c^3*d^2
*e - 9*b*c*d*e^2)*x^3)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + ((b*c^4*
d^2*e + 4*b*c^2*d*e^2 - 8*b*e^3)*x^5 + (b*c^4*d^3 + 4*b*c^2*d^2*e - 8*b*d*e
^2)*x^3)*sqrt(c^2*d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^
4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt
(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 2*(2*a*c^2*d^3 - 16*(a*c^2*
d*e^2 - a*e^3)*x^4 - 2*a*d^2*e + (b*c^3*d^2*e - b*c*d*e^2)*x^3 - 8*(a*c^2*d
^2*e - a*d*e^2)*x^2 + (b*c^3*d^3 - b*c*d^2*e)*x + 2*(b*c^2*d^3 - 8*(b*c^2*d
*e^2 - b*e^3)*x^4 - b*d^2*e - 4*(b*c^2*d^2*e - b*d*e^2)*x^2)*arctan(c*x))*s
qrt(e*x^2 + d))/((c^2*d^4*e - d^3*e^2)*x^5 + (c^2*d^5 - d^4*e)*x^3), -1/6*(
((b*c^4*d^2*e + 4*b*c^2*d*e^2 - 8*b*e^3)*x^5 + (b*c^4*d^3 + 4*b*c^2*d^2*e -
 8*b*d*e^2)*x^3)*sqrt(-c^2*d + e)*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqr
t(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) +
((2*b*c^5*d^2*e + 7*b*c^3*d*e^2 - 9*b*c*e^3)*x^5 + (2*b*c^5*d^3 + 7*b*c^3*d
^2*e - 9*b*c*d*e^2)*x^3)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (2*a*c
^2*d^3 - 16*(a*c^2*d*e^2 - a*e^3)*x^4 - 2*a*d^2*e + (b*c^3*d^2*e - b*c*d*e^
2)*x^3 - 8*(a*c^2*d^2*e - a*d*e^2)*x^2 + (b*c^3*d^3 - b*c*d^2*e)*x + 2*(b*c
^2*d^3 - 8*(b*c^2*d*e^2 - b*e^3)*x^4 - b*d^2*e - 4*(b*c^2*d^2*e - b*d*e^2)*
x^2)*arctan(c*x))*sqrt(e*x^2 + d))/((c^2*d^4*e - d^3*e^2)*x^5 + (c^2*d^5 -
d^4*e)*x^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0 x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{a + b \arctan(cx)}{x^4 \left(e x^2 + d\right)^{\frac{3}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^4/(e*x^2+d)^(3/2),x)
```

```
[Out] int((a+b*arctan(c*x))/x^4/(e*x^2+d)^(3/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,a\left(\frac{8\,e^2x}{\sqrt{ex^2+d}\,d^3}+\frac{4\,e}{\sqrt{ex^2+d}\,d^2x}-\frac{1}{\sqrt{ex^2+d}\,dx^3}\right)+2\,b\int\frac{\arctan(cx)}{2\left(ex^6+dx^4\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(8*e^2*x/(sqrt(e*x^2 + d)*d^3) + 4*e/(sqrt(e*x^2 + d)*d^2*x) - 1/(sqr
t(e*x^2 + d)*d*x^3)) + 2*b*integrate(1/2*arctan(c*x)/((e*x^6 + d*x^4)*sqrt(
e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^4\,{\left(e\,x^2+d\right)}^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^4*(d + e*x^2)^(3/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^4*(d + e*x^2)^(3/2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{a+b\,\mathrm{atan}\,(cx)}{x^4\left(d+ex^2\right)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**4/(e*x**2+d)**(3/2),x)
```

```
[Out] Integral((a + b*atan(c*x))/(x**4*(d + e*x**2)**(3/2)), x)
```

3.1217 $\int \frac{x^4(a+b\tan^{-1}(cx))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=91

$$b\text{Int}\left(\frac{x^4\tan^{-1}(cx)}{(d+ex^2)^{5/2}},x\right)+\frac{a\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{e^{5/2}}-\frac{ax}{e^2\sqrt{d+ex^2}}-\frac{ax^3}{3e(d+ex^2)^{3/2}}$$

```
[Out] -1/3*a*x^3/e/(e*x^2+d)^(3/2)+a*arctanh(x*e^(1/2)/(e*x^2+d)^(1/2))/e^(5/2)-a
*x/e^2/(e*x^2+d)^(1/2)+b*Unintegrable(x^4*arctan(c*x)/(e*x^2+d)^(5/2),x)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^4(a+b\tan^{-1}(cx))}{(d+ex^2)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^4*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(a*x^3)/(3*e*(d + e*x^2)^(3/2)) - (a*x)/(e^2*Sqrt[d + e*x^2]) + (a*ArcTanh
[(Sqrt[e]*x)/Sqrt[d + e*x^2]])/e^(5/2) + b*Defer[Int][(x^4*ArcTan[c*x])/(d
+ e*x^2)^(5/2), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^4(a+b\tan^{-1}(cx))}{(d+ex^2)^{5/2}}\,dx &= a\int \frac{x^4}{(d+ex^2)^{5/2}}\,dx+b\int \frac{x^4\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx\\
&= -\frac{ax^3}{3e(d+ex^2)^{3/2}}+b\int \frac{x^4\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx+\frac{a\int \frac{x^2}{(d+ex^2)^{3/2}}\,dx}{e}\\
&= -\frac{ax^3}{3e(d+ex^2)^{3/2}}-\frac{ax}{e^2\sqrt{d+ex^2}}+b\int \frac{x^4\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx+\frac{a\int \frac{1}{\sqrt{d+ex^2}}\,dx}{e^2}\\
&= -\frac{ax^3}{3e(d+ex^2)^{3/2}}-\frac{ax}{e^2\sqrt{d+ex^2}}+b\int \frac{x^4\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{1-ex^2}\,dx,x,\frac{x}{\sqrt{d+e}}\right.}{e^2}\\
&= -\frac{ax^3}{3e(d+ex^2)^{3/2}}-\frac{ax}{e^2\sqrt{d+ex^2}}+\frac{a\tanh^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d+ex^2}}\right)}{e^{5/2}}+b\int \frac{x^4\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx
\end{aligned}$$

Mathematica [A] time = 12.06, size = 0, normalized size = 0.00

$$\int \frac{x^4(a+b\tan^{-1}(cx))}{(d+ex^2)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^4*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] Integrate[(x^4*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\left(bx^4\arctan\left(cx\right)+ax^4\right)\sqrt{ex^2+d}}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral((b*x^4*arctan(c*x) + a*x^4)*sqrt(e*x^2 + d)/(e^3*x^6 + 3*d*e^2*x^4
 + 3*d^2*e*x^2 + d^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 1.26, size = 0, normalized size = 0.00

$$\int\frac{x^4\left(a+b\arctan\left(cx\right)\right)}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^4*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive or negative?
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int\frac{x^4\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^4*(a + b*atan(c*x)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x^4*(a + b*atan(c*x)))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*atan(c*x))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.1218 $\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=143

$$-\frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}}+\frac{bc\left(2c^2d-3e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{3e^2\left(c^2d-e\right)^{3/2}}+\frac{bcx}{3e\left(c^2d-e\right)\sqrt{d+ex^2}}$$

```
[Out] 1/3*d*(a+b*arctan(c*x))/e^2/(e*x^2+d)^(3/2)+1/3*b*c*(2*c^2*d-3*e)*arctan(x*
(c^2*d-e)^(1/2)/(e*x^2+d)^(1/2))/(c^2*d-e)^(3/2)/e^2+1/3*b*c*x/(c^2*d-e)/e/
(e*x^2+d)^(1/2)+(-a-b*arctan(c*x))/e^2/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.21, antiderivative size = 143, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {266, 43, 4976, 12, 527, 377, 203}

$$-\frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}}+\frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}}+\frac{bc\left(2c^2d-3e\right)\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{3e^2\left(c^2d-e\right)^{3/2}}+\frac{bcx}{3e\left(c^2d-e\right)\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c*x)/(3*(c^2*d - e)*e*Sqrt[d + e*x^2]) + (d*(a + b*ArcTan[c*x]))/(3*e^2*
(d + e*x^2)^(3/2)) - (a + b*ArcTan[c*x])/(e^2*Sqrt[d + e*x^2]) + (b*c*(2*c^
2*d - 3*e)*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(3*(c^2*d - e)^(3/2
)*e^2)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
```

```
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 527

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_.)*((e_) + (f
_.)*(x_)^(n_)), x_Symbol] :> -Simp[((b*e - a*f)*x*(a + b*x^n)^(p + 1)*(c +
d*x^n)^(q + 1))/(a*n*(b*c - a*d)*(p + 1)), x] + Dist[1/(a*n*(b*c - a*d)*(p
+ 1)), Int[(a + b*x^n)^(p + 1)*(c + d*x^n)^q*Simp[c*(b*e - a*f) + e*n*(b*c
- a*d)*(p + 1) + d*(b*e - a*f)*(n*(p + q + 2) + 1)*x^n, x], x], x] /; FreeQ
[{a, b, c, d, e, f, n, q}, x] && LtQ[p, -1]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}} - (bc)\int \frac{-2d-3ex^2}{3e^2\left(1+c^2x^2\right)\left(d+ex^2\right)^{3/2}}\,dx$$

$$= \frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}} - \frac{(bc)\int \frac{-2d-3ex^2}{\left(1+c^2x^2\right)\left(d+ex^2\right)^{3/2}}\,dx}{3e^2}$$

$$= \frac{bcx}{3\left(c^2d-e\right)e\sqrt{d+ex^2}} + \frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}} + \frac{(bc)\int \frac{d\left(2c^2d-3e\right)}{\left(1+c^2x^2\right)\sqrt{d+ex^2}}}{3d\left(c^2d-e\right)e^2}$$

$$= \frac{bcx}{3\left(c^2d-e\right)e\sqrt{d+ex^2}} + \frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}} + \frac{\left(bc\left(2c^2d-3e\right)\right)\int}{3\left(c^2d-\right.}$$

$$= \frac{bcx}{3\left(c^2d-e\right)e\sqrt{d+ex^2}} + \frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}} + \frac{\left(bc\left(2c^2d-3e\right)\right)\mathrm{Su}}{}$$

$$= \frac{bcx}{3\left(c^2d-e\right)e\sqrt{d+ex^2}} + \frac{d\left(a+b\tan^{-1}(cx)\right)}{3e^2\left(d+ex^2\right)^{3/2}} - \frac{a+b\tan^{-1}(cx)}{e^2\sqrt{d+ex^2}} + \frac{bc\left(2c^2d-3e\right)\tan}{3\left(c^2d-e\right)^3}$$

Mathematica [C] time = 0.60, size = 326, normalized size = 2.28

$$\frac{2\sqrt{c^2d-e}\left(bcex\left(d+ex^2\right)-a\left(c^2d-e\right)\left(2d+3ex^2\right)\right)-ibc\left(2c^2d-3e\right)\left(d+ex^2\right)^{3/2}\log\left(-\frac{12ie^2\sqrt{c^2d-e}\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+\right.}{b(cx+i)\left(2c^2d-3e\right)}\right.}{6e^2\left(c^2d-e\right)^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (2*Sqrt[c^2*d - e]*(b*c*e*x*(d + e*x^2) - a*(c^2*d - e)*(2*d + 3*e*x^2)) -
2*b*(c^2*d - e)^(3/2)*(2*d + 3*e*x^2)*ArcTan[c*x] - I*b*c*(2*c^2*d - 3*e)*(
d + e*x^2)^(3/2)*Log[((-12*I)*Sqrt[c^2*d - e]*e^2*(c*d - I*e*x + Sqrt[c^2*d
 - e]*Sqrt[d + e*x^2]))/(b*(2*c^2*d - 3*e)*(I + c*x))] + I*b*c*(2*c^2*d - 3
*e)*(d + e*x^2)^(3/2)*Log[((12*I)*Sqrt[c^2*d - e]*e^2*(c*d + I*e*x + Sqrt[c
^2*d - e]*Sqrt[d + e*x^2]))/(b*(2*c^2*d - 3*e)*(-I + c*x))])/(6*(c^2*d - e)
^(3/2)*e^2*(d + e*x^2)^(3/2))
```

fricas [B] time = 0.97, size = 863, normalized size = 6.03

$$\left[-\frac{\left(2\,bc^3d^3-3\,bcd^2e+\left(2\,bc^3de^2-3\,bce^3\right)x^4+2\left(2\,bc^3d^2e-3\,bcde^2\right)x^2\right)\sqrt{-c^2d+e}\,\log\left(\frac{\left(c^4d^2-8\,c^2de+8\,e^2\right)x^4-2\,(3\,c^2\cdots}{\cdots}\right.}{\cdots}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/12*((2*b*c^3*d^3 - 3*b*c*d^2*e + (2*b*c^3*d*e^2 - 3*b*c*e^3)*x^4 + 2*(2
*b*c^3*d^2*e - 3*b*c*d*e^2)*x^2)*sqrt(-c^2*d + e)*log(((c^4*d^2 - 8*c^2*d*e
 + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 - 4*((c^2*d - 2*e)*x^3 - d*x)*sqr
t(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 4*(2*a*c^
4*d^3 - 4*a*c^2*d^2*e + 2*a*d*e^2 - (b*c^3*d*e^2 - b*c*e^3)*x^3 + 3*(a*c^4*
d^2*e - 2*a*c^2*d*e^2 + a*e^3)*x^2 - (b*c^3*d^2*e - b*c*d*e^2)*x + (2*b*c^4
*d^3 - 4*b*c^2*d^2*e + 2*b*d*e^2 + 3*(b*c^4*d^2*e - 2*b*c^2*d*e^2 + b*e^3)*
x^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^4*d^4*e^2 - 2*c^2*d^3*e^3 + d^2*e^4 +
 (c^4*d^2*e^4 - 2*c^2*d*e^5 + e^6)*x^4 + 2*(c^4*d^3*e^3 - 2*c^2*d^2*e^4 + d
*e^5)*x^2), 1/6*((2*b*c^3*d^3 - 3*b*c*d^2*e + (2*b*c^3*d*e^2 - 3*b*c*e^3)*x
^4 + 2*(2*b*c^3*d^2*e - 3*b*c*d*e^2)*x^2)*sqrt(c^2*d - e)*arctan(1/2*sqrt(c
^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 + d)/((c^2*d*e - e^2)*x^3 + (c
^2*d^2 - d*e)*x)) - 2*(2*a*c^4*d^3 - 4*a*c^2*d^2*e + 2*a*d*e^2 - (b*c^3*d*e
^2 - b*c*e^3)*x^3 + 3*(a*c^4*d^2*e - 2*a*c^2*d*e^2 + a*e^3)*x^2 - (b*c^3*d^
2*e - b*c*d*e^2)*x + (2*b*c^4*d^3 - 4*b*c^2*d^2*e + 2*b*d*e^2 + 3*(b*c^4*d^
2*e - 2*b*c^2*d*e^2 + b*e^3)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^4*d^4*e^
2 - 2*c^2*d^3*e^3 + d^2*e^4 + (c^4*d^2*e^4 - 2*c^2*d*e^5 + e^6)*x^4 + 2*(c^
4*d^3*e^3 - 2*c^2*d^2*e^4 + d*e^5)*x^2)]
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{x^3\,(a+b\arctan(cx))}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive, negative or zero?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^3\ (a+b\,\mathrm{atan}\,(c\,x))}{\left(e\,x^2+d\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x^3*(a + b*atan(c*x)))/(d + e*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3\,(a+b\,\mathrm{atan}\,(cx))}{\left(d+ex^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))/(e*x**2+d)**(5/2),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))/(d + e*x**2)**(5/2), x)
```

3.1219 $\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=109

$$\frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{bc}{3e\left(c^2d-e\right)\sqrt{d+ex^2}}-\frac{b\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d\left(c^2d-e\right)^{3/2}}$$

```
[Out] 1/3*x^3*(a+b*arctan(c*x))/d/(e*x^2+d)^(3/2)-1/3*b*arctanh(c*(e*x^2+d)^(1/2)
/(c^2*d-e)^(1/2))/d/(c^2*d-e)^(3/2)+1/3*b*c/(c^2*d-e)/e/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.20, antiderivative size = 109, normalized size of antiderivative = 1.00, number of steps used = 5, number of rules used = 6, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.261, Rules used = {264, 4976, 446, 78, 63, 208}

$$\frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{bc}{3e\left(c^2d-e\right)\sqrt{d+ex^2}}-\frac{b\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d\left(c^2d-e\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (b*c)/(3*(c^2*d - e)*e*Sqrt[d + e*x^2]) + (x^3*(a + b*ArcTan[c*x]))/(3*d*(d
 + e*x^2)^(3/2)) - (b*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(3*d*(c
^2*d - e)^(3/2))
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}} - (bc)\int \frac{x^3}{\left(3d+3c^2dx^2\right)\left(d+ex^2\right)^{3/2}}\,dx$$

$$= \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}} - \frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{x}{\left(3d+3c^2dx\right)(d+ex)^{3/2}}\,dx, x, x^2\right)$$

$$= \frac{bc}{3\left(c^2d-e\right)e\sqrt{d+ex^2}} + \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}} + \frac{(bc)\,\text{Subst}\left(\int \frac{1}{\left(3d+3c^2dx\right)\sqrt{d+ex}}\,dx, x, x\right.}{2\left(c^2d-e\right)}$$

$$= \frac{bc}{3\left(c^2d-e\right)e\sqrt{d+ex^2}} + \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}} + \frac{(bc)\,\text{Subst}\left(\int \frac{1}{3d-\frac{3c^2d^2}{e}+\frac{3c^2dx^2}{e}}\,dx, x, \sqrt{\right.}{\left(c^2d-e\right)e}$$

$$= \frac{bc}{3\left(c^2d-e\right)e\sqrt{d+ex^2}} + \frac{x^3\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}} - \frac{b\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d\left(c^2d-e\right)^{3/2}}$$

Mathematica [C] time = 1.11, size = 252, normalized size = 2.31

$$-\frac{-\frac{2\left(ax\left(c^2d-e\right)+bcd\right)}{e\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{2adx}{e\left(d+ex^2\right)^{3/2}}+\frac{b\log\left(\frac{12cd\sqrt{c^2d-e}\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)}\right)}{\left(c^2d-e\right)^{3/2}}+\frac{b\log\left(\frac{12cd\sqrt{c^2d-e}\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd+iex\right)}{b(cx-i)}\right)}{\left(c^2d-e\right)^{3/2}}-\frac{2bx^3\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}}{6d}$$

Antiderivative was successfully verified.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -1/6*((2*a*d*x)/(e*(d + e*x^2)^(3/2)) - (2*(b*c*d + a*(c^2*d - e)*x))/((c^2
*d - e)*e*Sqrt[d + e*x^2]) - (2*b*x^3*ArcTan[c*x])/(d + e*x^2)^(3/2) + (b*L
og[(12*c*d*Sqrt[c^2*d - e]*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))
/(b*(I + c*x))])/(c^2*d - e)^(3/2) + (b*Log[(12*c*d*Sqrt[c^2*d - e]*(c*d +
I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(-I + c*x))])/(c^2*d - e)^(3/2
))/d
```

fricas [B] time = 0.76, size = 676, normalized size = 6.20

$$\left[-\frac{\left(be^3x^4+2\,bde^2x^2+bd^2e\right)\sqrt{c^2d-e}\,\log\left(\frac{c^4e^2x^4+8\,c^4d^2-8\,c^2de+2\left(4\,c^4de-3\,c^2e^2\right)x^2+4\left(c^3ex^2+2\,c^3d-ce\right)\sqrt{c^2d-e}\,\sqrt{ex^2+d}+e^2}{c^4x^4+2\,c^2x^2+1}\right)-4\cdots}{12\left(c^4d^5e-2\,c^2d^4e^2+d^3e^3+\left(c^4d^3e^3-\cdots\right.\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/12*((b*e^3*x^4 + 2*b*d*e^2*x^2 + b*d^2*e)*sqrt(c^2*d - e)*log((c^4*e^2*
x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2
+ 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^
2 + 1)) - 4*(b*c^3*d^3 - b*c*d^2*e + (b*c^4*d^2*e - 2*b*c^2*d*e^2 + b*e^3)*
x^3*arctan(c*x) + (a*c^4*d^2*e - 2*a*c^2*d*e^2 + a*e^3)*x^3 + (b*c^3*d^2*e
- b*c*d*e^2)*x^2)*sqrt(e*x^2 + d))/(c^4*d^5*e - 2*c^2*d^4*e^2 + d^3*e^3 + (
c^4*d^3*e^3 - 2*c^2*d^2*e^4 + d*e^5)*x^4 + 2*(c^4*d^4*e^2 - 2*c^2*d^3*e^3 +
 d^2*e^4)*x^2), -1/6*((b*e^3*x^4 + 2*b*d*e^2*x^2 + b*d^2*e)*sqrt(-c^2*d + e
)*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c
^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) - 2*(b*c^3*d^3 - b*c*d^2*e + (b*c^
4*d^2*e - 2*b*c^2*d*e^2 + b*e^3)*x^3*arctan(c*x) + (a*c^4*d^2*e - 2*a*c^2*d
*e^2 + a*e^3)*x^3 + (b*c^3*d^2*e - b*c*d*e^2)*x^2)*sqrt(e*x^2 + d))/(c^4*d^
5*e - 2*c^2*d^4*e^2 + d^3*e^3 + (c^4*d^3*e^3 - 2*c^2*d^2*e^4 + d*e^5)*x^4 +
 2*(c^4*d^4*e^2 - 2*c^2*d^3*e^3 + d^2*e^4)*x^2)]
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a+b\arctan\left(cx\right)\right)}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\,a\left(\frac{x}{\left(ex^2+d\right)^{\frac{3}{2}}e}-\frac{x}{\sqrt{ex^2+d}\,de}\right)+2\,b\int\frac{x^2\arctan\left(cx\right)}{2\left(e^2x^4+2\,dex^2+d^2\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*a*(x/((e*x^2 + d)^(3/2)*e) - x/(sqrt(e*x^2 + d)*d*e)) + 2*b*integrate(
1/2*x^2*arctan(c*x)/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^2\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^(5/2),x)
[Out] int((x^2*(a + b*atan(c*x)))/(d + e*x^2)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))/(e*x**2+d)**(5/2),x)
[Out] Timed out
```

3.1220 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=110

$$-\frac{a+b\tan^{-1}(cx)}{3e\left(d+ex^2\right)^{3/2}}-\frac{bcx}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{bc^3\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{3e\left(c^2d-e\right)^{3/2}}$$

```
[Out] 1/3*(-a-b*arctan(c*x))/e/(e*x^2+d)^(3/2)+1/3*b*c^3*arctan(x*(c^2*d-e)^(1/2)
/(e*x^2+d)^(1/2))/(c^2*d-e)^(3/2)/e-1/3*b*c*x/d/(c^2*d-e)/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.09, antiderivative size = 110, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {4974, 382, 377, 203}

$$-\frac{a+b\tan^{-1}(cx)}{3e\left(d+ex^2\right)^{3/2}}-\frac{bcx}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{bc^3\tan^{-1}\left(\frac{x\sqrt{c^2d-e}}{\sqrt{d+ex^2}}\right)}{3e\left(c^2d-e\right)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*c*x)/(3*d*(c^2*d - e)*Sqrt[d + e*x^2]) - (a + b*ArcTan[c*x])/(3*e*(d +
e*x^2)^(3/2)) + (b*c^3*ArcTan[(Sqrt[c^2*d - e]*x)/Sqrt[d + e*x^2]])/(3*(c^2
*d - e)^(3/2)*e)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 377

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Su
bst[Int[1/(c - (b*c - a*d)*x^n), x], x, x/(a + b*x^n)^(1/n)] /; FreeQ[{a, b
, c, d}, x] && NeQ[b*c - a*d, 0] && EqQ[n*p + 1, 0] && IntegerQ[n]
```

Rule 382

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_))^(q_), x_Symbol]
:> -Simp[(b*x*(a + b*x^n)^(p + 1)*(c + d*x^n)^(q + 1))/(a*n*(p + 1)*(b*c -
a*d)), x] + Dist[(b*c + n*(p + 1)*(b*c - a*d))/(a*n*(p + 1)*(b*c - a*d)), I
nt[(a + b*x^n)^(p + 1)*(c + d*x^n)^q, x], x] /; FreeQ[{a, b, c, d, n, q}, x
] && NeQ[b*c - a*d, 0] && EqQ[n*(p + q + 2) + 1, 0] && (LtQ[p, -1] ||  !LtQ
[q, -1]) && NeQ[p, -1]
```

Rule 4974

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)*((d_.) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Simp[((d + e*x^2)^(q + 1)*(a + b*ArcTan[c*x]))/(2*e*(q + 1)), x
] - Dist[(b*c)/(2*e*(q + 1)), Int[(d + e*x^2)^(q + 1)/(1 + c^2*x^2), x], x]
 /; FreeQ[{a, b, c, d, e, q}, x] && NeQ[q, -1]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{5/2}}\,dx = -\frac{a+b\tan^{-1}(cx)}{3e\left(d+ex^2\right)^{3/2}}+\frac{(bc)\int \frac{1}{(1+c^2x^2)\left(d+ex^2\right)^{3/2}}\,dx}{3e}$$

$$= -\frac{bcx}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{3e\left(d+ex^2\right)^{3/2}}+\frac{\left(bc^3\right)\int \frac{1}{(1+c^2x^2)\sqrt{d+ex^2}}\,dx}{3\left(c^2d-e\right)e}$$

$$= -\frac{bcx}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{3e\left(d+ex^2\right)^{3/2}}+\frac{\left(bc^3\right)\text{Subst}\left(\int \frac{1}{1-\left(-c^2d+e\right)x^2}\,dx,x,\frac{x}{\sqrt{d+ex^2}}\right)}{3\left(c^2d-e\right)e}$$

$$= -\frac{bcx}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{3e\left(d+ex^2\right)^{3/2}}+\frac{bc^3\tan^{-1}\left(\frac{\sqrt{c^2d-e}\,x}{\sqrt{d+ex^2}}\right)}{3\left(c^2d-e\right)^{3/2}e}$$

Mathematica [C] time = 0.78, size = 259, normalized size = 2.35

$$\frac{1}{6}\left(-\frac{2a}{e\left(d+ex^2\right)^{3/2}}-\frac{2bcx}{\left(c^2d^2-de\right)\sqrt{d+ex^2}}-\frac{ibc^3\log\left(-\frac{12ie\sqrt{c^2d-e}\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{bc^2(cx+i)}\right)}{e\left(c^2d-e\right)^{3/2}}+\frac{ibc^3\log\left(\frac{12ie\sqrt{c^2d-e}\left(\sqrt{c^2 \ldots\right.}{bc^2 \ldots}\right)}{e\left(c^2d-e \ldots\right.}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(x*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] ((-2*a)/(e*(d + e*x^2)^(3/2)) - (2*b*c*x)/((c^2*d^2 - d*e)*Sqrt[d + e*x^2])
 - (2*b*ArcTan[c*x])/(e*(d + e*x^2)^(3/2)) - (I*b*c^3*Log[((-12*I)*Sqrt[c^2
*d - e]*e*(c*d - I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*c^2*(I + c*x)
)])/((c^2*d - e)^(3/2)*e) + (I*b*c^3*Log[((12*I)*Sqrt[c^2*d - e]*e*(c*d + I
*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*c^2*(-I + c*x))])/((c^2*d - e)^
(3/2)*e))/6
```

fricas [B] time = 0.89, size = 679, normalized size = 6.17

$$\left[\frac{\left(bc^3de^2x^4+2\,bc^3d^2ex^2+bc^3d^3\right)\sqrt{-c^2d+e}\,\log\left(\frac{\left(c^4d^2-8\,c^2de+8\,e^2\right)x^4-2\left(3\,c^2d^2-4\,de\right)x^2+4\left(\left(c^2d-2\,e\right)x^3-dx\right)\sqrt{-c^2d+e}\,\sqrt{ex^2+d}+d^2}{c^4x^4+2\,c^2x^2+1}\right) \ldots}{12\left(c^4d^5e-2\,c^2d^4e^2+d^3e^3+\left(c^4d^3e^3-2 \ldots\right.\right.}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/12*((b*c^3*d*e^2*x^4 + 2*b*c^3*d^2*e*x^2 + b*c^3*d^3)*sqrt(-c^2*d + e)*l
og(((c^4*d^2 - 8*c^2*d*e + 8*e^2)*x^4 - 2*(3*c^2*d^2 - 4*d*e)*x^2 + 4*((c^2
*d - 2*e)*x^3 - d*x)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d) + d^2)/(c^4*x^4 + 2*c
^2*x^2 + 1)) - 4*(a*c^4*d^3 - 2*a*c^2*d^2*e + a*d*e^2 + (b*c^3*d*e^2 - b*c*
e^3)*x^3 + (b*c^3*d^2*e - b*c*d*e^2)*x + (b*c^4*d^3 - 2*b*c^2*d^2*e + b*d*e
^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^4*d^5*e - 2*c^2*d^4*e^2 + d^3*e^3 + (c
^4*d^3*e^3 - 2*c^2*d^2*e^4 + d*e^5)*x^4 + 2*(c^4*d^4*e^2 - 2*c^2*d^3*e^3 +
d^2*e^4)*x^2), 1/6*((b*c^3*d*e^2*x^4 + 2*b*c^3*d^2*e*x^2 + b*c^3*d^3)*sqrt(
c^2*d - e)*arctan(1/2*sqrt(c^2*d - e)*((c^2*d - 2*e)*x^2 - d)*sqrt(e*x^2 +
d)/((c^2*d*e - e^2)*x^3 + (c^2*d^2 - d*e)*x)) - 2*(a*c^4*d^3 - 2*a*c^2*d^2*
e + a*d*e^2 + (b*c^3*d*e^2 - b*c*e^3)*x^3 + (b*c^3*d^2*e - b*c*d*e^2)*x + (
```

```
b*c^4*d^3 - 2*b*c^2*d^2*e + b*d*e^2)*arctan(c*x))*sqrt(e*x^2 + d))/(c^4*d^5
*e - 2*c^2*d^4*e^2 + d^3*e^3 + (c^4*d^3*e^3 - 2*c^2*d^2*e^4 + d*e^5)*x^4 +
2*(c^4*d^4*e^2 - 2*c^2*d^3*e^3 + d^2*e^4)*x^2)]
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] Timed out
```

maple [F] time = 0.92, size = 0, normalized size = 0.00

$$\int \frac{x\,(a+b\arctan(cx))}{\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
[Out] int(x*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(e-c^2*d>0)', see `assume?` for more
 details)Is e-c^2*d positive, negative or zero?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x)))/(d + e*x^2)^(5/2),x)
[Out] int((x*(a + b*atan(c*x)))/(d + e*x^2)^(5/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(cx))}{\left(d+ex^2\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))/(e*x**2+d)**(5/2),x)
[Out] Integral(x*(a + b*atan(c*x))/(d + e*x**2)**(5/2), x)
```

3.1221 $\int \frac{a+b\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=144

$$\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{b\left(3c^2d-2e\right)\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d^2\left(c^2d-e\right)^{3/2}}-\frac{bc}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}$$

```
[Out] 1/3*x*(a+b*arctan(c*x))/d/(e*x^2+d)^(3/2)+1/3*b*(3*c^2*d-2*e)*arctanh(c*(e*
x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d^2/(c^2*d-e)^(3/2)-1/3*b*c/d/(c^2*d-e)/(e*x^
2+d)^(1/2)+2/3*x*(a+b*arctan(c*x))/d^2/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.31, antiderivative size = 144, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 9, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.450, Rules used = {192, 191, 4912, 6688, 12, 571, 78, 63, 208}

$$\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{b\left(3c^2d-2e\right)\tanh^{-1}\left(\frac{c\sqrt{d+ex^2}}{\sqrt{c^2d-e}}\right)}{3d^2\left(c^2d-e\right)^{3/2}}-\frac{bc}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] -(b*c)/(3*d*(c^2*d - e)*Sqrt[d + e*x^2]) + (x*(a + b*ArcTan[c*x]))/(3*d*(d
+ e*x^2)^(3/2)) + (2*x*(a + b*ArcTan[c*x]))/(3*d^2*Sqrt[d + e*x^2]) + (b*(3
*c^2*d - 2*e)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(3*d^2*(c^2*d -
 e)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 78

```
Int[((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p
_.), x_Symbol] :> -Simp[((b*e - a*f)*(c + d*x)^(n + 1)*(e + f*x)^(p + 1))/(
f*(p + 1)*(c*f - d*e)), x] - Dist[(a*d*f*(n + p + 2) - b*(d*e*(n + 1) + c*f
*(p + 1)))/(f*(p + 1)*(c*f - d*e)), Int[(c + d*x)^n*(e + f*x)^(p + 1), x],
x] /; FreeQ[{a, b, c, d, e, f, n}, x] && LtQ[p, -1] && ( !LtQ[n, -1] || Int
egerQ[p] ||  !(IntegerQ[n] ||  !(EqQ[e, 0] ||  !(EqQ[c, 0] || LtQ[p, n]))))
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 571

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
)*((e_) + (f_.)*(x_)^(n_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x
)^p*(c + d*x)^q*(e + f*x)^r, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, f, m,
 n, p, q, r}, x] && EqQ[m - n + 1, 0]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{\left(d+ex^2\right)^{5/2}}\,dx = \frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}-(bc)\int \frac{\frac{x}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x}{3d^2\sqrt{d+ex^2}}}{1+c^2x^2}\,dx$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}-(bc)\int \frac{x\left(3d+2ex^2\right)}{3d^2\left(1+c^2x^2\right)\left(d+ex^2\right)^{3/2}}\,dx$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}-\frac{(bc)\int \frac{x\left(3d+2ex^2\right)}{\left(1+c^2x^2\right)\left(d+ex^2\right)^{3/2}}\,dx}{3d^2}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}-\frac{(bc)\,\mathrm{Subst}\left(\int \frac{3d+2ex}{\left(1+c^2x\right)(d+ex)^{3/2}}\,dx,x,x^2\right)}{6d^2}$$

$$= -\frac{bc}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}-\frac{\left(bc\left(3c^2d-2e\right)\right)}{}$$

$$= -\frac{bc}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}-\frac{\left(bc\left(3c^2d-2e\right)\right)}{}$$

$$= -\frac{bc}{3d\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{x\left(a+b\tan^{-1}(cx)\right)}{3d\left(d+ex^2\right)^{3/2}}+\frac{2x\left(a+b\tan^{-1}(cx)\right)}{3d^2\sqrt{d+ex^2}}+\frac{b\left(3c^2d-2e\right)\tan}{3d^2\left(c^2d\right.}$$

Mathematica [C] time = 0.60, size = 317, normalized size = 2.20

$$\frac{2\sqrt{c^2d-e}\left(ax\left(c^2d-e\right)\left(3d+2ex^2\right)-bcd\left(d+ex^2\right)\right)+b\left(3c^2d-2e\right)\left(d+ex^2\right)^{3/2}\log\left(-\frac{12cd^2\sqrt{c^2d-e}\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+c\right.}{b(cx+i)\left(3c^2d-2e\right)}\right.}{6d^2\left(c^2d-e\right)}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(d + e*x^2)^(5/2),x]
```

```
[Out] (2*Sqrt[c^2*d - e]*(-(b*c*d*(d + e*x^2)) + a*(c^2*d - e)*x*(3*d + 2*e*x^2))
 + 2*b*(c^2*d - e)^(3/2)*x*(3*d + 2*e*x^2)*ArcTan[c*x] + b*(3*c^2*d - 2*e)*
(d + e*x^2)^(3/2)*Log[(-12*c*d^2*Sqrt[c^2*d - e]*(c*d - I*e*x + Sqrt[c^2*d
- e]*Sqrt[d + e*x^2]))/(b*(3*c^2*d - 2*e)*(I + c*x))] + b*(3*c^2*d - 2*e)*(
d + e*x^2)^(3/2)*Log[(-12*c*d^2*Sqrt[c^2*d - e]*(c*d + I*e*x + Sqrt[c^2*d -
 e]*Sqrt[d + e*x^2]))/(b*(3*c^2*d - 2*e)*(-I + c*x))])/(6*d^2*(c^2*d - e)^(
3/2)*(d + e*x^2)^(3/2))
```

fricas [B] time = 0.99, size = 864, normalized size = 6.00

$$\left[\frac{\left(3\,bc^2d^3+\left(3\,bc^2de^2-2\,be^3\right)x^4-2\,bd^2e+2\left(3\,bc^2d^2e-2\,bde^2\right)x^2\right)\sqrt{c^2d-e}\,\log\left(\frac{c^4e^2x^4+8\,c^4d^2-8\,c^2de+2\left(4\,c^4de-3\,c^2e^2\right)x^2}{c^4x^4+2}\right.}{}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [1/12*((3*b*c^2*d^3 + (3*b*c^2*d*e^2 - 2*b*e^3)*x^4 - 2*b*d^2*e + 2*(3*b*c^
2*d^2*e - 2*b*d*e^2)*x^2)*sqrt(c^2*d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*
c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqr
t(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 4*(b*c^3*d
^3 - b*c*d^2*e - 2*(a*c^4*d^2*e - 2*a*c^2*d*e^2 + a*e^3)*x^3 + (b*c^3*d^2*e
 - b*c*d*e^2)*x^2 - 3*(a*c^4*d^3 - 2*a*c^2*d^2*e + a*d*e^2)*x - (2*(b*c^4*d
^2*e - 2*b*c^2*d*e^2 + b*e^3)*x^3 + 3*(b*c^4*d^3 - 2*b*c^2*d^2*e + b*d*e^2)
*x)*arctan(c*x))*sqrt(e*x^2 + d))/(c^4*d^6 - 2*c^2*d^5*e + d^4*e^2 + (c^4*d
^4*e^2 - 2*c^2*d^3*e^3 + d^2*e^4)*x^4 + 2*(c^4*d^5*e - 2*c^2*d^4*e^2 + d^3*
e^3)*x^2), 1/6*((3*b*c^2*d^3 + (3*b*c^2*d*e^2 - 2*b*e^3)*x^4 - 2*b*d^2*e +
2*(3*b*c^2*d^2*e - 2*b*d*e^2)*x^2)*sqrt(-c^2*d + e)*arctan(-1/2*(c^2*e*x^2
+ 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e
 - c*e^2)*x^2)) - 2*(b*c^3*d^3 - b*c*d^2*e - 2*(a*c^4*d^2*e - 2*a*c^2*d*e^2
 + a*e^3)*x^3 + (b*c^3*d^2*e - b*c*d*e^2)*x^2 - 3*(a*c^4*d^3 - 2*a*c^2*d^2*
e + a*d*e^2)*x - (2*(b*c^4*d^2*e - 2*b*c^2*d*e^2 + b*e^3)*x^3 + 3*(b*c^4*d^
3 - 2*b*c^2*d^2*e + b*d*e^2)*x)*arctan(c*x))*sqrt(e*x^2 + d))/(c^4*d^6 - 2*
c^2*d^5*e + d^4*e^2 + (c^4*d^4*e^2 - 2*c^2*d^3*e^3 + d^2*e^4)*x^4 + 2*(c^4*
d^5*e - 2*c^2*d^4*e^2 + d^3*e^3)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 2.00, size = 0, normalized size = 0.00

$$\int \frac{a + b \arctan (cx)}{\left(e\,x^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}\,a\left(\frac{2\,x}{\sqrt{ex^2 + d}\,d^2} + \frac{x}{\left(ex^2 + d\right)^{\frac{3}{2}}d}\right) + 2\,b\int \frac{\arctan (cx)}{2\left(e^2x^4 + 2\,dex^2 + d^2\right)\sqrt{ex^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(2*x/(sqrt(e*x^2 + d)*d^2) + x/((e*x^2 + d)^(3/2)*d)) + 2*b*integrate
(1/2*arctan(c*x)/((e^2*x^4 + 2*d*e*x^2 + d^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a + b\,\mathrm{atan}\left(c\,x\right)}{\left(e\,x^2 + d\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((a + b*atan(c*x))/(d + e*x^2)^(5/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.1222 $\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=86

$$b\text{Int}\left(\frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}},x\right)-\frac{a\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+\frac{a}{d^2\sqrt{d+ex^2}}+\frac{a}{3d\left(d+ex^2\right)^{3/2}}$$

```
[Out] 1/3*a/d/(e*x^2+d)^(3/2)-a*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)+a/d^2/(e
*x^2+d)^(1/2)+b*Unintegrable(arctan(c*x)/x/(e*x^2+d)^(5/2),x)
```

Rubi [A] time = 0.19, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^(5/2)),x]
```

```
[Out] a/(3*d*(d + e*x^2)^(3/2)) + a/(d^2*Sqrt[d + e*x^2]) - (a*ArcTanh[Sqrt[d + e
*x^2]/Sqrt[d]])/d^(5/2) + b*Defer[Int][ArcTan[c*x]/(x*(d + e*x^2)^(5/2)), x
]
```

Rubi steps

$$\begin{aligned}
\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx &= a\int \frac{1}{x\left(d+ex^2\right)^{5/2}}\,dx+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx\\
&= \frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x(d+ex)^{5/2}}\,dx,x,x^2\right)+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx\\
&= \frac{a}{3d\left(d+ex^2\right)^{3/2}}+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{x(d+ex)^{3/2}}\,dx,x,x^2\right)}{2d}\\
&= \frac{a}{3d\left(d+ex^2\right)^{3/2}}+\frac{a}{d^2\sqrt{d+ex^2}}+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{x\sqrt{d+ex}}\,dx,x,x^2\right)}{2d^2}\\
&= \frac{a}{3d\left(d+ex^2\right)^{3/2}}+\frac{a}{d^2\sqrt{d+ex^2}}+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx+\frac{a\,\text{Subst}\left(\int \frac{1}{-\frac{d}{e}+\frac{x^2}{e}}\,dx,x,\sqrt{d-}\right.}{d^2e}\\
&= \frac{a}{3d\left(d+ex^2\right)^{3/2}}+\frac{a}{d^2\sqrt{d+ex^2}}-\frac{a\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{d^{5/2}}+b\int \frac{\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx
\end{aligned}$$

Mathematica [A] time = 57.97, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan^{-1}(cx)}{x\left(d+ex^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^(5/2)),x]
```

```
[Out] Integrate[(a + b*ArcTan[c*x])/(x*(d + e*x^2)^(5/2)), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{e^3x^7+3\,de^2x^5+3\,d^2ex^3+d^3x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/(e^3*x^7 + 3*d*e^2*x^5 + 3*d^2
*e*x^3 + d^3*x), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 1.02, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan(cx)}{x\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x/(e*x^2+d)^(5/2),x)
```

```
[Out] int((a+b*arctan(c*x))/x/(e*x^2+d)^(5/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}a\left(\frac{3\,\text{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{5}{2}}}-\frac{3}{\sqrt{ex^2+d}\,d^2}-\frac{1}{\left(ex^2+d\right)^{\frac{3}{2}}d}\right)+2\,b\int\frac{\arctan(cx)}{2\left(e^2x^5+2\,dex^3+d^2x\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] -1/3*a*(3*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(5/2) - 3/(sqrt(e*x^2 + d)*d^2) -
 1/((e*x^2 + d)^(3/2)*d)) + 2*b*integrate(1/2*arctan(c*x)/((e^2*x^5 + 2*d*e
*x^3 + d^2*x)*sqrt(e*x^2 + d)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x\,{\left(e\,x^2+d\right)}^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x*(d + e*x^2)^(5/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.1223 $\int \frac{a+b\tan^{-1}(cx)}{x^2\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=274

$$-\frac{8ex\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}}-\frac{4ex\left(a+b\tan^{-1}(cx)\right)}{3d^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}}-\frac{b\left(3c^4d^2-12c^2de+8e^2\right)}{3cd^3\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{b\left(3c^4d^2-12c^2de+8\right.}{3d^3\left(c^2d\right.}$$

```
[Out] (-a-b*arctan(c*x))/d/x/(e*x^2+d)^(3/2)-4/3*e*x*(a+b*arctan(c*x))/d^2/(e*x^2
+d)^(3/2)-b*c*arctanh((e*x^2+d)^(1/2)/d^(1/2))/d^(5/2)+1/3*b*(3*c^4*d^2-12*
c^2*d*e+8*e^2)*arctanh(c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d^3/(c^2*d-e)^(3/
2)+b*c/d^2/(e*x^2+d)^(1/2)-8/3*b*e/c/d^3/(e*x^2+d)^(1/2)-1/3*b*(3*c^4*d^2-1
2*c^2*d*e+8*e^2)/c/d^3/(c^2*d-e)/(e*x^2+d)^(1/2)-8/3*e*x*(a+b*arctan(c*x))/
d^3/(e*x^2+d)^(1/2)
```

Rubi [A] time = 0.93, antiderivative size = 274, normalized size of antiderivative = 1.00, number of steps used = 13, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {271, 192, 191, 4976, 12, 6725, 266, 51, 63, 208, 261, 444}

$$-\frac{8ex\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}}-\frac{4ex\left(a+b\tan^{-1}(cx)\right)}{3d^2\left(d+ex^2\right)^{3/2}}-\frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}}-\frac{b\left(3c^4d^2-12c^2de+8e^2\right)}{3cd^3\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{b\left(3c^4d^2-12c^2de+8\right.}{3d^3\left(c^2d\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^(5/2)),x]
```

```
[Out] (b*c)/(d^2*Sqrt[d + e*x^2]) - (8*b*e)/(3*c*d^3*Sqrt[d + e*x^2]) - (b*(3*c^4
*d^2 - 12*c^2*d*e + 8*e^2))/(3*c*d^3*(c^2*d - e)*Sqrt[d + e*x^2]) - (a + b*
ArcTan[c*x])/(d*x*(d + e*x^2)^(3/2)) - (4*e*x*(a + b*ArcTan[c*x]))/(3*d^2*(
d + e*x^2)^(3/2)) - (8*e*x*(a + b*ArcTan[c*x]))/(3*d^3*Sqrt[d + e*x^2]) - (
b*c*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/d^(5/2) + (b*(3*c^4*d^2 - 12*c^2*d*e
+ 8*e^2)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e]])/(3*d^3*(c^2*d - e)^(
3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^2\left(d+ex^2\right)^{5/2}}\,dx = -\frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\tan^{-1}(cx)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} - (bc)\int \frac{-3d^2-12d}{3d^3x\left(1+c^2x\right.}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\tan^{-1}(cx)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} - \frac{(bc)\int \frac{-3d^2-12dex^2-8e^2}{x\left(1+c^2x^2\right)\left(d+ex^2\right)}}{3d^3}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\tan^{-1}(cx)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} - \frac{(bc)\int\left(-\frac{3d^2}{x\left(d+ex^2\right)^{3/2}} -\right.}{}$$

$$= -\frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\tan^{-1}(cx)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} + \frac{(bc)\int \frac{1}{x\left(d+ex^2\right)^{3/2}}\,dx}{d}$$

$$= -\frac{8be}{3cd^3\sqrt{d+ex^2}} - \frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\tan^{-1}(cx)\right)}{3d^2\left(d+ex^2\right)^{3/2}} - \frac{8ex\left(a+b\tan^{-1}(cx)\right)}{3d^3\sqrt{d+ex^2}} + \frac{(bc}{}$$

$$= \frac{bc}{d^2\sqrt{d+ex^2}} - \frac{8be}{3cd^3\sqrt{d+ex^2}} - \frac{b\left(3c^4d^2-12c^2de+8e^2\right)}{3cd^3\left(c^2d-e\right)\sqrt{d+ex^2}} - \frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\right.}{3d^2\left(d+\right.}$$

$$= \frac{bc}{d^2\sqrt{d+ex^2}} - \frac{8be}{3cd^3\sqrt{d+ex^2}} - \frac{b\left(3c^4d^2-12c^2de+8e^2\right)}{3cd^3\left(c^2d-e\right)\sqrt{d+ex^2}} - \frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\right.}{3d^2\left(d+\right.}$$

$$= \frac{bc}{d^2\sqrt{d+ex^2}} - \frac{8be}{3cd^3\sqrt{d+ex^2}} - \frac{b\left(3c^4d^2-12c^2de+8e^2\right)}{3cd^3\left(c^2d-e\right)\sqrt{d+ex^2}} - \frac{a+b\tan^{-1}(cx)}{dx\left(d+ex^2\right)^{3/2}} - \frac{4ex\left(a+b\right.}{3d^2\left(d+\right.}$$

Mathematica [C] time = 1.18, size = 418, normalized size = 1.53

$$\frac{\frac{2e\left(5ax\left(e-c^2d\right)+bcd\right)}{\left(c^2d-e\right)\sqrt{d+ex^2}} - \frac{6a\sqrt{d+ex^2}}{x} - \frac{2adex}{\left(d+ex^2\right)^{3/2}} + \frac{b\left(3c^4d^2-12c^2de+8e^2\right)\log\left(-\frac{12cd^3\sqrt{c^2d-e}\left(\sqrt{c^2d-e}\sqrt{d+ex^2}+cd-iex\right)}{b(cx+i)\left(3c^4d^2-12c^2de+8e^2\right)}\right)}{\left(c^2d-e\right)^{3/2}} + \frac{b\left(3c^4d^2-12c^2de+8e^2\right)\log\left(\right.}{}}{6d^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^2*(d + e*x^2)^(5/2)),x]
```

```
[Out] ((-2*a*d*e*x)/(d + e*x^2)^(3/2) + (2*e*(b*c*d + 5*a*(-(c^2*d) + e)*x))/((c^
2*d - e)*Sqrt[d + e*x^2]) - (6*a*Sqrt[d + e*x^2])/x - (2*b*(3*d^2 + 12*d*e*
x^2 + 8*e^2*x^4)*ArcTan[c*x])/(x*(d + e*x^2)^(3/2)) + 6*b*c*Sqrt[d]*Log[x]
- 6*b*c*Sqrt[d]*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] + (b*(3*c^4*d^2 - 12*c^2*d
*e + 8*e^2)*Log[(-12*c*d^3*Sqrt[c^2*d - e]*(c*d - I*e*x + Sqrt[c^2*d - e]*S
qrt[d + e*x^2]))/(b*(3*c^4*d^2 - 12*c^2*d*e + 8*e^2)*(I + c*x))])/(c^2*d -
e)^(3/2) + (b*(3*c^4*d^2 - 12*c^2*d*e + 8*e^2)*Log[(-12*c*d^3*Sqrt[c^2*d -
e]*(c*d + I*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(3*c^4*d^2 - 12*c^2*
d*e + 8*e^2)*(-I + c*x))])/(c^2*d - e)^(3/2))/(6*d^3)
```

fricas [B] time = 2.14, size = 2714, normalized size = 9.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/12*(((3*b*c^4*d^2*e^2 - 12*b*c^2*d*e^3 + 8*b*e^4)*x^5 + 2*(3*b*c^4*d^3*
e - 12*b*c^2*d^2*e^2 + 8*b*d*e^3)*x^3 + (3*b*c^4*d^4 - 12*b*c^2*d^3*e + 8*b
*d^2*e^2)*x)*sqrt(c^2*d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(
4*c^4*d*e - 3*c^2*e^2)*x^2 - 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*
sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) - 6*((b*c^5*d^2*e^2 - 2*b
*c^3*d*e^3 + b*c*e^4)*x^5 + 2*(b*c^5*d^3*e - 2*b*c^3*d^2*e^2 + b*c*d*e^3)*x
^3 + (b*c^5*d^4 - 2*b*c^3*d^3*e + b*c*d^2*e^2)*x)*sqrt(d)*log(-(e*x^2 - 2*s
qrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 4*(3*a*c^4*d^4 - 6*a*c^2*d^3*e + 3*a*d
^2*e^2 + 8*(a*c^4*d^2*e^2 - 2*a*c^2*d*e^3 + a*e^4)*x^4 - (b*c^3*d^2*e^2 - b
*c*d*e^3)*x^3 + 12*(a*c^4*d^3*e - 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2 - (b*c^3*d
^3*e - b*c*d^2*e^2)*x + (3*b*c^4*d^4 - 6*b*c^2*d^3*e + 3*b*d^2*e^2 + 8*(b*c
^4*d^2*e^2 - 2*b*c^2*d*e^3 + b*e^4)*x^4 + 12*(b*c^4*d^3*e - 2*b*c^2*d^2*e^2
 + b*d*e^3)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/((c^4*d^5*e^2 - 2*c^2*d^4*e^
3 + d^3*e^4)*x^5 + 2*(c^4*d^6*e - 2*c^2*d^5*e^2 + d^4*e^3)*x^3 + (c^4*d^7 -
 2*c^2*d^6*e + d^5*e^2)*x), 1/6*(((3*b*c^4*d^2*e^2 - 12*b*c^2*d*e^3 + 8*b*e
^4)*x^5 + 2*(3*b*c^4*d^3*e - 12*b*c^2*d^2*e^2 + 8*b*d*e^3)*x^3 + (3*b*c^4*d
^4 - 12*b*c^2*d^3*e + 8*b*d^2*e^2)*x)*sqrt(-c^2*d + e)*arctan(-1/2*(c^2*e*x
^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*
d*e - c*e^2)*x^2)) + 3*((b*c^5*d^2*e^2 - 2*b*c^3*d*e^3 + b*c*e^4)*x^5 + 2*(
b*c^5*d^3*e - 2*b*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^5*d^4 - 2*b*c^3*d^3*e
 + b*c*d^2*e^2)*x)*sqrt(d)*log(-(e*x^2 - 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x
^2) - 2*(3*a*c^4*d^4 - 6*a*c^2*d^3*e + 3*a*d^2*e^2 + 8*(a*c^4*d^2*e^2 - 2*a
*c^2*d*e^3 + a*e^4)*x^4 - (b*c^3*d^2*e^2 - b*c*d*e^3)*x^3 + 12*(a*c^4*d^3*e
 - 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2 - (b*c^3*d^3*e - b*c*d^2*e^2)*x + (3*b*c^
4*d^4 - 6*b*c^2*d^3*e + 3*b*d^2*e^2 + 8*(b*c^4*d^2*e^2 - 2*b*c^2*d*e^3 + b*
e^4)*x^4 + 12*(b*c^4*d^3*e - 2*b*c^2*d^2*e^2 + b*d*e^3)*x^2)*arctan(c*x))*s
qrt(e*x^2 + d))/((c^4*d^5*e^2 - 2*c^2*d^4*e^3 + d^3*e^4)*x^5 + 2*(c^4*d^6*e
 - 2*c^2*d^5*e^2 + d^4*e^3)*x^3 + (c^4*d^7 - 2*c^2*d^6*e + d^5*e^2)*x), 1/1
2*(12*((b*c^5*d^2*e^2 - 2*b*c^3*d*e^3 + b*c*e^4)*x^5 + 2*(b*c^5*d^3*e - 2*b
*c^3*d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^5*d^4 - 2*b*c^3*d^3*e + b*c*d^2*e^2)*x
)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - ((3*b*c^4*d^2*e^2 - 12*b*c^2*
d*e^3 + 8*b*e^4)*x^5 + 2*(3*b*c^4*d^3*e - 12*b*c^2*d^2*e^2 + 8*b*d*e^3)*x^3
 + (3*b*c^4*d^4 - 12*b*c^2*d^3*e + 8*b*d^2*e^2)*x)*sqrt(c^2*d - e)*log((c^4
*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)*x^2 - 4*(c^3*e
*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c
^2*x^2 + 1)) - 4*(3*a*c^4*d^4 - 6*a*c^2*d^3*e + 3*a*d^2*e^2 + 8*(a*c^4*d^2*
e^2 - 2*a*c^2*d*e^3 + a*e^4)*x^4 - (b*c^3*d^2*e^2 - b*c*d*e^3)*x^3 + 12*(a*
c^4*d^3*e - 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2 - (b*c^3*d^3*e - b*c*d^2*e^2)*x
+ (3*b*c^4*d^4 - 6*b*c^2*d^3*e + 3*b*d^2*e^2 + 8*(b*c^4*d^2*e^2 - 2*b*c^2*d
*e^3 + b*e^4)*x^4 + 12*(b*c^4*d^3*e - 2*b*c^2*d^2*e^2 + b*d*e^3)*x^2)*arcta
n(c*x))*sqrt(e*x^2 + d))/((c^4*d^5*e^2 - 2*c^2*d^4*e^3 + d^3*e^4)*x^5 + 2*(
c^4*d^6*e - 2*c^2*d^5*e^2 + d^4*e^3)*x^3 + (c^4*d^7 - 2*c^2*d^6*e + d^5*e^2
)*x), 1/6*(((3*b*c^4*d^2*e^2 - 12*b*c^2*d*e^3 + 8*b*e^4)*x^5 + 2*(3*b*c^4*d
^3*e - 12*b*c^2*d^2*e^2 + 8*b*d*e^3)*x^3 + (3*b*c^4*d^4 - 12*b*c^2*d^3*e +
8*b*d^2*e^2)*x)*sqrt(-c^2*d + e)*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt
(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) + 6
*((b*c^5*d^2*e^2 - 2*b*c^3*d*e^3 + b*c*e^4)*x^5 + 2*(b*c^5*d^3*e - 2*b*c^3*
d^2*e^2 + b*c*d*e^3)*x^3 + (b*c^5*d^4 - 2*b*c^3*d^3*e + b*c*d^2*e^2)*x)*sqr
t(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) - 2*(3*a*c^4*d^4 - 6*a*c^2*d^3*e + 3
*a*d^2*e^2 + 8*(a*c^4*d^2*e^2 - 2*a*c^2*d*e^3 + a*e^4)*x^4 - (b*c^3*d^2*e^2
 - b*c*d*e^3)*x^3 + 12*(a*c^4*d^3*e - 2*a*c^2*d^2*e^2 + a*d*e^3)*x^2 - (b*c
^3*d^3*e - b*c*d^2*e^2)*x + (3*b*c^4*d^4 - 6*b*c^2*d^3*e + 3*b*d^2*e^2 + 8*
(b*c^4*d^2*e^2 - 2*b*c^2*d*e^3 + b*e^4)*x^4 + 12*(b*c^4*d^3*e - 2*b*c^2*d^2
*e^2 + b*d*e^3)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/((c^4*d^5*e^2 - 2*c^2*d^
4*e^3 + d^3*e^4)*x^5 + 2*(c^4*d^6*e - 2*c^2*d^5*e^2 + d^4*e^3)*x^3 + (c^4*d
^7 - 2*c^2*d^6*e + d^5*e^2)*x)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 1.04, size = 0, normalized size = 0.00

$$\int \frac{a + b\arctan(cx)}{x^2 \left(e\,x^2 + d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^(5/2),x)
[Out] int((a+b*arctan(c*x))/x^2/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{3}\,a\left(\frac{8\,ex}{\sqrt{ex^2+d}\,d^3} + \frac{4\,ex}{\left(ex^2+d\right)^{\frac{3}{2}}d^2} + \frac{3}{\left(ex^2+d\right)^{\frac{3}{2}}dx}\right) + 2\,b\int \frac{\arctan(cx)}{2\left(e^2x^6 + 2\,dex^4 + d^2x^2\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^2/(e*x^2+d)^(5/2),x, algorithm="maxima")
[Out] -1/3*a*(8*e*x/(sqrt(e*x^2 + d)*d^3) + 4*e*x/((e*x^2 + d)^(3/2)*d^2) + 3/((e
*x^2 + d)^(3/2)*d*x)) + 2*b*integrate(1/2*arctan(c*x)/((e^2*x^6 + 2*d*e*x^4
 + d^2*x^2)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a + b\,\mathrm{atan}(c\,x)}{x^2 \left(e\,x^2 + d\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^(5/2)),x)
[Out] int((a + b*atan(c*x))/(x^2*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**2/(e*x**2+d)**(5/2),x)
[Out] Timed out
```

3.1224 $\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx$

Optimal. Leaf size=116

$$b\text{Int}\left(\frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}},x\right)+\frac{5ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2d^{7/2}}-\frac{5ae}{2d^3\sqrt{d+ex^2}}-\frac{5ae}{6d^2\left(d+ex^2\right)^{3/2}}-\frac{a}{2dx^2\left(d+ex^2\right)^{3/2}}$$

```
[Out] -5/6*a*e/d^2/(e*x^2+d)^(3/2)-1/2*a/d/x^2/(e*x^2+d)^(3/2)+5/2*a*e*arctanh((e
*x^2+d)^(1/2)/d^(1/2))/d^(7/2)-5/2*a*e/d^3/(e*x^2+d)^(1/2)+b*Unintegrable(a
rctan(c*x)/x^3/(e*x^2+d)^(5/2),x)
```

Rubi [A] time = 0.21, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^(5/2)),x]
```

```
[Out] a/(3*d*x^2*(d + e*x^2)^(3/2)) + (5*a)/(3*d^2*x^2*Sqrt[d + e*x^2]) - (5*a*Sq
rt[d + e*x^2])/(2*d^3*x^2) + (5*a*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(2*d^
(7/2)) + b*Defer[Int][ArcTan[c*x]/(x^3*(d + e*x^2)^(5/2)), x]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx = a\int \frac{1}{x^3\left(d+ex^2\right)^{5/2}}\,dx+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx$$

$$=\frac{1}{2}a\,\text{Subst}\left(\int \frac{1}{x^2(d+ex)^{5/2}}\,dx,x,x^2\right)+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx$$

$$=\frac{a}{3dx^2\left(d+ex^2\right)^{3/2}}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx+\frac{(5a)\,\text{Subst}\left(\int \frac{1}{x^2(d+ex)^{3/2}}\,dx,x,x^2\right)}{6d}$$

$$=\frac{a}{3dx^2\left(d+ex^2\right)^{3/2}}+\frac{5a}{3d^2x^2\sqrt{d+ex^2}}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx+\frac{(5a)\,\text{Subst}\left(\int \frac{1}{x^2\sqrt{d+ex}}\right.}{2d^2}$$

$$=\frac{a}{3dx^2\left(d+ex^2\right)^{3/2}}+\frac{5a}{3d^2x^2\sqrt{d+ex^2}}-\frac{5a\sqrt{d+ex^2}}{2d^3x^2}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx-\frac{(5ae)\,\text{S}}{}$$

$$=\frac{a}{3dx^2\left(d+ex^2\right)^{3/2}}+\frac{5a}{3d^2x^2\sqrt{d+ex^2}}-\frac{5a\sqrt{d+ex^2}}{2d^3x^2}+b\int \frac{\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx-\frac{(5a)\,\text{Su}}{}$$

$$=\frac{a}{3dx^2\left(d+ex^2\right)^{3/2}}+\frac{5a}{3d^2x^2\sqrt{d+ex^2}}-\frac{5a\sqrt{d+ex^2}}{2d^3x^2}+\frac{5ae\tanh^{-1}\left(\frac{\sqrt{d+ex^2}}{\sqrt{d}}\right)}{2d^{7/2}}+b\int \frac{\text{t}}{x^3(}$$

Mathematica [A] time = 61.44, size = 0, normalized size = 0.00

$$\int \frac{a+b\tan^{-1}(cx)}{x^3\left(d+ex^2\right)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^(5/2)),x]
[Out] Integrate[(a + b*ArcTan[c*x])/(x^3*(d + e*x^2)^(5/2)), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)}{e^3x^9+3\,de^2x^7+3\,d^2ex^5+d^3x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(5/2),x, algorithm="fricas")
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)/(e^3*x^9 + 3*d*e^2*x^7 + 3*d^2
*e*x^5 + d^3*x^3), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [A] time = 1.02, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan(cx)}{x^3\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^(5/2),x)
[Out] int((a+b*arctan(c*x))/x^3/(e*x^2+d)^(5/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\,a\left(\frac{15\,e\,\mathrm{arsinh}\left(\frac{d}{\sqrt{de}\,|x|}\right)}{d^{\frac{7}{2}}}-\frac{15\,e}{\sqrt{ex^2+d}\,d^3}-\frac{5\,e}{\left(ex^2+d\right)^{\frac{3}{2}}d^2}-\frac{3}{\left(ex^2+d\right)^{\frac{3}{2}}dx^2}\right)+2\,b\int \frac{\arctan(cx)}{2\left(e^2x^7+2\,dex^5+d^2x^3\right)\sqrt{ex^2+}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^3/(e*x^2+d)^(5/2),x, algorithm="maxima")
[Out] 1/6*a*(15*e*arcsinh(d/(sqrt(d*e)*abs(x)))/d^(7/2) - 15*e/(sqrt(e*x^2 + d)*d
^3) - 5*e/((e*x^2 + d)^(3/2)*d^2) - 3/((e*x^2 + d)^(3/2)*d*x^2)) + 2*b*inte
grate(1/2*arctan(c*x)/((e^2*x^7 + 2*d*e*x^5 + d^2*x^3)*sqrt(e*x^2 + d)), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{a+b\,\mathrm{atan}(c\,x)}{x^3\left(e\,x^2+d\right)^{5/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^(5/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^3*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**3/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.1225 $\int \frac{a+b\tan^{-1}(cx)}{x^4(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=423

$$\frac{16e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^4\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^2x\left(d+ex^2\right)^{3/2}}-\frac{a+b\tan^{-1}(cx)}{3dx^3\left(d+ex^2\right)^{3/2}}+\frac{bc\left(c^2d+6e\right)\tanh^{-1}\left(\right.}{3d^{7/2}}$$

```
[Out] 1/3*(-a-b*arctan(c*x))/d/x^3/(e*x^2+d)^(3/2)+2*e*(a+b*arctan(c*x))/d^2/x/(e
*x^2+d)^(3/2)+8/3*e^2*x*(a+b*arctan(c*x))/d^3/(e*x^2+d)^(3/2)+1/2*b*c*e*arc
tanh((e*x^2+d)^(1/2)/d^(1/2))/d^(7/2)+1/3*b*c*(c^2*d+6*e)*arctanh((e*x^2+d)
^(1/2)/d^(1/2))/d^(7/2)-1/3*b*(c^2*d-2*e)*(c^4*d^2+8*c^2*d*e-8*e^2)*arctanh
(c*(e*x^2+d)^(1/2)/(c^2*d-e)^(1/2))/d^4/(c^2*d-e)^(3/2)-1/2*b*c*e/d^3/(e*x^
2+d)^(1/2)+16/3*b*e^2/c/d^4/(e*x^2+d)^(1/2)-1/3*b*c*(c^2*d+6*e)/d^3/(e*x^2+
d)^(1/2)+1/3*b*(c^2*d-2*e)*(c^4*d^2+8*c^2*d*e-8*e^2)/c/d^4/(c^2*d-e)/(e*x^2
+d)^(1/2)-1/6*b*c/d^2/x^2/(e*x^2+d)^(1/2)+16/3*e^2*x*(a+b*arctan(c*x))/d^4/
(e*x^2+d)^(1/2)
```

Rubi [A] time = 1.10, antiderivative size = 425, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {271, 192, 191, 4976, 12, 6725, 266, 51, 63, 208, 261, 444}

$$\frac{16e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^4\sqrt{d+ex^2}}+\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^2x\left(d+ex^2\right)^{3/2}}-\frac{a+b\tan^{-1}(cx)}{3dx^3\left(d+ex^2\right)^{3/2}}+\frac{b\left(c^2d-2e\right)\left(c^4d^2+8c\right.}{3cd^4\left(c^2d-e\right)\sqrt{d}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])/(x^4*(d + e*x^2)^(5/2)),x]
```

```
[Out] (16*b*e^2)/(3*c*d^4*Sqrt[d + e*x^2]) - (b*c*(c^2*d + 6*e))/(3*d^3*Sqrt[d +
e*x^2]) + (b*(c^2*d - 2*e)*(c^4*d^2 + 8*c^2*d*e - 8*e^2))/(3*c*d^4*(c^2*d -
 e)*Sqrt[d + e*x^2]) + (b*c)/(3*d^2*x^2*Sqrt[d + e*x^2]) - (b*c*Sqrt[d + e*
x^2])/(2*d^3*x^2) - (a + b*ArcTan[c*x])/(3*d*x^3*(d + e*x^2)^(3/2)) + (2*e*
(a + b*ArcTan[c*x]))/(d^2*x*(d + e*x^2)^(3/2)) + (8*e^2*x*(a + b*ArcTan[c*x
]))/(3*d^3*(d + e*x^2)^(3/2)) + (16*e^2*x*(a + b*ArcTan[c*x]))/(3*d^4*Sqrt[
d + e*x^2]) + (b*c*e*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(2*d^(7/2)) + (b*c*(
c^2*d + 6*e)*ArcTanh[Sqrt[d + e*x^2]/Sqrt[d]])/(3*d^(7/2)) - (b*(c^2*d - 2*
e)*(c^4*d^2 + 8*c^2*d*e - 8*e^2)*ArcTanh[(c*Sqrt[d + e*x^2])/Sqrt[c^2*d - e
]])/(3*d^4*(c^2*d - e)^(3/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 51

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> Simp[
((a + b*x)^(m + 1)*(c + d*x)^(n + 1))/((b*c - a*d)*(m + 1)), x] - Dist[(d*(
m + n + 2))/((b*c - a*d)*(m + 1)), Int[(a + b*x)^(m + 1)*(c + d*x)^n, x], x
] /; FreeQ[{a, b, c, d, n}, x] && NeQ[b*c - a*d, 0] && LtQ[m, -1] &&  !(LtQ
[n, -1] && (EqQ[a, 0] || (NeQ[c, 0] && LtQ[m - n, 0] && IntegerQ[n]))) && I
ntLinearQ[a, b, c, d, m, n, x]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 261

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a + b*x^n)
^(p + 1)/(b*n*(p + 1)), x] /; FreeQ[{a, b, m, n, p}, x] && EqQ[m, n - 1] &&
 NeQ[p, -1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 444

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[(a + b*x)^p*(c + d*x)^q, x], x, x^n], x
] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && EqQ[m - n +
 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{a+b\tan^{-1}(cx)}{x^4\left(d+ex^2\right)^{5/2}}\,dx = -\frac{a+b\tan^{-1}(cx)}{3dx^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^2x\left(d+ex^2\right)^{3/2}}+\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{16e^2x\left(a+b\tan^{-1}\right.}{3d^4\sqrt{d+ex^2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^2x\left(d+ex^2\right)^{3/2}}+\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{16e^2x\left(a+b\tan^{-1}\right.}{3d^4\sqrt{d+ex^2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^2x\left(d+ex^2\right)^{3/2}}+\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{16e^2x\left(a+b\tan^{-1}\right.}{3d^4\sqrt{d+ex^2}}$$

$$= -\frac{a+b\tan^{-1}(cx)}{3dx^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^2x\left(d+ex^2\right)^{3/2}}+\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+\frac{16e^2x\left(a+b\tan^{-1}\right.}{3d^4\sqrt{d+ex^2}}$$

$$= \frac{16be^2}{3cd^4\sqrt{d+ex^2}}-\frac{a+b\tan^{-1}(cx)}{3dx^3\left(d+ex^2\right)^{3/2}}+\frac{2e\left(a+b\tan^{-1}(cx)\right)}{d^2x\left(d+ex^2\right)^{3/2}}+\frac{8e^2x\left(a+b\tan^{-1}(cx)\right)}{3d^3\left(d+ex^2\right)^{3/2}}+16$$

$$= \frac{16be^2}{3cd^4\sqrt{d+ex^2}}-\frac{bc\left(c^2d+6e\right)}{3d^3\sqrt{d+ex^2}}+\frac{b\left(c^2d-2e\right)\left(c^4d^2+8c^2de-8e^2\right)}{3cd^4\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{bc}{3d^2x^2\sqrt{d+ex^2}}-$$

$$= \frac{16be^2}{3cd^4\sqrt{d+ex^2}}-\frac{bc\left(c^2d+6e\right)}{3d^3\sqrt{d+ex^2}}+\frac{b\left(c^2d-2e\right)\left(c^4d^2+8c^2de-8e^2\right)}{3cd^4\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{bc}{3d^2x^2\sqrt{d+ex^2}}-$$

$$= \frac{16be^2}{3cd^4\sqrt{d+ex^2}}-\frac{bc\left(c^2d+6e\right)}{3d^3\sqrt{d+ex^2}}+\frac{b\left(c^2d-2e\right)\left(c^4d^2+8c^2de-8e^2\right)}{3cd^4\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{bc}{3d^2x^2\sqrt{d+ex^2}}-$$

$$= \frac{16be^2}{3cd^4\sqrt{d+ex^2}}-\frac{bc\left(c^2d+6e\right)}{3d^3\sqrt{d+ex^2}}+\frac{b\left(c^2d-2e\right)\left(c^4d^2+8c^2de-8e^2\right)}{3cd^4\left(c^2d-e\right)\sqrt{d+ex^2}}+\frac{bc}{3d^2x^2\sqrt{d+ex^2}}-$$

Mathematica [C] time = 1.96, size = 510, normalized size = 1.21

$$-\frac{\frac{2a\left(d^3-6d^2ex^2-24de^2x^4-16e^3x^6\right)}{x^3\left(d+ex^2\right)^{3/2}}+\frac{bcd\left(c^2d\left(d+ex^2\right)+e\left(ex^2-d\right)\right)}{x^2\left(c^2d-e\right)\sqrt{d+ex^2}}-bc\sqrt{d}\left(2c^2d+15e\right)\log\left(\sqrt{d}\sqrt{d+ex^2}+d\right)+bc\sqrt{d}\log(x)\left(2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])/(x^4*(d + e*x^2)^(5/2)),x]
```

```
[Out] -1/6*((2*a*(d^3 - 6*d^2*e*x^2 - 24*d*e^2*x^4 - 16*e^3*x^6))/(x^3*(d + e*x^2
)^(3/2)) + (b*c*d*(e*(-d + e*x^2) + c^2*d*(d + e*x^2)))/((c^2*d - e)*x^2*Sq
```

```
rt[d + e*x^2]) + (2*b*(d^3 - 6*d^2*e*x^2 - 24*d*e^2*x^4 - 16*e^3*x^6)*ArcTa
n[c*x])/(x^3*(d + e*x^2)^(3/2)) + b*c*Sqrt[d]*(2*c^2*d + 15*e)*Log[x] - b*c
*Sqrt[d]*(2*c^2*d + 15*e)*Log[d + Sqrt[d]*Sqrt[d + e*x^2]] + (b*(c^6*d^3 +
6*c^4*d^2*e - 24*c^2*d*e^2 + 16*e^3)*Log[(12*c*d^4*Sqrt[c^2*d - e]*(c*d - I
*e*x + Sqrt[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^6*d^3 + 6*c^4*d^2*e - 24*c^2
*d*e^2 + 16*e^3)*(I + c*x))])/(c^2*d - e)^(3/2) + (b*(c^6*d^3 + 6*c^4*d^2*e
 - 24*c^2*d*e^2 + 16*e^3)*Log[(12*c*d^4*Sqrt[c^2*d - e]*(c*d + I*e*x + Sqrt
[c^2*d - e]*Sqrt[d + e*x^2]))/(b*(c^6*d^3 + 6*c^4*d^2*e - 24*c^2*d*e^2 + 16
*e^3)*(-I + c*x))])/(c^2*d - e)^(3/2))/d^4
```

fricas [B] time = 3.21, size = 3460, normalized size = 8.18

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] [-1/12*(((b*c^6*d^3*e^2 + 6*b*c^4*d^2*e^3 - 24*b*c^2*d*e^4 + 16*b*e^5)*x^7
+ 2*(b*c^6*d^4*e + 6*b*c^4*d^3*e^2 - 24*b*c^2*d^2*e^3 + 16*b*d*e^4)*x^5 + (
b*c^6*d^5 + 6*b*c^4*d^4*e - 24*b*c^2*d^3*e^2 + 16*b*d^2*e^3)*x^3)*sqrt(c^2*
d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e + 2*(4*c^4*d*e - 3*c^2*e^2)
*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d - e)*sqrt(e*x^2 + d) + e^2)
/(c^4*x^4 + 2*c^2*x^2 + 1)) - ((2*b*c^7*d^3*e^2 + 11*b*c^5*d^2*e^3 - 28*b*c
^3*d*e^4 + 15*b*c*e^5)*x^7 + 2*(2*b*c^7*d^4*e + 11*b*c^5*d^3*e^2 - 28*b*c^3
*d^2*e^3 + 15*b*c*d*e^4)*x^5 + (2*b*c^7*d^5 + 11*b*c^5*d^4*e - 28*b*c^3*d^3
*e^2 + 15*b*c*d^2*e^3)*x^3)*sqrt(d)*log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d)
 + 2*d)/x^2) + 2*(2*a*c^4*d^5 - 4*a*c^2*d^4*e - 32*(a*c^4*d^2*e^3 - 2*a*c^2
*d*e^4 + a*e^5)*x^6 + 2*a*d^3*e^2 + (b*c^5*d^3*e^2 - b*c*d*e^4)*x^5 - 48*(a
*c^4*d^3*e^2 - 2*a*c^2*d^2*e^3 + a*d*e^4)*x^4 + 2*(b*c^5*d^4*e - b*c^3*d^3*
e^2)*x^3 - 12*(a*c^4*d^4*e - 2*a*c^2*d^3*e^2 + a*d^2*e^3)*x^2 + (b*c^5*d^5
- 2*b*c^3*d^4*e + b*c*d^3*e^2)*x + 2*(b*c^4*d^5 - 2*b*c^2*d^4*e - 16*(b*c^4
*d^2*e^3 - 2*b*c^2*d*e^4 + b*e^5)*x^6 + b*d^3*e^2 - 24*(b*c^4*d^3*e^2 - 2*b
*c^2*d^2*e^3 + b*d*e^4)*x^4 - 6*(b*c^4*d^4*e - 2*b*c^2*d^3*e^2 + b*d^2*e^3)
*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/((c^4*d^6*e^2 - 2*c^2*d^5*e^3 + d^4*e^4
)*x^7 + 2*(c^4*d^7*e - 2*c^2*d^6*e^2 + d^5*e^3)*x^5 + (c^4*d^8 - 2*c^2*d^7*
e + d^6*e^2)*x^3), -1/12*(2*((b*c^6*d^3*e^2 + 6*b*c^4*d^2*e^3 - 24*b*c^2*d*
e^4 + 16*b*e^5)*x^7 + 2*(b*c^6*d^4*e + 6*b*c^4*d^3*e^2 - 24*b*c^2*d^2*e^3 +
 16*b*d*e^4)*x^5 + (b*c^6*d^5 + 6*b*c^4*d^4*e - 24*b*c^2*d^3*e^2 + 16*b*d^2
*e^3)*x^3)*sqrt(-c^2*d + e)*arctan(-1/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2
*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*d*e + (c^3*d*e - c*e^2)*x^2)) - ((2*b*
c^7*d^3*e^2 + 11*b*c^5*d^2*e^3 - 28*b*c^3*d*e^4 + 15*b*c*e^5)*x^7 + 2*(2*b*
c^7*d^4*e + 11*b*c^5*d^3*e^2 - 28*b*c^3*d^2*e^3 + 15*b*c*d*e^4)*x^5 + (2*b*
c^7*d^5 + 11*b*c^5*d^4*e - 28*b*c^3*d^3*e^2 + 15*b*c*d^2*e^3)*x^3)*sqrt(d)*
log(-(e*x^2 + 2*sqrt(e*x^2 + d)*sqrt(d) + 2*d)/x^2) + 2*(2*a*c^4*d^5 - 4*a*
c^2*d^4*e - 32*(a*c^4*d^2*e^3 - 2*a*c^2*d*e^4 + a*e^5)*x^6 + 2*a*d^3*e^2 +
(b*c^5*d^3*e^2 - b*c*d*e^4)*x^5 - 48*(a*c^4*d^3*e^2 - 2*a*c^2*d^2*e^3 + a*d
*e^4)*x^4 + 2*(b*c^5*d^4*e - b*c^3*d^3*e^2)*x^3 - 12*(a*c^4*d^4*e - 2*a*c^2
*d^3*e^2 + a*d^2*e^3)*x^2 + (b*c^5*d^5 - 2*b*c^3*d^4*e + b*c*d^3*e^2)*x + 2
*(b*c^4*d^5 - 2*b*c^2*d^4*e - 16*(b*c^4*d^2*e^3 - 2*b*c^2*d*e^4 + b*e^5)*x^
6 + b*d^3*e^2 - 24*(b*c^4*d^3*e^2 - 2*b*c^2*d^2*e^3 + b*d*e^4)*x^4 - 6*(b*c
^4*d^4*e - 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x^2)*arctan(c*x))*sqrt(e*x^2 + d))/
((c^4*d^6*e^2 - 2*c^2*d^5*e^3 + d^4*e^4)*x^7 + 2*(c^4*d^7*e - 2*c^2*d^6*e^2
 + d^5*e^3)*x^5 + (c^4*d^8 - 2*c^2*d^7*e + d^6*e^2)*x^3), -1/12*(2*((2*b*c^
7*d^3*e^2 + 11*b*c^5*d^2*e^3 - 28*b*c^3*d*e^4 + 15*b*c*e^5)*x^7 + 2*(2*b*c^
7*d^4*e + 11*b*c^5*d^3*e^2 - 28*b*c^3*d^2*e^3 + 15*b*c*d*e^4)*x^5 + (2*b*c^
7*d^5 + 11*b*c^5*d^4*e - 28*b*c^3*d^3*e^2 + 15*b*c*d^2*e^3)*x^3)*sqrt(-d)*a
rctan(sqrt(-d)/sqrt(e*x^2 + d)) + ((b*c^6*d^3*e^2 + 6*b*c^4*d^2*e^3 - 24*b*
c^2*d*e^4 + 16*b*e^5)*x^7 + 2*(b*c^6*d^4*e + 6*b*c^4*d^3*e^2 - 24*b*c^2*d^2
*e^3 + 16*b*d*e^4)*x^5 + (b*c^6*d^5 + 6*b*c^4*d^4*e - 24*b*c^2*d^3*e^2 + 16
*b*d^2*e^3)*x^3)*sqrt(c^2*d - e)*log((c^4*e^2*x^4 + 8*c^4*d^2 - 8*c^2*d*e +
```

```
2*(4*c^4*d*e - 3*c^2*e^2)*x^2 + 4*(c^3*e*x^2 + 2*c^3*d - c*e)*sqrt(c^2*d -
e)*sqrt(e*x^2 + d) + e^2)/(c^4*x^4 + 2*c^2*x^2 + 1)) + 2*(2*a*c^4*d^5 - 4*
a*c^2*d^4*e - 32*(a*c^4*d^2*e^3 - 2*a*c^2*d*e^4 + a*e^5)*x^6 + 2*a*d^3*e^2
+ (b*c^5*d^3*e^2 - b*c*d*e^4)*x^5 - 48*(a*c^4*d^3*e^2 - 2*a*c^2*d^2*e^3 + a
*d*e^4)*x^4 + 2*(b*c^5*d^4*e - b*c^3*d^3*e^2)*x^3 - 12*(a*c^4*d^4*e - 2*a*c
^2*d^3*e^2 + a*d^2*e^3)*x^2 + (b*c^5*d^5 - 2*b*c^3*d^4*e + b*c*d^3*e^2)*x +
2*(b*c^4*d^5 - 2*b*c^2*d^4*e - 16*(b*c^4*d^2*e^3 - 2*b*c^2*d*e^4 + b*e^5)*
x^6 + b*d^3*e^2 - 24*(b*c^4*d^3*e^2 - 2*b*c^2*d^2*e^3 + b*d*e^4)*x^4 - 6*(b
*c^4*d^4*e - 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x^2)*arctan(c*x))*sqrt(e*x^2 + d)
)/((c^4*d^6*e^2 - 2*c^2*d^5*e^3 + d^4*e^4)*x^7 + 2*(c^4*d^7*e - 2*c^2*d^6*e
^2 + d^5*e^3)*x^5 + (c^4*d^8 - 2*c^2*d^7*e + d^6*e^2)*x^3), -1/6*(((b*c^6*d
^3*e^2 + 6*b*c^4*d^2*e^3 - 24*b*c^2*d*e^4 + 16*b*e^5)*x^7 + 2*(b*c^6*d^4*e
+ 6*b*c^4*d^3*e^2 - 24*b*c^2*d^2*e^3 + 16*b*d*e^4)*x^5 + (b*c^6*d^5 + 6*b*c
^4*d^4*e - 24*b*c^2*d^3*e^2 + 16*b*d^2*e^3)*x^3)*sqrt(-c^2*d + e)*arctan(-1
/2*(c^2*e*x^2 + 2*c^2*d - e)*sqrt(-c^2*d + e)*sqrt(e*x^2 + d)/(c^3*d^2 - c*
d*e + (c^3*d*e - c*e^2)*x^2)) + ((2*b*c^7*d^3*e^2 + 11*b*c^5*d^2*e^3 - 28*b
*c^3*d*e^4 + 15*b*c*e^5)*x^7 + 2*(2*b*c^7*d^4*e + 11*b*c^5*d^3*e^2 - 28*b*c
^3*d^2*e^3 + 15*b*c*d*e^4)*x^5 + (2*b*c^7*d^5 + 11*b*c^5*d^4*e - 28*b*c^3*d
^3*e^2 + 15*b*c*d^2*e^3)*x^3)*sqrt(-d)*arctan(sqrt(-d)/sqrt(e*x^2 + d)) + (
2*a*c^4*d^5 - 4*a*c^2*d^4*e - 32*(a*c^4*d^2*e^3 - 2*a*c^2*d*e^4 + a*e^5)*x^
6 + 2*a*d^3*e^2 + (b*c^5*d^3*e^2 - b*c*d*e^4)*x^5 - 48*(a*c^4*d^3*e^2 - 2*a
*c^2*d^2*e^3 + a*d*e^4)*x^4 + 2*(b*c^5*d^4*e - b*c^3*d^3*e^2)*x^3 - 12*(a*c
^4*d^4*e - 2*a*c^2*d^3*e^2 + a*d^2*e^3)*x^2 + (b*c^5*d^5 - 2*b*c^3*d^4*e +
b*c*d^3*e^2)*x + 2*(b*c^4*d^5 - 2*b*c^2*d^4*e - 16*(b*c^4*d^2*e^3 - 2*b*c^2
*d*e^4 + b*e^5)*x^6 + b*d^3*e^2 - 24*(b*c^4*d^3*e^2 - 2*b*c^2*d^2*e^3 + b*d
*e^4)*x^4 - 6*(b*c^4*d^4*e - 2*b*c^2*d^3*e^2 + b*d^2*e^3)*x^2)*arctan(c*x))
*sqrt(e*x^2 + d))/((c^4*d^6*e^2 - 2*c^2*d^5*e^3 + d^4*e^4)*x^7 + 2*(c^4*d^7
*e - 2*c^2*d^6*e^2 + d^5*e^3)*x^5 + (c^4*d^8 - 2*c^2*d^7*e + d^6*e^2)*x^3)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(5/2),x, algorithm="giac")
[Out] sage0*x
```

maple [F] time = 1.06, size = 0, normalized size = 0.00

$$\int \frac{a+b\arctan(cx)}{x^4\left(e\,x^2+d\right)^{\frac{5}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))/x^4/(e*x^2+d)^(5/2),x)
[Out] int((a+b*arctan(c*x))/x^4/(e*x^2+d)^(5/2),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}a\left(\frac{16\,e^2x}{\sqrt{ex^2+d}\,d^4}+\frac{8\,e^2x}{\left(ex^2+d\right)^{\frac{3}{2}}d^3}+\frac{6\,e}{\left(ex^2+d\right)^{\frac{3}{2}}d^2x}-\frac{1}{\left(ex^2+d\right)^{\frac{3}{2}}dx^3}\right)+2\,b\int\frac{\arctan(cx)}{2\left(e^2x^8+2\,dex^6+d^2x^4\right)\sqrt{ex^2+d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))/x^4/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] 1/3*a*(16*e^2*x/(sqrt(e*x^2 + d)*d^4) + 8*e^2*x/((e*x^2 + d)^(3/2)*d^3) + 6
*e/((e*x^2 + d)^(3/2)*d^2*x) - 1/((e*x^2 + d)^(3/2)*d*x^3)) + 2*b*integrate
(1/2*arctan(c*x)/((e^2*x^8 + 2*d*e*x^6 + d^2*x^4)*sqrt(e*x^2 + d)), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{a+b\,\mathrm{atan}\left(c\,x\right)}{x^4\,{\left(e\,x^2+d\right)}^{5/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))/(x^4*(d + e*x^2)^(5/2)),x)
```

```
[Out] int((a + b*atan(c*x))/(x^4*(d + e*x^2)^(5/2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))/x**4/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.1226 $\int \frac{\tan^{-1}(ax)}{\left(c+dx^2\right)^{7/2}}\,dx$

Optimal. Leaf size=208

$$-\frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}}-\frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}}+\frac{\left(15a^4c^2-20a^2cd+8d^2\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{15c^3\left(a^2c-d\right)^{5/2}}+\frac{8x\tan^{-1}(ax}{15c^3\sqrt{c+dx}}$$

```
[Out] -1/15*a/c/(a^2*c-d)/(d*x^2+c)^(3/2)+1/5*x*arctan(a*x)/c/(d*x^2+c)^(5/2)+4/1
5*x*arctan(a*x)/c^2/(d*x^2+c)^(3/2)+1/15*(15*a^4*c^2-20*a^2*c*d+8*d^2)*arct
anh(a*(d*x^2+c)^(1/2)/(a^2*c-d)^(1/2))/c^3/(a^2*c-d)^(5/2)-1/15*a*(7*a^2*c-
4*d)/c^2/(a^2*c-d)^2/(d*x^2+c)^(1/2)+8/15*x*arctan(a*x)/c^3/(d*x^2+c)^(1/2)
```

Rubi [A] time = 1.00, antiderivative size = 208, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {192, 191, 4912, 6688, 12, 6715, 897, 1261, 208}

$$\frac{\left(15a^4c^2-20a^2cd+8d^2\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{15c^3\left(a^2c-d\right)^{5/2}}-\frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}}-\frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}}+\frac{8x\tan^{-1}(ax)}{15c^3\sqrt{c+dx^2}}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(c + d*x^2)^(7/2),x]
```

```
[Out] -a/(15*c*(a^2*c - d)*(c + d*x^2)^(3/2)) - (a*(7*a^2*c - 4*d))/(15*c^2*(a^2*
c - d)^2*Sqrt[c + d*x^2]) + (x*ArcTan[a*x])/(5*c*(c + d*x^2)^(5/2)) + (4*x*
ArcTan[a*x])/(15*c^2*(c + d*x^2)^(3/2)) + (8*x*ArcTan[a*x])/(15*c^3*Sqrt[c
+ d*x^2]) + ((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*ArcTanh[(a*Sqrt[c + d*x^2])/
Sqrt[a^2*c - d]])/(15*c^3*(a^2*c - d)^(5/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
 && NeQ[p, -1]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 897

```
Int[((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_))^(n_)*((a_.) + (b_.)*(x_)
 + (c_.)*(x_)^2)^(p_.), x_Symbol] :> With[{q = Denominator[m]}, Dist[q/e, S
ubst[Int[x^(q*(m + 1) - 1)*((e*f - d*g)/e + (g*x^q)/e)^n*((c*d^2 - b*d*e +
```

```
a*e^2)/e^2 - ((2*c*d - b*e)*x^q)/e^2 + (c*x^(2*q))/e^2)^p, x], x, (d + e*x)
^(1/q)], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && NeQ
[b^2 - 4*a*c, 0] && NeQ[c*d^2 - b*d*e + a*e^2, 0] && IntegersQ[n, p] && Fra
ctionQ[m]
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{\left(c+dx^2\right)^{7/2}}\,dx = \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}} + \frac{8x\tan^{-1}(ax)}{15c^3\sqrt{c+dx^2}} - a\int \frac{\frac{x}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x}{15c^2\left(c+dx^2\right)^{3/2}} + \frac{8}{15c^3\sqrt{}}}{1+a^2x^2}$$

$$= \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}} + \frac{8x\tan^{-1}(ax)}{15c^3\sqrt{c+dx^2}} - a\int \frac{x\left(15c^2+20cdx^2+8d^2x^4\right)}{15c^3\left(1+a^2x^2\right)\left(c+dx^2\right)^{5/2}}dx$$

$$= \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}} + \frac{8x\tan^{-1}(ax)}{15c^3\sqrt{c+dx^2}} - \frac{a\int \frac{x\left(15c^2+20cdx^2+8d^2x^4\right)}{\left(1+a^2x^2\right)\left(c+dx^2\right)^{5/2}}dx}{15c^3}$$

$$= \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}} + \frac{8x\tan^{-1}(ax)}{15c^3\sqrt{c+dx^2}} - \frac{a\,\text{Subst}\left(\int \frac{15c^2+20cdx+8d^2x^2}{\left(1+a^2x\right)(c+dx)^{5/2}}dx, x, x^2\right)}{30c^3}$$

$$= \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}} + \frac{8x\tan^{-1}(ax)}{15c^3\sqrt{c+dx^2}} - \frac{a\,\text{Subst}\left(\int \frac{3c^2+4cx^2+8x^4}{x^4\left(\frac{-a^2c+d}{d}+\frac{a^2x^2}{d}\right)}dx, x, \sqrt{c+}\right.}{15c^3d}$$

$$= \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}} + \frac{8x\tan^{-1}(ax)}{15c^3\sqrt{c+dx^2}} - \frac{a\,\text{Subst}\left(\int\left(\frac{3c^2d}{\left(-a^2c+d\right)x^4} - \frac{c\left(7a^2c-4d\right)d}{\left(-a^2c+d\right)^2x^2} + \right.\right.}{15}$$

$$= -\frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}} - \frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}} + \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}$$

$$= -\frac{a}{15c\left(a^2c-d\right)\left(c+dx^2\right)^{3/2}} - \frac{a\left(7a^2c-4d\right)}{15c^2\left(a^2c-d\right)^2\sqrt{c+dx^2}} + \frac{x\tan^{-1}(ax)}{5c\left(c+dx^2\right)^{5/2}} + \frac{4x\tan^{-1}(ax)}{15c^2\left(c+dx^2\right)^{3/2}}$$

Mathematica [C] time = 0.96, size = 345, normalized size = 1.66

$$\frac{-\frac{2ac\left(a^2c\left(8c+7dx^2\right)-d\left(5c+4dx^2\right)\right)}{\left(d-a^2c\right)^2\left(c+dx^2\right)^{3/2}} + \frac{\left(15a^4c^2-20a^2cd+8d^2\right)\log\left(-\frac{60ac^3\left(a^2c-d\right)^{3/2}\left(\sqrt{a^2c-d}\sqrt{c+dx^2}+ac-idx\right)}{(ax+i)\left(15a^4c^2-20a^2cd+8d^2\right)}\right)}{\left(a^2c-d\right)^{5/2}} + \frac{\left(15a^4c^2-20a^2cd+8d^2\right)\log\left(-\frac{60ac^3\left(a^2c-d\right.}{(ax-}\right.}{\left(a^2c-d\right)^{5/2}}}{30c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(c + d*x^2)^(7/2),x]
```

```
[Out] ((-2*a*c*(-(d*(5*c + 4*d*x^2)) + a^2*c*(8*c + 7*d*x^2)))/((-(a^2*c) + d)^2*
(c + d*x^2)^(3/2)) + (2*x*(15*c^2 + 20*c*d*x^2 + 8*d^2*x^4)*ArcTan[a*x])/(c
 + d*x^2)^(5/2) + ((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*Log[(-60*a*c^3*(a^2*c
- d)^(3/2)*(a*c - I*d*x + Sqrt[a^2*c - d]*Sqrt[c + d*x^2]))/((15*a^4*c^2 -
20*a^2*c*d + 8*d^2)*(I + a*x))])/(a^2*c - d)^(5/2) + ((15*a^4*c^2 - 20*a^2*
c*d + 8*d^2)*Log[(-60*a*c^3*(a^2*c - d)^(3/2)*(a*c + I*d*x + Sqrt[a^2*c - d
]*Sqrt[c + d*x^2]))/((15*a^4*c^2 - 20*a^2*c*d + 8*d^2)*(-I + a*x))])/(a^2*c
 - d)^(5/2))/(30*c^3)
```

fricas [B] time = 0.57, size = 1280, normalized size = 6.15

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(d*x^2+c)^(7/2),x, algorithm="fricas")
```

```
[Out] [1/60*((15*a^4*c^5 - 20*a^2*c^4*d + (15*a^4*c^2*d^3 - 20*a^2*c*d^4 + 8*d^5)
*x^6 + 8*c^3*d^2 + 3*(15*a^4*c^3*d^2 - 20*a^2*c^2*d^3 + 8*c*d^4)*x^4 + 3*(1
5*a^4*c^4*d - 20*a^2*c^3*d^2 + 8*c^2*d^3)*x^2)*sqrt(a^2*c - d)*log((a^4*d^2
*x^4 + 8*a^4*c^2 - 8*a^2*c*d + 2*(4*a^4*c*d - 3*a^2*d^2)*x^2 + 4*(a^3*d*x^2
 + 2*a^3*c - a*d)*sqrt(a^2*c - d)*sqrt(d*x^2 + c) + d^2)/(a^4*x^4 + 2*a^2*x
^2 + 1)) - 4*(8*a^5*c^5 - 13*a^3*c^4*d + 5*a*c^3*d^2 + (7*a^5*c^3*d^2 - 11*
a^3*c^2*d^3 + 4*a*c*d^4)*x^4 + 3*(5*a^5*c^4*d - 8*a^3*c^3*d^2 + 3*a*c^2*d^3
)*x^2 - (8*(a^6*c^3*d^2 - 3*a^4*c^2*d^3 + 3*a^2*c*d^4 - d^5)*x^5 + 20*(a^6*
c^4*d - 3*a^4*c^3*d^2 + 3*a^2*c^2*d^3 - c*d^4)*x^3 + 15*(a^6*c^5 - 3*a^4*c^
4*d + 3*a^2*c^3*d^2 - c^2*d^3)*x)*arctan(a*x))*sqrt(d*x^2 + c))/(a^6*c^9 -
3*a^4*c^8*d + 3*a^2*c^7*d^2 - c^6*d^3 + (a^6*c^6*d^3 - 3*a^4*c^5*d^4 + 3*a^
2*c^4*d^5 - c^3*d^6)*x^6 + 3*(a^6*c^7*d^2 - 3*a^4*c^6*d^3 + 3*a^2*c^5*d^4 -
 c^4*d^5)*x^4 + 3*(a^6*c^8*d - 3*a^4*c^7*d^2 + 3*a^2*c^6*d^3 - c^5*d^4)*x^2
), 1/30*((15*a^4*c^5 - 20*a^2*c^4*d + (15*a^4*c^2*d^3 - 20*a^2*c*d^4 + 8*d^
5)*x^6 + 8*c^3*d^2 + 3*(15*a^4*c^3*d^2 - 20*a^2*c^2*d^3 + 8*c*d^4)*x^4 + 3*
(15*a^4*c^4*d - 20*a^2*c^3*d^2 + 8*c^2*d^3)*x^2)*sqrt(-a^2*c + d)*arctan(-1
/2*(a^2*d*x^2 + 2*a^2*c - d)*sqrt(-a^2*c + d)*sqrt(d*x^2 + c)/(a^3*c^2 - a*
c*d + (a^3*c*d - a*d^2)*x^2)) - 2*(8*a^5*c^5 - 13*a^3*c^4*d + 5*a*c^3*d^2 +
 (7*a^5*c^3*d^2 - 11*a^3*c^2*d^3 + 4*a*c*d^4)*x^4 + 3*(5*a^5*c^4*d - 8*a^3*
c^3*d^2 + 3*a*c^2*d^3)*x^2 - (8*(a^6*c^3*d^2 - 3*a^4*c^2*d^3 + 3*a^2*c*d^4
- d^5)*x^5 + 20*(a^6*c^4*d - 3*a^4*c^3*d^2 + 3*a^2*c^2*d^3 - c*d^4)*x^3 + 1
5*(a^6*c^5 - 3*a^4*c^4*d + 3*a^2*c^3*d^2 - c^2*d^3)*x)*arctan(a*x))*sqrt(d*
x^2 + c))/(a^6*c^9 - 3*a^4*c^8*d + 3*a^2*c^7*d^2 - c^6*d^3 + (a^6*c^6*d^3 -
 3*a^4*c^5*d^4 + 3*a^2*c^4*d^5 - c^3*d^6)*x^6 + 3*(a^6*c^7*d^2 - 3*a^4*c^6*
d^3 + 3*a^2*c^5*d^4 - c^4*d^5)*x^4 + 3*(a^6*c^8*d - 3*a^4*c^7*d^2 + 3*a^2*c
^6*d^3 - c^5*d^4)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(d*x^2+c)^(7/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.28, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{(dx^2+c)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(d*x^2+c)^(7/2),x)
```

```
[Out] int(arctan(a*x)/(d*x^2+c)^(7/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(d*x^2+c)^(7/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
```

```
elp (example of legal syntax is 'assume(d-a^2*c>0)', see `assume?` for more
 details)Is d-a^2*c positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\operatorname{atan}(a\,x)}{\left(d\,x^2+c\right)^{7/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + d*x^2)^(7/2),x)
```

```
[Out] int(atan(a*x)/(c + d*x^2)^(7/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}(ax)}{\left(c+dx^2\right)^{\frac{7}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(d*x**2+c)**(7/2),x)
```

```
[Out] Integral(atan(a*x)/(c + d*x**2)**(7/2), x)
```

3.1227 $\int \frac{\tan^{-1}(ax)}{\left(c+dx^2\right)^{9/2}}\,dx$

Optimal. Leaf size=293

$$-\frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}}-\frac{a}{35c\left(a^2c-d\right)\left(c+dx^2\right)^{5/2}}-\frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}}+\frac{\left(35a^6c^3-70a^4c^2d+5\right.}{35c}$$

```
[Out] -1/35*a/c/(a^2*c-d)/(d*x^2+c)^(5/2)-1/105*a*(11*a^2*c-6*d)/c^2/(a^2*c-d)^2/
(d*x^2+c)^(3/2)+1/7*x*arctan(a*x)/c/(d*x^2+c)^(7/2)+6/35*x*arctan(a*x)/c^2/
(d*x^2+c)^(5/2)+8/35*x*arctan(a*x)/c^3/(d*x^2+c)^(3/2)+1/35*(35*a^6*c^3-70*
a^4*c^2*d+56*a^2*c*d^2-16*d^3)*arctanh(a*(d*x^2+c)^(1/2)/(a^2*c-d)^(1/2))/c
^4/(a^2*c-d)^(7/2)-1/35*a*(19*a^4*c^2-22*a^2*c*d+8*d^2)/c^3/(a^2*c-d)^3/(d*
x^2+c)^(1/2)+16/35*x*arctan(a*x)/c^4/(d*x^2+c)^(1/2)
```

Rubi [A] time = 1.23, antiderivative size = 293, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 16, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.562, Rules used = {192, 191, 4912, 6688, 12, 6715, 1619, 63, 208}

$$-\frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}}+\frac{\left(-70a^4c^2d+35a^6c^3+56a^2cd^2-16d^3\right)\tanh^{-1}\left(\frac{a\sqrt{c+dx^2}}{\sqrt{a^2c-d}}\right)}{35c^4\left(a^2c-d\right)^{7/2}}-\frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+\right.}$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[a*x]/(c + d*x^2)^(9/2),x]
```

```
[Out] -a/(35*c*(a^2*c - d)*(c + d*x^2)^(5/2)) - (a*(11*a^2*c - 6*d))/(105*c^2*(a^
2*c - d)^2*(c + d*x^2)^(3/2)) - (a*(19*a^4*c^2 - 22*a^2*c*d + 8*d^2))/(35*c
^3*(a^2*c - d)^3*Sqrt[c + d*x^2]) + (x*ArcTan[a*x])/(7*c*(c + d*x^2)^(7/2))
 + (6*x*ArcTan[a*x])/(35*c^2*(c + d*x^2)^(5/2)) + (8*x*ArcTan[a*x])/(35*c^3
*(c + d*x^2)^(3/2)) + (16*x*ArcTan[a*x])/(35*c^4*Sqrt[c + d*x^2]) + ((35*a^
6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*ArcTanh[(a*Sqrt[c + d*x^2])/S
qrt[a^2*c - d]])/(35*c^4*(a^2*c - d)^(7/2))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 63

```
Int[((a_.) + (b_.)*(x_))^(m_)*((c_.) + (d_.)*(x_))^(n_), x_Symbol] :> With[
{p = Denominator[m]}, Dist[p/b, Subst[Int[x^(p*(m + 1) - 1)*(c - (a*d)/b +
(d*x^p)/b)^n, x], x, (a + b*x)^(1/p)], x]] /; FreeQ[{a, b, c, d}, x] && NeQ
[b*c - a*d, 0] && LtQ[-1, m, 0] && LeQ[-1, n, 0] && LeQ[Denominator[n], Den
ominator[m]] && IntLinearQ[a, b, c, d, m, n, x]
```

Rule 191

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x*(a + b*x^n)^(p + 1)
)/a, x] /; FreeQ[{a, b, n, p}, x] && EqQ[1/n + p + 1, 0]
```

Rule 192

```
Int[((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> -Simp[(x*(a + b*x^n)^(p + 1
))/(a*n*(p + 1)), x] + Dist[(n*(p + 1) + 1)/(a*n*(p + 1)), Int[(a + b*x^n)^
(p + 1), x], x] /; FreeQ[{a, b, n, p}, x] && ILtQ[Simplify[1/n + p + 1], 0]
```

```
&& NeQ[p, -1]
```

Rule 208

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[-(a/b), 2]*ArcTanh[x/
Rt[-(a/b), 2]])/a, x] /; FreeQ[{a, b}, x] && NegQ[a/b]
```

Rule 1619

```
Int[((Px_)*((c_.) + (d_.)*(x_))^(n_.))/((a_.) + (b_.)*(x_)), x_Symbol] :> I
nt[ExpandIntegrand[1/Sqrt[c + d*x], (Px*(c + d*x)^(n + 1/2))/(a + b*x), x],
 x] /; FreeQ[{a, b, c, d, n}, x] && PolyQ[Px, x] && ILtQ[n + 1/2, 0] && GtQ
[Expon[Px, x], 2]
```

Rule 4912

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + (e_.)*(x_)^2)^(q_.), x_Symb
ol] :> With[{u = IntHide[(d + e*x^2)^q, x]}, Dist[a + b*ArcTan[c*x], u, x]
- Dist[b*c, Int[u/(1 + c^2*x^2), x], x]] /; FreeQ[{a, b, c, d, e}, x] && (I
ntegerQ[q] || ILtQ[q + 1/2, 0])
```

Rule 6688

```
Int[u_, x_Symbol] :> With[{v = SimplifyIntegrand[u, x]}, Int[v, x] /; Simpl
erIntegrandQ[v, u, x]]
```

Rule 6715

```
Int[(u_)*(x_)^(m_.), x_Symbol] :> Dist[1/(m + 1), Subst[Int[SubstFor[x^(m +
 1), u, x], x], x, x^(m + 1)], x] /; FreeQ[m, x] && NeQ[m, -1] && FunctionO
fQ[x^(m + 1), u, x]
```

Rubi steps

$$\int \frac{\tan^{-1}(ax)}{\left(c+dx^2\right)^{9/2}}dx = \frac{x\tan^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\tan^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\tan^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\tan^{-1}(ax)}{35c^4\sqrt{c+dx^2}} - a\int \frac{\frac{x}{7c\left(c+dx^2\right)^{7/}}}{}$$

$$= \frac{x\tan^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\tan^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\tan^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\tan^{-1}(ax)}{35c^4\sqrt{c+dx^2}} - a\int \frac{x\left(35c^3+\right.}{35c}$$

$$= \frac{x\tan^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\tan^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\tan^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\tan^{-1}(ax)}{35c^4\sqrt{c+dx^2}} - \frac{a\int \frac{x\left(35c^3+70c^2\right.}{\left(1+a\right.}}{}$$

$$= \frac{x\tan^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\tan^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\tan^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\tan^{-1}(ax)}{35c^4\sqrt{c+dx^2}} - \frac{a\,\mathrm{Subst}\left(\int 35\right.}{}$$

$$= \frac{x\tan^{-1}(ax)}{7c\left(c+dx^2\right)^{7/2}} + \frac{6x\tan^{-1}(ax)}{35c^2\left(c+dx^2\right)^{5/2}} + \frac{8x\tan^{-1}(ax)}{35c^3\left(c+dx^2\right)^{3/2}} + \frac{16x\tan^{-1}(ax)}{35c^4\sqrt{c+dx^2}} - \frac{a\,\mathrm{Subst}\left(\int\left(-\right.\right.}{}$$

$$= -\frac{a}{35c\left(a^2c-d\right)\left(c+dx^2\right)^{5/2}} - \frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}} - \frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}}$$

$$= -\frac{a}{35c\left(a^2c-d\right)\left(c+dx^2\right)^{5/2}} - \frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}} - \frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}}$$

$$= -\frac{a}{35c\left(a^2c-d\right)\left(c+dx^2\right)^{5/2}} - \frac{a\left(11a^2c-6d\right)}{105c^2\left(a^2c-d\right)^2\left(c+dx^2\right)^{3/2}} - \frac{a\left(19a^4c^2-22a^2cd+8d^2\right)}{35c^3\left(a^2c-d\right)^3\sqrt{c+dx^2}}$$

Mathematica [C] time = 1.54, size = 450, normalized size = 1.54

$$\frac{-\frac{2ac\left(3c^2\left(d-a^2c\right)^2+c\left(11a^2c-6d\right)\left(a^2c-d\right)\left(c+dx^2\right)+3\left(19a^4c^2-22a^2cd+8d^2\right)\left(c+dx^2\right)^2\right)}{\left(a^2c-d\right)^3\left(c+dx^2\right)^{5/2}} + \frac{3\left(35a^6c^3-70a^4c^2d+56a^2cd^2-16d^3\right)\log\left(-\frac{140ac^4\left(a^2c-d\right)^{5/2}\left(\right.}{(ax+i)\left(35a^6c^3-\right.}\right.}{\left(a^2c-d\right)^{7/2}}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[a*x]/(c + d*x^2)^(9/2),x]
```

```
[Out] ((-2*a*c*(3*c^2*(-(a^2*c) + d)^2 + c*(11*a^2*c - 6*d)*(a^2*c - d)*(c + d*x^
2) + 3*(19*a^4*c^2 - 22*a^2*c*d + 8*d^2)*(c + d*x^2)^2))/((a^2*c - d)^3*(c
+ d*x^2)^(5/2)) + (6*x*(35*c^3 + 70*c^2*d*x^2 + 56*c*d^2*x^4 + 16*d^3*x^6)*
ArcTan[a*x])/(c + d*x^2)^(7/2) + (3*(35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d
^2 - 16*d^3)*Log[(-140*a*c^4*(a^2*c - d)^(5/2)*(a*c - I*d*x + Sqrt[a^2*c -
d]*Sqrt[c + d*x^2]))/((35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*(
I + a*x))])/(a^2*c - d)^(7/2) + (3*(35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^
2 - 16*d^3)*Log[(-140*a*c^4*(a^2*c - d)^(5/2)*(a*c + I*d*x + Sqrt[a^2*c - d
]*Sqrt[c + d*x^2]))/((35*a^6*c^3 - 70*a^4*c^2*d + 56*a^2*c*d^2 - 16*d^3)*(-
I + a*x))])/(a^2*c - d)^(7/2))/(210*c^4)
```

fricas [B] time = 1.24, size = 1986, normalized size = 6.78

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(d*x^2+c)^(9/2),x, algorithm="fricas")
```

```
[Out] [1/420*(3*(35*a^6*c^7 - 70*a^4*c^6*d + 56*a^2*c^5*d^2 + (35*a^6*c^3*d^4 - 7
0*a^4*c^2*d^5 + 56*a^2*c*d^6 - 16*d^7)*x^8 - 16*c^4*d^3 + 4*(35*a^6*c^4*d^3
 - 70*a^4*c^3*d^4 + 56*a^2*c^2*d^5 - 16*c*d^6)*x^6 + 6*(35*a^6*c^5*d^2 - 70
*a^4*c^4*d^3 + 56*a^2*c^3*d^4 - 16*c^2*d^5)*x^4 + 4*(35*a^6*c^6*d - 70*a^4*
c^5*d^2 + 56*a^2*c^4*d^3 - 16*c^3*d^4)*x^2)*sqrt(a^2*c - d)*log((a^4*d^2*x^
4 + 8*a^4*c^2 - 8*a^2*c*d + 2*(4*a^4*c*d - 3*a^2*d^2)*x^2 + 4*(a^3*d*x^2 +
2*a^3*c - a*d)*sqrt(a^2*c - d)*sqrt(d*x^2 + c) + d^2)/(a^4*x^4 + 2*a^2*x^2
+ 1)) - 4*(71*a^7*c^7 - 160*a^5*c^6*d + 122*a^3*c^5*d^2 - 33*a*c^4*d^3 + 3*
(19*a^7*c^4*d^3 - 41*a^5*c^3*d^4 + 30*a^3*c^2*d^5 - 8*a*c*d^6)*x^6 + (182*a
^7*c^5*d^2 - 397*a^5*c^4*d^3 + 293*a^3*c^3*d^4 - 78*a*c^2*d^5)*x^4 + (196*a
^7*c^6*d - 434*a^5*c^5*d^2 + 325*a^3*c^4*d^3 - 87*a*c^3*d^4)*x^2 - 3*(16*(a
^8*c^4*d^3 - 4*a^6*c^3*d^4 + 6*a^4*c^2*d^5 - 4*a^2*c*d^6 + d^7)*x^7 + 56*(a
^8*c^5*d^2 - 4*a^6*c^4*d^3 + 6*a^4*c^3*d^4 - 4*a^2*c^2*d^5 + c*d^6)*x^5 + 7
0*(a^8*c^6*d - 4*a^6*c^5*d^2 + 6*a^4*c^4*d^3 - 4*a^2*c^3*d^4 + c^2*d^5)*x^3
 + 35*(a^8*c^7 - 4*a^6*c^6*d + 6*a^4*c^5*d^2 - 4*a^2*c^4*d^3 + c^3*d^4)*x)*
arctan(a*x))*sqrt(d*x^2 + c))/(a^8*c^12 - 4*a^6*c^11*d + 6*a^4*c^10*d^2 - 4
*a^2*c^9*d^3 + c^8*d^4 + (a^8*c^8*d^4 - 4*a^6*c^7*d^5 + 6*a^4*c^6*d^6 - 4*a
^2*c^5*d^7 + c^4*d^8)*x^8 + 4*(a^8*c^9*d^3 - 4*a^6*c^8*d^4 + 6*a^4*c^7*d^5
- 4*a^2*c^6*d^6 + c^5*d^7)*x^6 + 6*(a^8*c^10*d^2 - 4*a^6*c^9*d^3 + 6*a^4*c^
8*d^4 - 4*a^2*c^7*d^5 + c^6*d^6)*x^4 + 4*(a^8*c^11*d - 4*a^6*c^10*d^2 + 6*a
^4*c^9*d^3 - 4*a^2*c^8*d^4 + c^7*d^5)*x^2), 1/210*(3*(35*a^6*c^7 - 70*a^4*c
^6*d + 56*a^2*c^5*d^2 + (35*a^6*c^3*d^4 - 70*a^4*c^2*d^5 + 56*a^2*c*d^6 - 1
6*d^7)*x^8 - 16*c^4*d^3 + 4*(35*a^6*c^4*d^3 - 70*a^4*c^3*d^4 + 56*a^2*c^2*d
^5 - 16*c*d^6)*x^6 + 6*(35*a^6*c^5*d^2 - 70*a^4*c^4*d^3 + 56*a^2*c^3*d^4 -
16*c^2*d^5)*x^4 + 4*(35*a^6*c^6*d - 70*a^4*c^5*d^2 + 56*a^2*c^4*d^3 - 16*c^
3*d^4)*x^2)*sqrt(-a^2*c + d)*arctan(-1/2*(a^2*d*x^2 + 2*a^2*c - d)*sqrt(-a^
2*c + d)*sqrt(d*x^2 + c)/(a^3*c^2 - a*c*d + (a^3*c*d - a*d^2)*x^2)) - 2*(71
*a^7*c^7 - 160*a^5*c^6*d + 122*a^3*c^5*d^2 - 33*a*c^4*d^3 + 3*(19*a^7*c^4*d
^3 - 41*a^5*c^3*d^4 + 30*a^3*c^2*d^5 - 8*a*c*d^6)*x^6 + (182*a^7*c^5*d^2 -
397*a^5*c^4*d^3 + 293*a^3*c^3*d^4 - 78*a*c^2*d^5)*x^4 + (196*a^7*c^6*d - 43
4*a^5*c^5*d^2 + 325*a^3*c^4*d^3 - 87*a*c^3*d^4)*x^2 - 3*(16*(a^8*c^4*d^3 -
4*a^6*c^3*d^4 + 6*a^4*c^2*d^5 - 4*a^2*c*d^6 + d^7)*x^7 + 56*(a^8*c^5*d^2 -
4*a^6*c^4*d^3 + 6*a^4*c^3*d^4 - 4*a^2*c^2*d^5 + c*d^6)*x^5 + 70*(a^8*c^6*d
- 4*a^6*c^5*d^2 + 6*a^4*c^4*d^3 - 4*a^2*c^3*d^4 + c^2*d^5)*x^3 + 35*(a^8*c^
7 - 4*a^6*c^6*d + 6*a^4*c^5*d^2 - 4*a^2*c^4*d^3 + c^3*d^4)*x)*arctan(a*x))*
sqrt(d*x^2 + c))/(a^8*c^12 - 4*a^6*c^11*d + 6*a^4*c^10*d^2 - 4*a^2*c^9*d^3
+ c^8*d^4 + (a^8*c^8*d^4 - 4*a^6*c^7*d^5 + 6*a^4*c^6*d^6 - 4*a^2*c^5*d^7 +
c^4*d^8)*x^8 + 4*(a^8*c^9*d^3 - 4*a^6*c^8*d^4 + 6*a^4*c^7*d^5 - 4*a^2*c^6*d
^6 + c^5*d^7)*x^6 + 6*(a^8*c^10*d^2 - 4*a^6*c^9*d^3 + 6*a^4*c^8*d^4 - 4*a^2
*c^7*d^5 + c^6*d^6)*x^4 + 4*(a^8*c^11*d - 4*a^6*c^10*d^2 + 6*a^4*c^9*d^3 -
4*a^2*c^8*d^4 + c^7*d^5)*x^2)]
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(d*x^2+c)^(9/2),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.20, size = 0, normalized size = 0.00

$$\int \frac{\arctan(ax)}{(d\,x^2+c)^{\frac{9}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(a*x)/(d*x^2+c)^(9/2),x)
```

```
[Out] int(arctan(a*x)/(d*x^2+c)^(9/2),x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: ValueError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(a*x)/(d*x^2+c)^(9/2),x, algorithm="maxima")
```

```
[Out] Exception raised: ValueError >> Computation failed since Maxima requested a
dditional constraints; using the 'assume' command before evaluation *may* h
elp (example of legal syntax is 'assume(d-a^2*c>0)', see `assume?` for more
 details)Is d-a^2*c positive or negative?
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\mathrm{atan}\left(a\,x\right)}{{\left(d\,x^2+c\right)}^{9/2}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(atan(a*x)/(c + d*x^2)^(9/2),x)
```

```
[Out] int(atan(a*x)/(c + d*x^2)^(9/2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\operatorname{atan}{\left(ax \right)}}{\left(c + dx^{2}\right)^{\frac{9}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(a*x)/(d*x**2+c)**(9/2),x)
```

```
[Out] Integral(atan(a*x)/(c + d*x**2)**(9/2), x)
```

3.1228 $\int x^m \left(d+ex^2\right)^3 \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=378

$$\frac{d^3x^{m+1}\left(a+b\tan^{-1}(cx)\right)}{m+1}+\frac{3d^2ex^{m+3}\left(a+b\tan^{-1}(cx)\right)}{m+3}+\frac{3de^2x^{m+5}\left(a+b\tan^{-1}(cx)\right)}{m+5}+\frac{e^3x^{m+7}\left(a+b\tan^{-1}(cx)\right)}{m+7}+- b$$

```
[Out] -b*e*(e^2*(m^2+8*m+15)-3*c^2*d*e*(m^2+10*m+21)+3*c^4*d^2*(m^2+12*m+35))*x^(
2+m)/c^5/(2+m)/(7+m)/(m^2+8*m+15)+b*e^2*(e*(5+m)-3*c^2*d*(7+m))*x^(4+m)/c^3
/(4+m)/(5+m)/(7+m)-b*e^3*x^(6+m)/c/(6+m)/(7+m)+d^3*x^(1+m)*(a+b*arctan(c*x)
)/(1+m)+3*d^2*e*x^(3+m)*(a+b*arctan(c*x))/(3+m)+3*d*e^2*x^(5+m)*(a+b*arctan
(c*x))/(5+m)+e^3*x^(7+m)*(a+b*arctan(c*x))/(7+m)+b*(e^3*(m^3+9*m^2+23*m+15)
-3*c^2*d*e^2*(m^3+11*m^2+31*m+21)+3*c^4*d^2*e*(m^3+13*m^2+47*m+35)-c^6*d^3*
(m^3+15*m^2+71*m+105))*x^(2+m)*hypergeom([1, 1+1/2*m],[2+1/2*m],-c^2*x^2)/c
^5/(m^2+12*m+35)/(m^3+6*m^2+11*m+6)
```

Rubi [A] time = 1.98, antiderivative size = 374, normalized size of antiderivative = 0.99, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {270, 4976, 1802, 364}

$$\frac{3d^2ex^{m+3}\left(a+b\tan^{-1}(cx)\right)}{m+3}+\frac{d^3x^{m+1}\left(a+b\tan^{-1}(cx)\right)}{m+1}+\frac{3de^2x^{m+5}\left(a+b\tan^{-1}(cx)\right)}{m+5}+\frac{e^3x^{m+7}\left(a+b\tan^{-1}(cx)\right)}{m+7}+- b$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] -((b*e*(e^2*(15 + 8*m + m^2) - 3*c^2*d*e*(21 + 10*m + m^2) + 3*c^4*d^2*(35
+ 12*m + m^2))*x^(2 + m))/(c^5*(2 + m)*(3 + m)*(5 + m)*(7 + m))) - (b*e^2*(
(3*c^2*d)/(5 + m) - e/(7 + m))*x^(4 + m))/(c^3*(4 + m)) - (b*e^3*x^(6 + m))
/(c*(6 + m)*(7 + m)) + (d^3*x^(1 + m)*(a + b*ArcTan[c*x]))/(1 + m) + (3*d^2
*e*x^(3 + m)*(a + b*ArcTan[c*x]))/(3 + m) + (3*d*e^2*x^(5 + m)*(a + b*ArcTa
n[c*x]))/(5 + m) + (e^3*x^(7 + m)*(a + b*ArcTan[c*x]))/(7 + m) + (b*(e^3*(1
5 + 23*m + 9*m^2 + m^3) - 3*c^2*d*e^2*(21 + 31*m + 11*m^2 + m^3) + 3*c^4*d^
2*e*(35 + 47*m + 13*m^2 + m^3) - c^6*d^3*(105 + 71*m + 15*m^2 + m^3))*x^(2
+ m)*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, -(c^2*x^2)])/(c^5*(1 + m)*(
2 + m)*(3 + m)*(5 + m)*(7 + m))
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^m \left(d+ex^2\right)^3 \left(a+b\tan^{-1}(cx)\right) dx = \frac{d^3x^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m} + \frac{3d^2ex^{3+m}\left(a+b\tan^{-1}(cx)\right)}{3+m} + \frac{3de^2x^{5+m}\left(\right.}{5}$$

$$= \frac{d^3x^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m} + \frac{3d^2ex^{3+m}\left(a+b\tan^{-1}(cx)\right)}{3+m} + \frac{3de^2x^{5+m}\left(\right.}{5}$$

$$= -\frac{be\left(e^2\left(15+8m+m^2\right)-3c^2de\left(21+10m+m^2\right)+3c^4d^2\left(35+12m\right.\right.}{c^5(2+m)(3+m)(5+m)(7+m)}$$

$$= -\frac{be\left(e^2\left(15+8m+m^2\right)-3c^2de\left(21+10m+m^2\right)+3c^4d^2\left(35+12m\right.\right.}{c^5(2+m)(3+m)(5+m)(7+m)}$$

Mathematica [A] time = 0.61, size = 264, normalized size = 0.70

$$x^{m+1}\left(\frac{d^3\left(a+b\tan^{-1}(cx)\right)}{m+1} + \frac{3d^2ex^2\left(a+b\tan^{-1}(cx)\right)}{m+3} + \frac{3de^2x^4\left(a+b\tan^{-1}(cx)\right)}{m+5} + \frac{e^3x^6\left(a+b\tan^{-1}(cx)\right)}{m+7} - \right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d + e*x^2)^3*(a + b*ArcTan[c*x]),x]
```

```
[Out] x^(1 + m)*((d^3*(a + b*ArcTan[c*x]))/(1 + m) + (3*d^2*e*x^2*(a + b*ArcTan[c
*x]))/(3 + m) + (3*d*e^2*x^4*(a + b*ArcTan[c*x]))/(5 + m) + (e^3*x^6*(a + b
*ArcTan[c*x]))/(7 + m) - (b*c*e^3*x^7*Hypergeometric2F1[1, 4 + m/2, 5 + m/2
, -(c^2*x^2)])/((7 + m)*(8 + m)) - (b*c*d^3*x*Hypergeometric2F1[1, (2 + m)/
2, (4 + m)/2, -(c^2*x^2)])/(2 + 3*m + m^2) - (3*b*c*d^2*e*x^3*Hypergeometri
c2F1[1, (4 + m)/2, (6 + m)/2, -(c^2*x^2)])/(12 + 7*m + m^2) - (3*b*c*d*e^2*
x^5*Hypergeometric2F1[1, (6 + m)/2, (8 + m)/2, -(c^2*x^2)])/((5 + m)*(6 + m
)))
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(ae^3x^6 + 3\,ade^2x^4 + 3\,ad^2ex^2 + ad^3 + \left(be^3x^6 + 3\,bde^2x^4 + 3\,bd^2ex^2 + bd^3\right)\arctan\left(cx\right)\right)x^m, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e^3*x^6 + 3*a*d*e^2*x^4 + 3*a*d^2*e*x^2 + a*d^3 + (b*e^3*x^6 +
3*b*d*e^2*x^4 + 3*b*d^2*e*x^2 + b*d^3)*arctan(c*x))*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.94, size = 0, normalized size = 0.00

$$\int x^m \left(e\,x^2+d\right)^3 (a+b\arctan(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(e*x^2+d)^3*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^m*(e*x^2+d)^3*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{ae^3x^{m+7}}{m+7}+\frac{3\,ade^2x^{m+5}}{m+5}+\frac{3\,ad^2ex^{m+3}}{m+3}+\frac{ad^3x^{m+1}}{m+1}+\frac{\left(\left(be^3m^3+9\,be^3m^2+23\,be^3m+15\,be^3\right)x^7+3\left(bde^2m^3+11\,bde^2m\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^3*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] a*e^3*x^(m + 7)/(m + 7) + 3*a*d*e^2*x^(m + 5)/(m + 5) + 3*a*d^2*e*x^(m + 3)
/(m + 3) + a*d^3*x^(m + 1)/(m + 1) + (((b*e^3*m^3 + 9*b*e^3*m^2 + 23*b*e^3*
m + 15*b*e^3)*x^7 + 3*(b*d*e^2*m^3 + 11*b*d*e^2*m^2 + 31*b*d*e^2*m + 21*b*d
*e^2)*x^5 + 3*(b*d^2*e*m^3 + 13*b*d^2*e*m^2 + 47*b*d^2*e*m + 35*b*d^2*e)*x^
3 + (b*d^3*m^3 + 15*b*d^3*m^2 + 71*b*d^3*m + 105*b*d^3)*x)*x^m*arctan(c*x)
- (m^4 + 16*m^3 + 86*m^2 + 176*m + 105)*integrate(((b*c*e^3*m^3 + 9*b*c*e^3
*m^2 + 23*b*c*e^3*m + 15*b*c*e^3)*x^7 + 3*(b*c*d*e^2*m^3 + 11*b*c*d*e^2*m^2
 + 31*b*c*d*e^2*m + 21*b*c*d*e^2)*x^5 + 3*(b*c*d^2*e*m^3 + 13*b*c*d^2*e*m^2
 + 47*b*c*d^2*e*m + 35*b*c*d^2*e)*x^3 + (b*c*d^3*m^3 + 15*b*c*d^3*m^2 + 71*
b*c*d^3*m + 105*b*c*d^3)*x)*x^m/(m^4 + 16*m^3 + (c^2*m^4 + 16*c^2*m^3 + 86*
c^2*m^2 + 176*c^2*m + 105*c^2)*x^2 + 86*m^2 + 176*m + 105), x))/(m^4 + 16*m
^3 + 86*m^2 + 176*m + 105)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^3 \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^3,x)
```

```
[Out] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{m} \left(a + b \operatorname{atan}{\left(cx \right)}\right) \left(d + ex^{2}\right)^{3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(e*x**2+d)**3*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**m*(a + b*atan(c*x))*(d + e*x**2)**3, x)
```

3.1229 $\int x^m \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=230

$$\frac{d^2x^{m+1}\left(a+b\tan^{-1}(cx)\right)}{m+1}+\frac{2dex^{m+3}\left(a+b\tan^{-1}(cx)\right)}{m+3}+\frac{e^2x^{m+5}\left(a+b\tan^{-1}(cx)\right)}{m+5}+\frac{bex^{m+2}\left(e(m+3)-2c^2d(m-\right.}{c^3(m+2)(m+3)(m+5}$$

```
[Out] b*e*(e*(3+m)-2*c^2*d*(5+m))*x^(2+m)/c^3/(5+m)/(m^2+5*m+6)-b*e^2*x^(4+m)/c/(
4+m)/(5+m)+d^2*x^(1+m)*(a+b*arctan(c*x))/(1+m)+2*d*e*x^(3+m)*(a+b*arctan(c*
x))/(3+m)+e^2*x^(5+m)*(a+b*arctan(c*x))/(5+m)-b*(e^2*(m^2+4*m+3)-2*c^2*d*e*
(m^2+6*m+5)+c^4*d^2*(m^2+8*m+15))*x^(2+m)*hypergeom([1, 1+1/2*m],[2+1/2*m],
-c^2*x^2)/c^3/(m^2+3*m+2)/(m^2+8*m+15)
```

Rubi [A] time = 0.29, antiderivative size = 226, normalized size of antiderivative = 0.98, number of steps used = 4, number of rules used = 4, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.190, Rules used = {270, 4976, 1261, 364}

$$\frac{d^2x^{m+1}\left(a+b\tan^{-1}(cx)\right)}{m+1}+\frac{2dex^{m+3}\left(a+b\tan^{-1}(cx)\right)}{m+3}+\frac{e^2x^{m+5}\left(a+b\tan^{-1}(cx)\right)}{m+5}-\frac{bx^{m+2}\left(c^4d^2\left(m^2+8m+15\right)\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] -((b*e*((2*c^2*d)/(3 + m) - e/(5 + m))*x^(2 + m))/(c^3*(2 + m))) - (b*e^2*x
^(4 + m))/(c*(4 + m)*(5 + m)) + (d^2*x^(1 + m)*(a + b*ArcTan[c*x]))/(1 + m)
 + (2*d*e*x^(3 + m)*(a + b*ArcTan[c*x]))/(3 + m) + (e^2*x^(5 + m)*(a + b*Ar
cTan[c*x]))/(5 + m) - (b*(e^2*(3 + 4*m + m^2) - 2*c^2*d*e*(5 + 6*m + m^2) +
 c^4*d^2*(15 + 8*m + m^2))*x^(2 + m)*Hypergeometric2F1[1, (2 + m)/2, (4 + m
)/2, -(c^2*x^2)])/(c^3*(1 + m)*(2 + m)*(3 + m)*(5 + m))
```

Rule 270

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.), x_Symbol] :> Int[Exp
andIntegrand[(c*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, m, n}, x] &&
IGtQ[p, 0]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 1261

```
Int[((f_.)*(x_))^(m_.)*((d_) + (e_.)*(x_)^2)^(q_.)*((a_) + (b_.)*(x_)^2 + (
c_.)*(x_)^4)^(p_.), x_Symbol] :> Int[ExpandIntegrand[(f*x)^m*(d + e*x^2)^q*
(a + b*x^2 + c*x^4)^p, x], x] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && NeQ[
b^2 - 4*a*c, 0] && IGtQ[p, 0] && IGtQ[q, -2]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] && !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] && !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] && !ILtQ[(m
```

```
- 1)/2, 0]))
```

Rubi steps

$$\int x^m \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)\,dx = \frac{d^2x^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m} + \frac{2dex^{3+m}\left(a+b\tan^{-1}(cx)\right)}{3+m} + \frac{e^2x^{5+m}\left(a+b\,\mathrm{ta}\right.}{5+m}$$

$$= \frac{d^2x^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m} + \frac{2dex^{3+m}\left(a+b\tan^{-1}(cx)\right)}{3+m} + \frac{e^2x^{5+m}\left(a+b\,\mathrm{ta}\right.}{5+m}$$

$$= -\frac{be\left(\frac{2c^2d}{3+m}-\frac{e}{5+m}\right)x^{2+m}}{c^3(2+m)} - \frac{be^2x^{4+m}}{c(4+m)(5+m)} + \frac{d^2x^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m} +$$

$$= -\frac{be\left(\frac{2c^2d}{3+m}-\frac{e}{5+m}\right)x^{2+m}}{c^3(2+m)} - \frac{be^2x^{4+m}}{c(4+m)(5+m)} + \frac{d^2x^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m} +$$

Mathematica [A] time = 0.22, size = 193, normalized size = 0.84

$$x^{m+1}\left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)}{m+1} + \frac{2dex^2\left(a+b\tan^{-1}(cx)\right)}{m+3} + \frac{e^2x^4\left(a+b\tan^{-1}(cx)\right)}{m+5} - \frac{bcd^2x\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-c^2x^2\right)}{m^2+3m+2} -\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d + e*x^2)^2*(a + b*ArcTan[c*x]),x]
```

```
[Out] x^(1 + m)*((d^2*(a + b*ArcTan[c*x]))/(1 + m) + (2*d*e*x^2*(a + b*ArcTan[c*x
]))/(3 + m) + (e^2*x^4*(a + b*ArcTan[c*x]))/(5 + m) - (b*c*d^2*x*Hypergeome
tric2F1[1, (2 + m)/2, (4 + m)/2, -(c^2*x^2)])/(2 + 3*m + m^2) - (2*b*c*d*e*
x^3*Hypergeometric2F1[1, (4 + m)/2, (6 + m)/2, -(c^2*x^2)])/(12 + 7*m + m^2
) - (b*c*e^2*x^5*Hypergeometric2F1[1, (6 + m)/2, (8 + m)/2, -(c^2*x^2)])/((
5 + m)*(6 + m)))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\arctan(cx)\right)x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.54, size = 0, normalized size = 0.00

$$\int x^m\left(e\,x^2+d\right)^2\left(a+b\arctan(cx)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(e*x^2+d)^2*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^m*(e*x^2+d)^2*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{ae^2x^{m+5}}{m+5}+\frac{2\,adex^{m+3}}{m+3}+\frac{ad^2x^{m+1}}{m+1}+\frac{\left(\left(be^2m^2+4\,be^2m+3\,be^2\right)x^5+2\left(bdem^2+6\,bdem+5\,bde\right)x^3+\left(bd^2m^2+8\,b\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^2*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] a*e^2*x^(m + 5)/(m + 5) + 2*a*d*e*x^(m + 3)/(m + 3) + a*d^2*x^(m + 1)/(m +
1) + (((b*e^2*m^2 + 4*b*e^2*m + 3*b*e^2)*x^5 + 2*(b*d*e*m^2 + 6*b*d*e*m + 5
*b*d*e)*x^3 + (b*d^2*m^2 + 8*b*d^2*m + 15*b*d^2)*x)*x^m*arctan(c*x) - (m^3
+ 9*m^2 + 23*m + 15)*integrate(((b*c*e^2*m^2 + 4*b*c*e^2*m + 3*b*c*e^2)*x^5
 + 2*(b*c*d*e*m^2 + 6*b*c*d*e*m + 5*b*c*d*e)*x^3 + (b*c*d^2*m^2 + 8*b*c*d^2
*m + 15*b*c*d^2)*x)*x^m/(m^3 + (c^2*m^3 + 9*c^2*m^2 + 23*c^2*m + 15*c^2)*x^
2 + 9*m^2 + 23*m + 15), x))/(m^3 + 9*m^2 + 23*m + 15)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^m\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^2,x)
```

```
[Out] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{m}\left(a+b\operatorname{atan}{\left(cx\right)}\right)\left(d+ex^{2}\right)^{2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(e*x**2+d)**2*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**m*(a + b*atan(c*x))*(d + e*x**2)**2, x)
```

3.1230 $\int x^m \left(d+ex^2\right) \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=122

$$\frac{dx^{m+1}\left(a+b\tan^{-1}(cx)\right)}{m+1}+\frac{ex^{m+3}\left(a+b\tan^{-1}(cx)\right)}{m+3}-\frac{bx^{m+2}\left(\frac{c^2d}{m+1}-\frac{e}{m+3}\right){}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-c^2x^2\right)}{c(m+2)}-\frac{bex^{m+2}}{c\left(m^2+5m+6\right.}$$

```
[Out] -b*e*x^(2+m)/c/(m^2+5*m+6)+d*x^(1+m)*(a+b*arctan(c*x))/(1+m)+e*x^(3+m)*(a+b
*arctan(c*x))/(3+m)-b*(c^2*d/(1+m)-e/(3+m))*x^(2+m)*hypergeom([1, 1+1/2*m],
[2+1/2*m],-c^2*x^2)/c/(2+m)
```

Rubi [A] time = 0.13, antiderivative size = 122, normalized size of antiderivative = 1.00, number of steps used = 3, number of rules used = 4, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.210, Rules used = {14, 4976, 459, 364}

$$\frac{dx^{m+1}\left(a+b\tan^{-1}(cx)\right)}{m+1}+\frac{ex^{m+3}\left(a+b\tan^{-1}(cx)\right)}{m+3}-\frac{bx^{m+2}\left(\frac{c^2d}{m+1}-\frac{e}{m+3}\right){}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-c^2x^2\right)}{c(m+2)}-\frac{bex^{m+2}}{c\left(m^2+5m+6\right.}$$

Antiderivative was successfully verified.

```
[In] Int[x^m*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] -((b*e*x^(2 + m))/(c*(6 + 5*m + m^2))) + (d*x^(1 + m)*(a + b*ArcTan[c*x]))/
(1 + m) + (e*x^(3 + m)*(a + b*ArcTan[c*x]))/(3 + m) - (b*((c^2*d)/(1 + m) -
 e/(3 + m))*x^(2 + m)*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, -(c^2*x^2)
])/(c*(2 + m))
```

Rule 14

```
Int[(u_)*((c_.)*(x_))^(m_.), x_Symbol] :> Int[ExpandIntegrand[(c*x)^m*u, x]
, x] /; FreeQ[{c, m}, x] && SumQ[u] &&  !LinearQ[u, x] &&  !MatchQ[u, (a_)
+ (b_.)*(v_) /; FreeQ[{a, b}, x] && InverseFunctionQ[v]]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^m\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)dx=\frac{dx^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m}+\frac{ex^{3+m}\left(a+b\tan^{-1}(cx)\right)}{3+m}-(bc)\int\frac{x^{1+m}\left(\frac{d}{1+m}\right.}{1+c}$$

$$=-\frac{bex^{2+m}}{c\left(6+5m+m^2\right)}+\frac{dx^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m}+\frac{ex^{3+m}\left(a+b\tan^{-1}(cx)\right.}{3+m}$$

$$=-\frac{bex^{2+m}}{c\left(6+5m+m^2\right)}+\frac{dx^{1+m}\left(a+b\tan^{-1}(cx)\right)}{1+m}+\frac{ex^{3+m}\left(a+b\tan^{-1}(cx)\right.}{3+m}$$

Mathematica [A] time = 0.19, size = 119, normalized size = 0.98

$$x^{m+1}\left(\frac{\frac{\left(d(m+3)+e(m+1)x^2\right)\left(a+b\tan^{-1}(cx)\right)}{m+1}-\frac{bcex^3\,{}_2F_1\left(1,\frac{m+4}{2};\frac{m+6}{2};-c^2x^2\right)}{m+4}}{m+3}-\frac{bcdx\,{}_2F_1\left(1,\frac{m+2}{2};\frac{m+4}{2};-c^2x^2\right)}{m^2+3m+2}\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^m*(d + e*x^2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] x^(1 + m)*(-((b*c*d*x*Hypergeometric2F1[1, (2 + m)/2, (4 + m)/2, -(c^2*x^2)
])/(2 + 3*m + m^2)) + (((d*(3 + m) + e*(1 + m)*x^2)*(a + b*ArcTan[c*x]))/(1
 + m) - (b*c*e*x^3*Hypergeometric2F1[1, (4 + m)/2, (6 + m)/2, -(c^2*x^2)])/
(4 + m))/(3 + m))
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(aex^2+ad+\left(bex^2+bd\right)\arctan(cx)\right)x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*x^m, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 1.23, size = 0, normalized size = 0.00

$$\int x^m\left(ex^2+d\right)(a+b\arctan(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(e*x^2+d)*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^m*(e*x^2+d)*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{aex^{m+3}}{m+3}+\frac{adx^{m+1}}{m+1}+\frac{\left((bem+be)x^3+(bdm+3\,bd)x\right)x^m\arctan\left(cx\right)-\left(m^2+4\,m+3\right)\int\frac{\left((bcem+bce)x^3+(bcdm+3\,bcd)x\right)x^m}{\left(c^2m^2+4\,c^2m+3\,c^2\right)x^2+m^2+4\,m+3}}{m^2+4\,m+3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] a*e*x^(m + 3)/(m + 3) + a*d*x^(m + 1)/(m + 1) + (((b*e*m + b*e)*x^3 + (b*d*
m + 3*b*d)*x)*x^m*arctan(c*x) - (m^2 + 4*m + 3)*integrate(((b*c*e*m + b*c*e
)*x^3 + (b*c*d*m + 3*b*c*d)*x)*x^m/((c^2*m^2 + 4*c^2*m + 3*c^2)*x^2 + m^2 +
 4*m + 3), x))/(m^2 + 4*m + 3)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int x^m\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*atan(c*x))*(d + e*x^2),x)
```

```
[Out] int(x^m*(a + b*atan(c*x))*(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m\left(a+b\,\mathrm{atan}\left(cx\right)\right)\left(d+ex^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(e*x**2+d)*(a+b*atan(c*x)),x)
```

```
[Out] Integral(x**m*(a + b*atan(c*x))*(d + e*x**2), x)
```

3.1231 $\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx$

Optimal. Leaf size=63

$$b\text{Int}\left(\frac{x^m\tan^{-1}(cx)}{d+ex^2},x\right)+\frac{ax^{m+1}\,{}_2F_1\left(1,\frac{m+1}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)}$$

[Out] a*x^(1+m)*hypergeom([1, 1/2+1/2*m],[3/2+1/2*m],-e*x^2/d)/d/(1+m)+b*Unintegrable(x^m*arctan(c*x)/(e*x^2+d),x)

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

[In] Int[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2),x]

[Out] (a*x^(1 + m)*Hypergeometric2F1[1, (1 + m)/2, (3 + m)/2, -((e*x^2)/d)])/(d*(1 + m)) + b*Defer[Int][(x^m*ArcTan[c*x])/(d + e*x^2), x]

Rubi steps

$$\begin{aligned}\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx &= a\int \frac{x^m}{d+ex^2}\,dx+b\int \frac{x^m\tan^{-1}(cx)}{d+ex^2}\,dx\\ &= \frac{ax^{1+m}\,{}_2F_1\left(1,\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{d(1+m)}+b\int \frac{x^m\tan^{-1}(cx)}{d+ex^2}\,dx\end{aligned}$$

Mathematica [A] time = 2.39, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

[In] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2),x]

[Out] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2), x]

fricas [A] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(b\arctan(cx)+a)x^m}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="fricas")

[Out] integral((b*arctan(c*x) + a)*x^m/(e*x^2 + d), x)

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="giac")
[Out] Timed out
```

maple [A]   time = 2.01, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a+b \arctan \left(c x\right)\right)}{e \,x^{2}+d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arctan(c*x))/(e*x^2+d),x)
[Out] int(x^m*(a+b*arctan(c*x))/(e*x^2+d),x)
```

maxima [A]   time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b \arctan(cx) + a)x^{m}}{ex^{2} + d}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d),x, algorithm="maxima")
[Out] integrate((b*arctan(c*x) + a)*x^m/(e*x^2 + d), x)
```

mupad [A]   time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^m\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{e\,x^2+d} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*atan(c*x)))/(d + e*x^2),x)
[Out] int((x^m*(a + b*atan(c*x)))/(d + e*x^2), x)
```

sympy [F(-1)]   time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*atan(c*x))/(e*x**2+d),x)
[Out] Timed out
```

3.1232 $\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=63

$$b\text{Int}\left(\frac{x^m\tan^{-1}(cx)}{\left(d+ex^2\right)^2},x\right)+\frac{ax^{m+1}\,{}_2F_1\left(2,\frac{m+1}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d^2(m+1)}$$

```
[Out] a*x^(1+m)*hypergeom([2, 1/2+1/2*m],[3/2+1/2*m],-e*x^2/d)/d^2/(1+m)+b*Uninte
grable(x^m*arctan(c*x)/(e*x^2+d)^2,x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] (a*x^(1 + m)*Hypergeometric2F1[2, (1 + m)/2, (3 + m)/2, -((e*x^2)/d)])/(d^2
*(1 + m)) + b*Defer[Int][(x^m*ArcTan[c*x])/(d + e*x^2)^2, x]
```

Rubi steps

$$\begin{aligned}\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx &= a\int \frac{x^m}{\left(d+ex^2\right)^2}\,dx+b\int \frac{x^m\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx\\ &= \frac{ax^{1+m}\,{}_2F_1\left(2,\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{d^2(1+m)}+b\int \frac{x^m\tan^{-1}(cx)}{\left(d+ex^2\right)^2}\,dx\end{aligned}$$

Mathematica [A] time = 5.53, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^2,x]
```

```
[Out] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^2, x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(b\arctan(cx)+a)x^m}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*x^m/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

giac [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

maple [**A**] time = 1.13, size = 0, normalized size = 0.00

$$\int \frac{x^{m} \left(a+b \arctan \left(c x\right)\right)}{\left(e \,x^{2}+d\right)^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^2,x)
[Out] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^2,x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{{\left(b \arctan\left(c x\right) + a\right)} x^{m}}{{\left(e x^{2} + d\right)}^{2}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^2,x, algorithm="maxima")
[Out] integrate((b*arctan(c*x) + a)*x^m/(e*x^2 + d)^2, x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.02

$$\int \frac{x^m\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}{{\left(e\,x^2+d\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^2,x)
[Out] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*atan(c*x))/(e*x**2+d)**2,x)
[Out] Timed out
```

3.1233 $\int x^m \left(d+ex^2\right)^{5/2} \left(a+b\tan^{-1}(cx)\right) \, dx$

Optimal. Leaf size=76

$$b\text{Int}\left(x^m\tan^{-1}(cx)\left(d+ex^2\right)^{5/2},x\right)+\frac{ax^{m+1}\left(d+ex^2\right)^{7/2}\,{}_2F_1\left(1,\frac{m+8}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)}$$

[Out] a*x^(1+m)*(e*x^2+d)^(7/2)*hypergeom([1, 4+1/2*m],[3/2+1/2*m],-e*x^2/d)/d/(1
+m)+b*Unintegrable(x^m*(e*x^2+d)^(5/2)*arctan(c*x),x)

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

[In] Int[x^m*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]

[Out] (a*d^2*x^(1 + m)*Sqrt[d + e*x^2]*Hypergeometric2F1[-5/2, (1 + m)/2, (3 + m)
/2, -((e*x^2)/d)])/((1 + m)*Sqrt[1 + (e*x^2)/d]) + b*Defer[Int][x^m*(d + e*
x^2)^(5/2)*ArcTan[c*x], x]

Rubi steps

$$\begin{aligned}\int x^m\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)\,dx &= a\int x^m\left(d+ex^2\right)^{5/2}\,dx+b\int x^m\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)\,dx\\ &= b\int x^m\left(d+ex^2\right)^{5/2}\tan^{-1}(cx)\,dx+\frac{\left(ad^2\sqrt{d+ex^2}\right)\int x^m\left(1+\frac{ex^2}{d}\right)^{5/2}}{\sqrt{1+\frac{ex^2}{d}}}\\ &= \frac{ad^2x^{1+m}\sqrt{d+ex^2}\,{}_2F_1\left(-\frac{5}{2},\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{(1+m)\sqrt{1+\frac{ex^2}{d}}}+b\int x^m\left(d+ex^2\right)^{5/2}\text{ta}\end{aligned}$$

Mathematica [A] time = 4.15, size = 0, normalized size = 0.00

$$\int x^m\left(d+ex^2\right)^{5/2}\left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

[In] Integrate[x^m*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]),x]

[Out] Integrate[x^m*(d + e*x^2)^(5/2)*(a + b*ArcTan[c*x]), x]

fricas [A] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(ae^2x^4+2\,adex^2+ad^2+\left(be^2x^4+2\,bdex^2+bd^2\right)\arctan(cx)\right)\sqrt{ex^2+d}\,x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

[In] integrate(x^m*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="fricas")

[Out] integral((a*e^2*x^4 + 2*a*d*e*x^2 + a*d^2 + (b*e^2*x^4 + 2*b*d*e*x^2 + b*d^
2)*arctan(c*x))*sqrt(e*x^2 + d)*x^m, x)

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2+d\right)^{\frac{5}{2}}(b\arctan\left(cx\right)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((e*x^2 + d)^(5/2)*(b*arctan(c*x) + a)*x^m, x)
```

maple [**A**] time = 1.10, size = 0, normalized size = 0.00

$$\int x^m\left(e\,x^2+d\right)^{\frac{5}{2}}\left(a+b\arctan\left(cx\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
[Out] int(x^m*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2+d\right)^{\frac{5}{2}}(b\arctan\left(cx\right)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(5/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)^(5/2)*(b*arctan(c*x) + a)*x^m, x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int x^m\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^{5/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^(5/2),x)
[Out] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(e*x**2+d)**(5/2)*(a+b*atan(c*x)),x)
[Out] Timed out
```

3.1234 $\int x^m \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=76

$$b\text{Int}\left(x^m \tan^{-1}(cx)\left(d+ex^2\right)^{3/2},x\right)+\frac{ax^{m+1}\left(d+ex^2\right)^{5/2} {}_2F_1\left(1,\frac{m+6}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)}$$

```
[Out] a*x^(1+m)*(e*x^2+d)^(5/2)*hypergeom([1, 3+1/2*m],[3/2+1/2*m],-e*x^2/d)/d/(1
+m)+b*Unintegrable(x^m*(e*x^2+d)^(3/2)*arctan(c*x),x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] (a*d*x^(1 + m)*Sqrt[d + e*x^2]*Hypergeometric2F1[-3/2, (1 + m)/2, (3 + m)/2
, -((e*x^2)/d)])/((1 + m)*Sqrt[1 + (e*x^2)/d]) + b*Defer[Int][x^m*(d + e*x^
2)^(3/2)*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^m \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) dx &= a\int x^m \left(d+ex^2\right)^{3/2} dx+b\int x^m \left(d+ex^2\right)^{3/2} \tan^{-1}(cx)\, dx\\ &= b\int x^m \left(d+ex^2\right)^{3/2} \tan^{-1}(cx)\, dx+\frac{\left(ad\sqrt{d+ex^2}\right)\int x^m \left(1+\frac{ex^2}{d}\right)^{3/2} d}{\sqrt{1+\frac{ex^2}{d}}}\\ &= \frac{adx^{1+m}\sqrt{d+ex^2}\, {}_2F_1\left(-\frac{3}{2},\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{(1+m)\sqrt{1+\frac{ex^2}{d}}}+b\int x^m \left(d+ex^2\right)^{3/2} \tan\end{aligned}$$

Mathematica [A] time = 0.13, size = 0, normalized size = 0.00

$$\int x^m \left(d+ex^2\right)^{3/2} \left(a+b\tan^{-1}(cx)\right) dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^m*(d + e*x^2)^(3/2)*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.51, size = 0, normalized size = 0.00

$$\text{integral}\left(\left(aex^2+ad+\left(bex^2+bd\right)\arctan(cx)\right)\sqrt{ex^2+d}\,x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((a*e*x^2 + a*d + (b*e*x^2 + b*d)*arctan(c*x))*sqrt(e*x^2 + d)*x^m,
 x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2+d\right)^{\frac{3}{2}}(b\arctan(cx)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((e*x^2 + d)^(3/2)*(b*arctan(c*x) + a)*x^m, x)
```

maple [A] time = 1.02, size = 0, normalized size = 0.00

$$\int x^m\left(e\,x^2+d\right)^{\frac{3}{2}}(a+b\arctan(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
[Out] int(x^m*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \left(ex^2+d\right)^{\frac{3}{2}}(b\arctan(cx)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(3/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate((e*x^2 + d)^(3/2)*(b*arctan(c*x) + a)*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int x^m\,(a+b\,\mathrm{atan}(c\,x))\,\left(e\,x^2+d\right)^{3/2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^(3/2),x)
[Out] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(e*x**2+d)**(3/2)*(a+b*atan(c*x)),x)
[Out] Timed out
```

3.1235 $\int x^m \sqrt{d+ex^2} \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=76

$$b\text{Int}\left(x^m\tan^{-1}(cx)\sqrt{d+ex^2},x\right)+\frac{ax^{m+1}\left(d+ex^2\right)^{3/2}{}_2F_1\left(1,\frac{m+4}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)}$$

```
[Out] a*x^(1+m)*(e*x^2+d)^(3/2)*hypergeom([1, 2+1/2*m],[3/2+1/2*m],-e*x^2/d)/d/(1
+m)+b*Unintegrable(x^m*arctan(c*x)*(e*x^2+d)^(1/2),x)
```

Rubi [A] time = 0.15, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] (a*x^(1 + m)*Sqrt[d + e*x^2]*Hypergeometric2F1[-1/2, (1 + m)/2, (3 + m)/2,
-((e*x^2)/d)])/((1 + m)*Sqrt[1 + (e*x^2)/d]) + b*Defer[Int][x^m*Sqrt[d + e*
x^2]*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^m\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx&=a\int x^m\sqrt{d+ex^2}\,dx+b\int x^m\sqrt{d+ex^2}\,\tan^{-1}(cx)\,dx\\&=b\int x^m\sqrt{d+ex^2}\,\tan^{-1}(cx)\,dx+\frac{\left(a\sqrt{d+ex^2}\right)\int x^m\sqrt{1+\frac{ex^2}{d}}\,dx}{\sqrt{1+\frac{ex^2}{d}}}\\&=\frac{ax^{1+m}\sqrt{d+ex^2}\,{}_2F_1\left(-\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{(1+m)\sqrt{1+\frac{ex^2}{d}}}+b\int x^m\sqrt{d+ex^2}\,\tan^{-1}(cx)\end{aligned}$$

Mathematica [A] time = 0.11, size = 0, normalized size = 0.00

$$\int x^m\sqrt{d+ex^2}\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^m*Sqrt[d + e*x^2]*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left(\sqrt{ex^2+d}\,(b\arctan(cx)+a)x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)*x^m, x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ex^2+d}\,(b\arctan(cx)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)*x^m, x)
```

maple [**A**] time = 1.11, size = 0, normalized size = 0.00

$$\int x^m\sqrt{e\,x^2+d}\,\,(a+b\arctan(cx))\,\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
[Out] int(x^m*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \sqrt{ex^2+d}\,(b\arctan(cx)+a)x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^(1/2)*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)*x^m, x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int x^m\,\,(a+b\,\mathrm{atan}\,(c\,x))\,\,\sqrt{e\,x^2+d}\,\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^(1/2),x)
[Out] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^(1/2), x)
```

sympy [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int x^m\,(a+b\,\mathrm{atan}\,(cx))\,\sqrt{d+ex^2}\,\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(e*x**2+d)**(1/2)*(a+b*atan(c*x)),x)
[Out] Integral(x**m*(a + b*atan(c*x))*sqrt(d + e*x**2), x)
```

3.1236 $\int \frac{x^m(a+b\tan^{-1}(cx))}{\sqrt{d+ex^2}}\,dx$

Optimal. Leaf size=76

$$b\text{Int}\left(\frac{x^m\tan^{-1}(cx)}{\sqrt{d+ex^2}},x\right)+\frac{ax^{m+1}\sqrt{d+ex^2}\;{}_2F_1\left(1,\frac{m+2}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)}$$

```
[Out] a*x^(1+m)*hypergeom([1, 1+1/2*m],[3/2+1/2*m],-e*x^2/d)*(e*x^2+d)^(1/2)/d/(1
+m)+b*Unintegrable(x^m*arctan(c*x)/(e*x^2+d)^(1/2),x)
```

Rubi [A] time = 0.16, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] (a*x^(1 + m)*Sqrt[1 + (e*x^2)/d]*Hypergeometric2F1[1/2, (1 + m)/2, (3 + m)/
2, -((e*x^2)/d)])/((1 + m)*Sqrt[d + e*x^2]) + b*Defer[Int][(x^m*ArcTan[c*x]
)/Sqrt[d + e*x^2], x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx &= a\int \frac{x^m}{\sqrt{d+ex^2}}\,dx+b\int \frac{x^m\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx\\
&= b\int \frac{x^m\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx+\frac{\left(a\sqrt{1+\frac{ex^2}{d}}\right)\int \frac{x^m}{\sqrt{1+\frac{ex^2}{d}}}\,dx}{\sqrt{d+ex^2}}\\
&= \frac{ax^{1+m}\sqrt{1+\frac{ex^2}{d}}\;{}_2F_1\left(\frac{1}{2},\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{(1+m)\sqrt{d+ex^2}}+b\int \frac{x^m\tan^{-1}(cx)}{\sqrt{d+ex^2}}\,dx
\end{aligned}$$

Mathematica [A] time = 3.66, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\sqrt{d+ex^2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2],x]
```

```
[Out] Integrate[(x^m*(a + b*ArcTan[c*x]))/Sqrt[d + e*x^2], x]
```

fricas [A] time = 0.77, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{(b\arctan(cx)+a)x^m}{\sqrt{ex^2+d}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*x^m/sqrt(e*x^2 + d), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\arctan(cx) + a)x^m}{\sqrt{ex^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="giac")
[Out] integrate((b*arctan(c*x) + a)*x^m/sqrt(e*x^2 + d), x)
```

maple [A] time = 1.10, size = 0, normalized size = 0.00

$$\int \frac{x^m(a + b\arctan(cx))}{\sqrt{e\,x^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
[Out] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\arctan(cx) + a)x^m}{\sqrt{ex^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(1/2),x, algorithm="maxima")
[Out] integrate((b*arctan(c*x) + a)*x^m/sqrt(e*x^2 + d), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^m\,(a + b\,\mathrm{atan}(c\,x))}{\sqrt{e\,x^2 + d}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^(1/2),x)
[Out] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^(1/2), x)
```

sympy [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^m(a + b\,\mathrm{atan}(cx))}{\sqrt{d + ex^2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*atan(c*x))/(e*x**2+d)**(1/2),x)
[Out] Integral(x**m*(a + b*atan(c*x))/sqrt(d + e*x**2), x)
```

3.1237 $\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$

Optimal. Leaf size=74

$$b\text{Int}\left(\frac{x^m\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}},x\right)+\frac{ax^{m+1}\,{}_2F_1\left(1,\frac{m}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)\sqrt{d+ex^2}}$$

```
[Out] a*x^(1+m)*hypergeom([1, 1/2*m],[3/2+1/2*m],-e*x^2/d)/d/(1+m)/(e*x^2+d)^(1/2
)+b*Unintegrable(x^m*arctan(c*x)/(e*x^2+d)^(3/2),x)
```

Rubi [A] time = 0.17, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] (a*x^(1 + m)*Sqrt[1 + (e*x^2)/d]*Hypergeometric2F1[3/2, (1 + m)/2, (3 + m)/
2, -((e*x^2)/d)])/(d*(1 + m)*Sqrt[d + e*x^2]) + b*Defer[Int][(x^m*ArcTan[c*
x])/(d + e*x^2)^(3/2), x]
```

Rubi steps

$$\begin{aligned}\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx &= a\int \frac{x^m}{\left(d+ex^2\right)^{3/2}}\,dx+b\int \frac{x^m\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx\\ &= b\int \frac{x^m\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx+\frac{\left(a\sqrt{1+\frac{ex^2}{d}}\right)\int \frac{x^m}{\left(1+\frac{ex^2}{d}\right)^{3/2}}\,dx}{d\sqrt{d+ex^2}}\\ &= \frac{ax^{1+m}\sqrt{1+\frac{ex^2}{d}}\,{}_2F_1\left(\frac{3}{2},\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{d(1+m)\sqrt{d+ex^2}}+b\int \frac{x^m\tan^{-1}(cx)}{\left(d+ex^2\right)^{3/2}}\,dx\end{aligned}$$

Mathematica [A] time = 4.63, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{\left(d+ex^2\right)^{3/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^(3/2), x]
```

fricas [A] time = 0.70, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)x^m}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)*x^m/(e^2*x^4 + 2*d*e*x^2 + d^2
), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\arctan(cx) + a)x^m}{(ex^2 + d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="giac")
```

```
[Out] integrate((b*arctan(c*x) + a)*x^m/(e*x^2 + d)^(3/2), x)
```

maple [A] time = 1.03, size = 0, normalized size = 0.00

$$\int \frac{x^m (a + b\arctan(cx))}{(e\,x^2 + d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

```
[Out] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b\arctan(cx) + a)x^m}{(ex^2 + d)^{\frac{3}{2}}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(3/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arctan(c*x) + a)*x^m/(e*x^2 + d)^(3/2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^m\,(a + b\,\mathrm{atan}(c\,x))}{(e\,x^2 + d)^{3/2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^(3/2),x)
```

```
[Out] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^(3/2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*atan(c*x))/(e*x**2+d)**(3/2),x)
```

```
[Out] Timed out
```

3.1238 $\int \frac{x^m(a+b\tan^{-1}(cx))}{(d+ex^2)^{5/2}}\,dx$

Optimal. Leaf size=76

$$b\text{Int}\left(\frac{x^m\tan^{-1}(cx)}{(d+ex^2)^{5/2}},x\right)+\frac{ax^{m+1}\,{}_2F_1\left(1,\frac{m-2}{2};\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)(d+ex^2)^{3/2}}$$

```
[Out] a*x^(1+m)*hypergeom([1, -1+1/2*m],[3/2+1/2*m],-e*x^2/d)/d/(1+m)/(e*x^2+d)^(
3/2)+b*Unintegrable(x^m*arctan(c*x)/(e*x^2+d)^(5/2),x)
```

Rubi [A] time = 0.18, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{(d+ex^2)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] (a*x^(1 + m)*Sqrt[1 + (e*x^2)/d]*Hypergeometric2F1[5/2, (1 + m)/2, (3 + m)/
2, -((e*x^2)/d)])/(d^2*(1 + m)*Sqrt[d + e*x^2]) + b*Defer[Int][(x^m*ArcTan[
c*x])/(d + e*x^2)^(5/2), x]
```

Rubi steps

$$\begin{aligned}
\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{(d+ex^2)^{5/2}}\,dx &= a\int \frac{x^m}{(d+ex^2)^{5/2}}\,dx+b\int \frac{x^m\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx\\
&= b\int \frac{x^m\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx+\frac{\left(a\sqrt{1+\frac{ex^2}{d}}\right)\int \frac{x^m}{\left(1+\frac{ex^2}{d}\right)^{5/2}}\,dx}{d^2\sqrt{d+ex^2}}\\
&= \frac{ax^{1+m}\sqrt{1+\frac{ex^2}{d}}\,{}_2F_1\left(\frac{5}{2},\frac{1+m}{2};\frac{3+m}{2};-\frac{ex^2}{d}\right)}{d^2(1+m)\sqrt{d+ex^2}}+b\int \frac{x^m\tan^{-1}(cx)}{(d+ex^2)^{5/2}}\,dx
\end{aligned}$$

Mathematica [A] time = 6.16, size = 0, normalized size = 0.00

$$\int \frac{x^m\left(a+b\tan^{-1}(cx)\right)}{(d+ex^2)^{5/2}}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2),x]
```

```
[Out] Integrate[(x^m*(a + b*ArcTan[c*x]))/(d + e*x^2)^(5/2), x]
```

fricas [A] time = 0.54, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\sqrt{ex^2+d}\,(b\arctan(cx)+a)x^m}{e^3x^6+3\,de^2x^4+3\,d^2ex^2+d^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="fricas")
```

```
[Out] integral(sqrt(e*x^2 + d)*(b*arctan(c*x) + a)*x^m/(e^3*x^6 + 3*d*e^2*x^4 + 3
*d^2*e*x^2 + d^3), x)
```

giac [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b \arctan(cx) + a)x^m}{\left(ex^2 + d\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="giac")
```

```
[Out] integrate((b*arctan(c*x) + a)*x^m/(e*x^2 + d)^(5/2), x)
```

maple [**A**] time = 1.03, size = 0, normalized size = 0.00

$$\int \frac{x^m (a + b \arctan(cx))}{\left(e\,x^2 + d\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

```
[Out] int(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x)
```

maxima [**A**] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(b \arctan(cx) + a)x^m}{\left(ex^2 + d\right)^{\frac{5}{2}}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(a+b*arctan(c*x))/(e*x^2+d)^(5/2),x, algorithm="maxima")
```

```
[Out] integrate((b*arctan(c*x) + a)*x^m/(e*x^2 + d)^(5/2), x)
```

mupad [**A**] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{x^m\,\left(a + b\,\mathrm{atan}\left(c\,x\right)\right)}{\left(e\,x^2 + d\right)^{5/2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^(5/2),x)
```

```
[Out] int((x^m*(a + b*atan(c*x)))/(d + e*x^2)^(5/2), x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(a+b*atan(c*x))/(e*x**2+d)**(5/2),x)
```

```
[Out] Timed out
```

3.1239 $\int x^m \left(d+ex^2\right)^p \left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=77

$$b\text{Int}\left(x^m\tan^{-1}(cx)\left(d+ex^2\right)^p,x\right)+\frac{ax^{m+1}\left(d+ex^2\right)^{p+1}{}_2F_1\left(1,\frac{1}{2}(m+2p+3);\frac{m+3}{2};-\frac{ex^2}{d}\right)}{d(m+1)}$$

```
[Out] a*x^(1+m)*(e*x^2+d)^(1+p)*hypergeom([1, 3/2+1/2*m+p],[3/2+1/2*m],-e*x^2/d)/
d/(1+m)+b*Unintegrable(x^m*(e*x^2+d)^p*arctan(c*x),x)
```

Rubi [A] time = 0.12, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^m \left(d+ex^2\right)^p \left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Int[x^m*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] (a*x^(1 + m)*(d + e*x^2)^p*Hypergeometric2F1[(1 + m)/2, -p, (3 + m)/2, -((e
*x^2)/d)])/((1 + m)*(1 + (e*x^2)/d)^p) + b*Defer[Int][x^m*(d + e*x^2)^p*Arc
Tan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^m \left(d+ex^2\right)^p \left(a+b\tan^{-1}(cx)\right)\,dx &= a\int x^m \left(d+ex^2\right)^p\,dx+b\int x^m \left(d+ex^2\right)^p\tan^{-1}(cx)\,dx\\ &= b\int x^m \left(d+ex^2\right)^p\tan^{-1}(cx)\,dx+\left(a\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}\right)\int x^m \left(1\right.\\ &= \frac{ax^{1+m}\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}{}_2F_1\left(\frac{1+m}{2},-p;\frac{3+m}{2};-\frac{ex^2}{d}\right)}{1+m}+b\int x^m \left(d+\right.\end{aligned}$$

Mathematica [A] time = 3.35, size = 0, normalized size = 0.00

$$\int x^m \left(d+ex^2\right)^p \left(a+b\tan^{-1}(cx)\right)\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^m*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^m*(d + e*x^2)^p*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.52, size = 0, normalized size = 0.00

$$\text{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^p x^m,x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^m, x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\arctan(cx)+a)\left(ex^2+d\right)^p x^m\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^m, x)
```

maple [A] time = 1.47, size = 0, normalized size = 0.00

$$\int x^{m} \left(e \,x^{2}+d \right)^{p} \left(a +b \arctan \left(c x \right)\right)d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^m*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int {\left(b \arctan\left(c x\right) + a\right)} {\left(e x^{2} + d\right)}^{p} x^{m}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^m*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^m, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int x^m\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^p \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^p,x)
```

```
[Out] int(x^m*(a + b*atan(c*x))*(d + e*x^2)^p, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**m*(e*x**2+d)**p*(a+b*atan(c*x)),x)
```

```
[Out] Timed out
```

3.1240 $\int x^{-2-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$

Optimal. Leaf size=81

$$b\text{Int}\left(x^{-2p-2}\tan^{-1}(cx)\left(d+ex^2\right)^p,x\right)-\frac{ax^{-2p-1}\left(d+ex^2\right)^{p+1}{}_2F_1\left(\frac{1}{2},1;\frac{1}{2}(1-2p);-\frac{ex^2}{d}\right)}{d(2p+1)}$$

```
[Out] -a*x^(-1-2*p)*(e*x^2+d)^(1+p)*hypergeom([1/2, 1],[1/2-p],-e*x^2/d)/d/(1+2*p
)+b*Unintegrable(x^(-2-2*p)*(e*x^2+d)^p*arctan(c*x),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^{-2-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Int[x^(-2 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -((a*x^(-1 - 2*p)*(d + e*x^2)^p*Hypergeometric2F1[(-1 - 2*p)/2, -p, (1 - 2*
p)/2, -((e*x^2)/d)])/((1 + 2*p)*(1 + (e*x^2)/d)^p)) + b*Defer[Int][x^(-2 -
2*p)*(d + e*x^2)^p*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^{-2-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx&=a\int x^{-2-2p}\left(d+ex^2\right)^p\,dx+b\int x^{-2-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx\\&=b\int x^{-2-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx+\left(a\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}\right)\int\\&=-\frac{ax^{-1-2p}\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}{}_2F_1\left(\frac{1}{2}(-1-2p),-p;\frac{1}{2}(1-2p);-\frac{e}{}\right.}{1+2p}\end{aligned}$$

Mathematica [A] time = 3.25, size = 0, normalized size = 0.00

$$\int x^{-2-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^(-2 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^(-2 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 2), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int(b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 2), x)
```

maple [A] time = 1.61, size = 0, normalized size = 0.00

$$\int x^{-2-2p}\left(e\,x^{2}+d\right)^{p}\left(a+b\arctan\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-2-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
[Out] int(x^(-2-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\arctan\left(cx\right)+a)\left(ex^{2}+d\right)^{p}x^{-2\,p-2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-2-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 2), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^p}{x^{2\,p+2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 2),x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-2-2*p)*(e*x**2+d)**p*(a+b*atan(c*x)),x)
[Out] Timed out
```

3.1241 $\int x^{-3-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=129

$$-\frac{x^{-2(p+1)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{2d(p+1)}-\frac{bcx^{-2p-1}\left(d+ex^2\right)^p\left(\frac{ex^2}{d}+1\right)^{-p}F_1\left(\frac{1}{2}(-2p-1);1,-p-1;\frac{1}{2}(1-2p);-\right.}{2\left(2p^2+3p+1\right)}$$

```
[Out] -1/2*b*c*x^(-1-2*p)*(e*x^2+d)^p*AppellF1(-1/2-p,1,-1-p,1/2-p,-c^2*x^2,-e*x^
2/d)/(2*p^2+3*p+1)/((1+e*x^2/d)^p)-1/2*(e*x^2+d)^(1+p)*(a+b*arctan(c*x))/d/
(1+p)/(x^(2+2*p))
```

Rubi [A] time = 0.17, antiderivative size = 129, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 5, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.200, Rules used = {264, 4976, 12, 511, 510}

$$-\frac{x^{-2(p+1)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{2d(p+1)}-\frac{bcx^{-2p-1}\left(d+ex^2\right)^p\left(\frac{ex^2}{d}+1\right)^{-p}F_1\left(\frac{1}{2}(-2p-1);1,-p-1;\frac{1}{2}(1-2p);-\right.}{2\left(2p^2+3p+1\right)}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-3 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*c*x^(-1 - 2*p)*(d + e*x^2)^p*AppellF1[(-1 - 2*p)/2, 1, -1 - p, (1 - 2*p
)/2, -(c^2*x^2), -((e*x^2)/d)])/(2*(1 + 3*p + 2*p^2)*(1 + (e*x^2)/d)^p) - (
(d + e*x^2)^(1 + p)*(a + b*ArcTan[c*x]))/(2*d*(1 + p)*x^(2*(1 + p)))
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 511

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x
^n)/a)^FracPart[p], Int[(e*x)^m*(1 + (b*x^n)/a)^p*(c + d*x^n)^q, x], x] /;
FreeQ[{a, b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &&
 NeQ[m, n - 1] &&  !(IntegerQ[p] || GtQ[a, 0])
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
```

```
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^{-3-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx=-\frac{x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d(1+p)}-(bc)\int-\frac{x^{-2(1+p)}\left(d+ex^2\right)}{2d(1+p)\left(1+c^2x\right.}$$

$$=-\frac{x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d(1+p)}+\frac{(bc)\int\frac{x^{-2(1+p)}\left(d+ex^2\right)^{1+p}}{1+c^2x^2}dx}{2d(1+p)}$$

$$=-\frac{x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d(1+p)}+\frac{\left(bc\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}\right.}{2(1+}$$

$$=-\frac{bcx^{-1-2p}\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}F_1\left(\frac{1}{2}(-1-2p);1,-1-p;\frac{1}{2}(1-2p);\right.}{2\left(1+3p+2p^2\right)}$$

Mathematica [A] time = 0.45, size = 166, normalized size = 1.29

$$-\frac{x^{-2(p+1)}\left(d+ex^2\right)^p\left(\frac{ex^2}{d}+1\right)^{-p}\left(c(2p+1)\left(d+ex^2\right)\left(\frac{ex^2}{d}+1\right)^p\left(a+b\tan^{-1}(cx)\right)+bx\left(c^2d-e\right)F_1\left(-p-\frac{1}{2};-p,1;\right.\right.}{2cd(p+1)(2p+1)}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^(-3 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -1/2*((d + e*x^2)^p*(b*(c^2*d - e)*x*AppellF1[-1/2 - p, -p, 1, 1/2 - p, -((
e*x^2)/d), -(c^2*x^2)] + c*(1 + 2*p)*(d + e*x^2)*(1 + (e*x^2)/d)^p*(a + b*A
rcTan[c*x]) + b*e*x*Hypergeometric2F1[-1/2 - p, -p, 1/2 - p, -((e*x^2)/d)])
)/(c*d*(1 + p)*(1 + 2*p)*x^(2*(1 + p))*(1 + (e*x^2)/d)^p)
```

fricas [F] time = 0.56, size = 0, normalized size = 0.00

$$\text{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-3-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 3), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-3-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
```

```
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 3), x)
```

maple [F] time = 1.52, size = 0, normalized size = 0.00

$$\int x^{-3-2p} \left(e\,x^{2}+d\right)^{p} \left(a+b \arctan \left(c x\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-3-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
[Out] int(x^(-3-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\arctan\left(cx\right)e^{\left(p\log\left(ex^{2}+d\right)-2\,p\log\left(x\right)\right)}}{x^{3}}\,dx-\frac{\left(ex^{2}+d\right)ae^{\left(p\log\left(ex^{2}+d\right)-2\,p\log\left(x\right)\right)}}{2\,d\left(p+1\right)x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-3-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] b*integrate(arctan(c*x)*e^(p*log(e*x^2 + d) - 2*p*log(x))/x^3, x) - 1/2*(e*
x^2 + d)*a*e^(p*log(e*x^2 + d) - 2*p*log(x))/(d*(p + 1)*x^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^p}{x^{2\,p+3}} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 3),x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 3), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-3-2*p)*(e*x**2+d)**p*(a+b*atan(c*x)),x)
[Out] Timed out
```

3.1242 $\int x^{-4-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$

Optimal. Leaf size=81

$$b\text{Int}\left(x^{-2p-4}\tan^{-1}(cx)\left(d+ex^2\right)^p,x\right)-\frac{ax^{-2p-3}\left(d+ex^2\right)^{p+1}{}_2F_1\left(-\frac{1}{2},1;\frac{1}{2}(-2p-1);-\frac{ex^2}{d}\right)}{d(2p+3)}$$

```
[Out] -a*x^(-3-2*p)*(e*x^2+d)^(1+p)*hypergeom([-1/2, 1],[-1/2-p],-e*x^2/d)/d/(3+2
*p)+b*Unintegrable(x^(-4-2*p)*(e*x^2+d)^p*arctan(c*x),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^{-4-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Int[x^(-4 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -((a*x^(-3 - 2*p)*(d + e*x^2)^p*Hypergeometric2F1[(-3 - 2*p)/2, -p, (-1 - 2
*p)/2, -((e*x^2)/d)])/((3 + 2*p)*(1 + (e*x^2)/d)^p)) + b*Defer[Int][x^(-4 -
 2*p)*(d + e*x^2)^p*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^{-4-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx &= a\int x^{-4-2p}\left(d+ex^2\right)^p\,dx+b\int x^{-4-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx\\ &= b\int x^{-4-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx+\left(a\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}\right)\int x^-\\ &= -\frac{ax^{-3-2p}\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}{}_2F_1\left(\frac{1}{2}(-3-2p),-p;\frac{1}{2}(-1-2p);-\frac{ex^2}{d}\right.}{3+2p}\end{aligned}$$

Mathematica [A] time = 3.57, size = 0, normalized size = 0.00

$$\int x^{-4-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^(-4 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^(-4 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.66, size = 0, normalized size = 0.00

$$\text{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-4-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 4), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int(b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-4-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 4), x)
```

maple [A] time = 1.50, size = 0, normalized size = 0.00

$$\int x^{-4-2p}\left(e\,x^{2}+d\right)^{p}\left(a+b\arctan\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-4-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
[Out] int(x^(-4-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\arctan\left(cx\right)+a)\left(ex^{2}+d\right)^{p}x^{-2\,p-4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-4-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 4), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^p}{x^{2\,p+4}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 4),x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 4), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-4-2*p)*(e*x**2+d)**p*(a+b*atan(c*x)),x)
[Out] Timed out
```

3.1243 $\int x^{-5-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$

Optimal. Leaf size=285

$$\frac{ex^{-2(p+1)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{2d^2(p+1)(p+2)}-\frac{x^{-2(p+2)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{2d(p+2)}-\frac{bx^{-2p-3}\left(c^2d(p+1)+e\right)\left(d+ex^2\right.}{}$$

```
[Out] -1/2*b*(e+c^2*d*(1+p))*x^(-3-2*p)*(e*x^2+d)^p*AppellF1(-3/2-p,1,-1-p,-1/2-p
,-c^2*x^2,-e*x^2/d)/c/d/(3+2*p)/(p^2+3*p+2)/((1+e*x^2/d)^p)+1/2*e*(e*x^2+d)
^(1+p)*(a+b*arctan(c*x))/d^2/(1+p)/(2+p)/(x^(2+2*p))-1/2*(e*x^2+d)^(1+p)*(a
+b*arctan(c*x))/d/(2+p)/(x^(4+2*p))+1/2*b*e*x^(-3-2*p)*(e*x^2+d)^p*hypergeo
m([-1-p, -3/2-p],[-1/2-p],-e*x^2/d)/c/d/(2*p^3+9*p^2+13*p+6)/((1+e*x^2/d)^p
)
```

Rubi [A] time = 0.37, antiderivative size = 285, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}=0.360$, Rules used = {271, 264, 4976, 12, 584, 365, 364, 511, 510}

$$\frac{ex^{-2(p+1)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{2d^2(p+1)(p+2)}-\frac{x^{-2(p+2)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{2d(p+2)}-\frac{bx^{-2p-3}\left(c^2d(p+1)+e\right)\left(d+ex^2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-5 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(e + c^2*d*(1 + p))*x^(-3 - 2*p)*(d + e*x^2)^p*AppellF1[(-3 - 2*p)/2, 1
, -1 - p, (-1 - 2*p)/2, -(c^2*x^2), -((e*x^2)/d)])/(2*c*d*(1 + p)*(2 + p)*(
3 + 2*p)*(1 + (e*x^2)/d)^p) + (e*(d + e*x^2)^(1 + p)*(a + b*ArcTan[c*x]))/(
2*d^2*(1 + p)*(2 + p)*x^(2*(1 + p))) - ((d + e*x^2)^(1 + p)*(a + b*ArcTan[c
*x]))/(2*d*(2 + p)*x^(2*(2 + p))) + (b*e*x^(-3 - 2*p)*(d + e*x^2)^p*Hyperge
ometric2F1[(-3 - 2*p)/2, -1 - p, (-1 - 2*p)/2, -((e*x^2)/d)])/(2*c*d*(6 + 1
3*p + 9*p^2 + 2*p^3)*(1 + (e*x^2)/d)^p)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] &&  !IGtQ[p, 0]
 &&  !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 511

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x
^n)/a)^FracPart[p], Int[(e*x)^m*(1 + (b*x^n)/a)^p*(c + d*x^n)^q, x], x] /;
FreeQ[{a, b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &&
 NeQ[m, n - 1] &&  !(IntegerQ[p] || GtQ[a, 0])
```

Rule 584

```
Int[(((g_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((e_) + (f_.)*(x_)^(n
_)))/((c_) + (d_.)*(x_)^(n_)), x_Symbol] :> Int[ExpandIntegrand[((g*x)^m*(a
 + b*x^n)^p*(e + f*x^n))/(c + d*x^n), x], x] /; FreeQ[{a, b, c, d, e, f, g,
 m, p}, x] && IGtQ[n, 0]
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] &&  !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] &&  !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] &&  !ILtQ[(m
 - 1)/2, 0]))
```

Rubi steps

$$\int x^{-5-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx=\frac{ex^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d^2(1+p)(2+p)}-\frac{x^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a+b\right.}{2d(2+p)}$$

$$=\frac{ex^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d^2(1+p)(2+p)}-\frac{x^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a+b\right.}{2d(2+p)}$$

$$=\frac{ex^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d^2(1+p)(2+p)}-\frac{x^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a+b\right.}{2d(2+p)}$$

$$=\frac{ex^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d^2(1+p)(2+p)}-\frac{x^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a+b\right.}{2d(2+p)}$$

$$=\frac{ex^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{2d^2(1+p)(2+p)}-\frac{x^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a+b\right.}{2d(2+p)}$$

$$=-\frac{b\left(e+c^2d(1+p)\right)x^{-3-2p}\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}F_1\left(\frac{1}{2}(-3-2p);1,-1\right.}{2cd(1+p)(2+p)(3+2p)}$$

Mathematica [F] time = 4.63, size = 0, normalized size = 0.00

$$\int x^{-5-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^(-5 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
[Out] Integrate[x^(-5 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]), x]
```

fricas [F] time = 0.55, size = 0, normalized size = 0.00

$$\text{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-5-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 5), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-5-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 5), x)
```

maple [F] time = 1.55, size = 0, normalized size = 0.00

$$\int x^{-5-2p}\left(e\,x^2+d\right)^p\left(a+b\arctan(cx)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-5-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^(-5-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b \int \frac{\arctan(cx)\,e^{\left(p\log\left(ex^2+d\right)-2\,p\log(x)\right)}}{x^5}\,dx + \frac{\left(e^2x^4 - depx^2 - d^2\left(p+1\right)\right)ae^{\left(p\log\left(ex^2+d\right)-2\,p\log(x)\right)}}{2\left(p^2+3\,p+2\right)d^2x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-5-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] b*integrate(arctan(c*x)*e^(p*log(e*x^2 + d) - 2*p*log(x))/x^5, x) + 1/2*(e^
2*x^4 - d*e*p*x^2 - d^2*(p + 1))*a*e^(p*log(e*x^2 + d) - 2*p*log(x))/((p^2
+ 3*p + 2)*d^2*x^4)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^p}{x^{2\,p+5}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 5),x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 5), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-5-2*p)*(e*x**2+d)**p*(a+b*atan(c*x)),x)
```

```
[Out] Timed out
```

3.1244 $\int x^{-6-2p} \left(d+ex^2\right)^p \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=81

$$b\text{Int}\left(x^{-2p-6}\tan^{-1}(cx)\left(d+ex^2\right)^p,x\right)-\frac{ax^{-2p-5}\left(d+ex^2\right)^{p+1}{}_2F_1\left(-\frac{3}{2},1;\frac{1}{2}(-2p-3);-\frac{ex^2}{d}\right)}{d(2p+5)}$$

```
[Out] -a*x^(-5-2*p)*(e*x^2+d)^(1+p)*hypergeom([-3/2, 1],[-3/2-p],-e*x^2/d)/d/(5+2
*p)+b*Unintegrable(x^(-6-2*p)*(e*x^2+d)^p*arctan(c*x),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^{-6-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Int[x^(-6 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -((a*x^(-5 - 2*p)*(d + e*x^2)^p*Hypergeometric2F1[(-5 - 2*p)/2, -p, (-3 - 2
*p)/2, -((e*x^2)/d)])/((5 + 2*p)*(1 + (e*x^2)/d)^p)) + b*Defer[Int][x^(-6 -
 2*p)*(d + e*x^2)^p*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^{-6-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx &= a\int x^{-6-2p}\left(d+ex^2\right)^p\,dx+b\int x^{-6-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx\\ &= b\int x^{-6-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx+\left(a\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}\right)\int x^-\\ &= -\frac{ax^{-5-2p}\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}{}_2F_1\left(\frac{1}{2}(-5-2p),-p;\frac{1}{2}(-3-2p);-\frac{ex^2}{d}\right.}{5+2p}\end{aligned}$$

Mathematica [A] time = 4.16, size = 0, normalized size = 0.00

$$\int x^{-6-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^(-6 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^(-6 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-6-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 6), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-6-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 6), x)
```

maple [A] time = 1.50, size = 0, normalized size = 0.00

$$\int x^{-6-2p} \left(e\,x^{2}+d\right)^{p} \left(a+b\arctan\left(cx\right)\right)dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-6-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
[Out] int(x^(-6-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\arctan\left(cx\right)+a)\left(ex^{2}+d\right)^{p}x^{-2\,p-6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-6-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 6), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,{\left(e\,x^2+d\right)}^p}{x^{2\,p+6}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 6),x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 6), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-6-2*p)*(e*x**2+d)**p*(a+b*atan(c*x)),x)
[Out] Timed out
```

3.1245 $\int x^{-7-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)\,dx$

Optimal. Leaf size=466

$$-\frac{e^2x^{-2(p+1)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{d^3(p+1)(p+2)(p+3)}+\frac{ex^{-2(p+2)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{d^2(p+2)(p+3)}-\frac{x^{-2(p+3)}\left(d+ex^2\right)^{p+1}\left(a+b\,\mathrm{t}\right.}{2d(p+3)}$$

```
[Out] -1/2*b*(2*e^2+2*c^2*d*e*(1+p)+c^4*d^2*(p^2+3*p+2))*x^(-5-2*p)*(e*x^2+d)^p*A
ppellF1(-5/2-p,1,-1-p,-3/2-p,-c^2*x^2,-e*x^2/d)/c^3/d^2/(3+p)/(5+2*p)/(p^2+
3*p+2)/((1+e*x^2/d)^p)-e^2*(e*x^2+d)^(1+p)*(a+b*arctan(c*x))/d^3/(2+p)/(p^2
+4*p+3)/(x^(2+2*p))+e*(e*x^2+d)^(1+p)*(a+b*arctan(c*x))/d^2/(2+p)/(3+p)/(x^
(4+2*p))-1/2*(e*x^2+d)^(1+p)*(a+b*arctan(c*x))/d/(3+p)/(x^(6+2*p))+b*e*(e+c
^2*d*(1+p))*x^(-5-2*p)*(e*x^2+d)^p*hypergeom([-1-p, -5/2-p],[-3/2-p],-e*x^2
/d)/c^3/d^2/(3+p)/(5+2*p)/(p^2+3*p+2)/((1+e*x^2/d)^p)-b*e^2*x^(-3-2*p)*(e*x
^2+d)^p*hypergeom([-1-p, -3/2-p],[-1/2-p],-e*x^2/d)/c/d^2/(p^2+3*p+2)/(2*p^
2+9*p+9)/((1+e*x^2/d)^p)
```

Rubi [A] time = 1.43, antiderivative size = 466, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 25, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.360, Rules used = {271, 264, 4976, 12, 6725, 365, 364, 511, 510}

$$-\frac{e^2x^{-2(p+1)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{d^3(p+1)(p+2)(p+3)}+\frac{ex^{-2(p+2)}\left(d+ex^2\right)^{p+1}\left(a+b\tan^{-1}(cx)\right)}{d^2(p+2)(p+3)}-\frac{x^{-2(p+3)}\left(d+ex^2\right)^{p+1}\left(a+b\,\mathrm{t}\right.}{2d(p+3)}$$

Antiderivative was successfully verified.

```
[In] Int[x^(-7 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -(b*(2*e^2 + 2*c^2*d*e*(1 + p) + c^4*d^2*(2 + 3*p + p^2))*x^(-5 - 2*p)*(d +
 e*x^2)^p*AppellF1[(-5 - 2*p)/2, 1, -1 - p, (-3 - 2*p)/2, -(c^2*x^2), -((e*
x^2)/d)])/(2*c^3*d^2*(1 + p)*(2 + p)*(3 + p)*(5 + 2*p)*(1 + (e*x^2)/d)^p) -
 (e^2*(d + e*x^2)^(1 + p)*(a + b*ArcTan[c*x]))/(d^3*(1 + p)*(2 + p)*(3 + p)
*x^(2*(1 + p))) + (e*(d + e*x^2)^(1 + p)*(a + b*ArcTan[c*x]))/(d^2*(2 + p)*
(3 + p)*x^(2*(2 + p))) - ((d + e*x^2)^(1 + p)*(a + b*ArcTan[c*x]))/(2*d*(3
+ p)*x^(2*(3 + p))) + (b*e*(e + c^2*d*(1 + p))*x^(-5 - 2*p)*(d + e*x^2)^p*H
ypergeometric2F1[(-5 - 2*p)/2, -1 - p, (-3 - 2*p)/2, -((e*x^2)/d)])/(c^3*d^
2*(1 + p)*(2 + p)*(3 + p)*(5 + 2*p)*(1 + (e*x^2)/d)^p) - (b*e^2*x^(-3 - 2*p
)*(d + e*x^2)^p*Hypergeometric2F1[(-3 - 2*p)/2, -1 - p, (-1 - 2*p)/2, -((e*
x^2)/d)])/(c*d^2*(1 + p)*(2 + p)*(3 + p)*(3 + 2*p)*(1 + (e*x^2)/d)^p)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 264

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c
*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] /; FreeQ[{a, b, c, m, n,
 p}, x] && EqQ[(m + 1)/n + p + 1, 0] && NeQ[m, -1]
```

Rule 271

```
Int[(x_)^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(x^(m + 1)*(
a + b*x^n)^(p + 1))/(a*(m + 1)), x] - Dist[(b*(m + n*(p + 1) + 1))/(a*(m +
1)), Int[x^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, m, n, p}, x] && IL
tQ[Simplify[(m + 1)/n + p + 1], 0] && NeQ[m, -1]
```

Rule 364

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(a^
p*(c*x)^(m + 1)*Hypergeometric2F1[-p, (m + 1)/n, (m + 1)/n + 1, -((b*x^n)/a
)])/(c*(m + 1)), x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0] && (ILt
Q[p, 0] || GtQ[a, 0])
```

Rule 365

```
Int[((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[(a^
IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x^n)/a)^FracPart[p], Int[(c*x)^
m*(1 + (b*x^n)/a)^p, x], x] /; FreeQ[{a, b, c, m, n, p}, x] && !IGtQ[p, 0]
 && !(ILtQ[p, 0] || GtQ[a, 0])
```

Rule 510

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Simp[(a^p*c^q*(e*x)^(m + 1)*AppellF1[(m + 1)/n, -p, -
q, 1 + (m + 1)/n, -((b*x^n)/a), -((d*x^n)/c)])/(e*(m + 1)), x] /; FreeQ[{a,
 b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] && NeQ[m, n
 - 1] && (IntegerQ[p] || GtQ[a, 0]) && (IntegerQ[q] || GtQ[c, 0])
```

Rule 511

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_)*((c_) + (d_.)*(x_)^(n_
))^(q_), x_Symbol] :> Dist[(a^IntPart[p]*(a + b*x^n)^FracPart[p])/(1 + (b*x
^n)/a)^FracPart[p], Int[(e*x)^m*(1 + (b*x^n)/a)^p*(c + d*x^n)^q, x], x] /;
FreeQ[{a, b, c, d, e, m, n, p, q}, x] && NeQ[b*c - a*d, 0] && NeQ[m, -1] &&
 NeQ[m, n - 1] && !(IntegerQ[p] || GtQ[a, 0])
```

Rule 4976

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((f_.)*(x_))^(m_.)*((d_.) + (e_.)*(x
_)^2)^(q_.), x_Symbol] :> With[{u = IntHide[(f*x)^m*(d + e*x^2)^q, x]}, Dis
t[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[SimplifyIntegrand[u/(1 + c^2*x^2
), x], x], x]] /; FreeQ[{a, b, c, d, e, f, m, q}, x] && ((IGtQ[q, 0] && !(
ILtQ[(m - 1)/2, 0] && GtQ[m + 2*q + 3, 0])) || (IGtQ[(m + 1)/2, 0] && !(IL
tQ[q, 0] && GtQ[m + 2*q + 3, 0])) || (ILtQ[(m + 2*q + 1)/2, 0] && !ILtQ[(m
 - 1)/2, 0]))
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int x^{-7-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx=-\frac{e^2x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{d^3(1+p)(2+p)(3+p)}+\frac{ex^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a\right.}{d^2(2+p)(3+}$$

$$=-\frac{e^2x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{d^3(1+p)(2+p)(3+p)}+\frac{ex^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a\right.}{d^2(2+p)(3+}$$

$$=-\frac{e^2x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{d^3(1+p)(2+p)(3+p)}+\frac{ex^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a\right.}{d^2(2+p)(3+}$$

$$=-\frac{e^2x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{d^3(1+p)(2+p)(3+p)}+\frac{ex^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a\right.}{d^2(2+p)(3+}$$

$$=-\frac{e^2x^{-2(1+p)}\left(d+ex^2\right)^{1+p}\left(a+b\tan^{-1}(cx)\right)}{d^3(1+p)(2+p)(3+p)}+\frac{ex^{-2(2+p)}\left(d+ex^2\right)^{1+p}\left(a\right.}{d^2(2+p)(3+}$$

$$=-\frac{b\left(2e^2+2c^2de(1+p)+c^4d^2\left(2+3p+p^2\right)\right)x^{-5-2p}\left(d+ex^2\right)^p\left(1+\frac{ex}{d}\right.}{2c^3d^2(1+p)(2+p)(3+}$$

Mathematica [F] time = 5.32, size = 0, normalized size = 0.00

$$\int x^{-7-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^(-7 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
[Out] Integrate[x^(-7 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]), x]
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\mathrm{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^px^{-2p-7},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-7-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 7), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(b\arctan(cx)+a)\left(ex^2+d\right)^px^{-2p-7}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-7-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 7), x)
```

maple [F] time = 1.46, size = 0, normalized size = 0.00

$$\int x^{-7-2p}\left(ex^2+d\right)^p(a+b\arctan(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-7-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

```
[Out] int(x^(-7-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$b\int \frac{\arctan(cx)e^{\left(p\log\left(ex^2+d\right)-2\,p\log(x)\right)}}{x^7}\,dx-\frac{\left(2\,e^3x^6-2\,de^2px^4+\left(p^2+p\right)d^2ex^2+\left(p^2+3\,p+2\right)d^3\right)ae^{\left(p\log\left(ex^2+d\right)-\right.}}{2\left(p^3+6\,p^2+11\,p+6\right)d^3x^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-7-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
```

```
[Out] b*integrate(arctan(c*x)*e^(p*log(e*x^2 + d) - 2*p*log(x))/x^7, x) - 1/2*(2*
e^3*x^6 - 2*d*e^2*p*x^4 + (p^2 + p)*d^2*e*x^2 + (p^2 + 3*p + 2)*d^3)*a*e^(p
*log(e*x^2 + d) - 2*p*log(x))/((p^3 + 6*p^2 + 11*p + 6)*d^3*x^6)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))\,\left(e\,x^2+d\right)^p}{x^{2\,p+7}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 7),x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 7), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-7-2*p)*(e*x**2+d)**p*(a+b*atan(c*x)),x)
```

```
[Out] Timed out
```

3.1246 $\int x^{-8-2p} \left(d+ex^2\right)^p \left(a+b\tan^{-1}(cx)\right) dx$

Optimal. Leaf size=81

$$b\text{Int}\left(x^{-2p-8}\tan^{-1}(cx)\left(d+ex^2\right)^p,x\right)-\frac{ax^{-2p-7}\left(d+ex^2\right)^{p+1}\,_2F_1\left(-\frac{5}{2},1;\frac{1}{2}(-2p-5);-\frac{ex^2}{d}\right)}{d(2p+7)}$$

```
[Out] -a*x^(-7-2*p)*(e*x^2+d)^(1+p)*hypergeom([-5/2, 1],[-5/2-p],-e*x^2/d)/d/(7+2
*p)+b*Unintegrable(x^(-8-2*p)*(e*x^2+d)^p*arctan(c*x),x)
```

Rubi [A] time = 0.14, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int x^{-8-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Int[x^(-8 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] -((a*x^(-7 - 2*p)*(d + e*x^2)^p*Hypergeometric2F1[(-7 - 2*p)/2, -p, (-5 - 2
*p)/2, -((e*x^2)/d)])/((7 + 2*p)*(1 + (e*x^2)/d)^p)) + b*Defer[Int][x^(-8 -
 2*p)*(d + e*x^2)^p*ArcTan[c*x], x]
```

Rubi steps

$$\begin{aligned}\int x^{-8-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx &= a\int x^{-8-2p}\left(d+ex^2\right)^p\,dx+b\int x^{-8-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx\\ &= b\int x^{-8-2p}\left(d+ex^2\right)^p\tan^{-1}(cx)\,dx+\left(a\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}\right)\int x^-\\ &= -\frac{ax^{-7-2p}\left(d+ex^2\right)^p\left(1+\frac{ex^2}{d}\right)^{-p}\,_2F_1\left(\frac{1}{2}(-7-2p),-p;\frac{1}{2}(-5-2p);-\frac{ex^2}{d}\right.}{7+2p}\end{aligned}$$

Mathematica [A] time = 3.22, size = 0, normalized size = 0.00

$$\int x^{-8-2p}\left(d+ex^2\right)^p\left(a+b\tan^{-1}(cx)\right)dx$$

Verification is Not applicable to the result.

```
[In] Integrate[x^(-8 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]),x]
```

```
[Out] Integrate[x^(-8 - 2*p)*(d + e*x^2)^p*(a + b*ArcTan[c*x]), x]
```

fricas [A] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left((b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-8},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-8-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="fricas")
```

```
[Out] integral((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 8), x)
```

giac [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-8-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="giac")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 8), x)
```

maple [A] time = 1.44, size = 0, normalized size = 0.00

$$\int x^{-8-2p} \left(e\,x^2+d\right)^p (a+b\arctan(cx))\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^(-8-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
[Out] int(x^(-8-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$\int (b\arctan(cx)+a)\left(ex^2+d\right)^p x^{-2p-8}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^(-8-2*p)*(e*x^2+d)^p*(a+b*arctan(c*x)),x, algorithm="maxima")
[Out] integrate((b*arctan(c*x) + a)*(e*x^2 + d)^p*x^(-2*p - 8), x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))\,\left(e\,x^2+d\right)^p}{x^{2\,p+8}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 8),x)
[Out] int(((a + b*atan(c*x))*(d + e*x^2)^p)/x^(2*p + 8), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**(-8-2*p)*(e*x**2+d)**p*(a+b*atan(c*x)),x)
[Out] Timed out
```

3.1247 $\int x^3 \left(d+ex^2\right) \left(a+b\tan^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=271

$$\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{6c^6}-\frac{abex}{3c^5}-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{4c^4}+\frac{abdx}{2c^3}+\frac{bex^3\left(a+b\tan^{-1}(cx)\right)}{9c^3}+\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{bdx^3\left(\right.}{}$$

```
[Out] 1/2*a*b*d*x/c^3-1/3*a*b*e*x/c^5+1/12*b^2*d*x^2/c^2-4/45*b^2*e*x^2/c^4+1/60*
b^2*e*x^4/c^2+1/2*b^2*d*x*arctan(c*x)/c^3-1/3*b^2*e*x*arctan(c*x)/c^5-1/6*b
*d*x^3*(a+b*arctan(c*x))/c+1/9*b*e*x^3*(a+b*arctan(c*x))/c^3-1/15*b*e*x^5*(
a+b*arctan(c*x))/c-1/4*d*(a+b*arctan(c*x))^2/c^4+1/6*e*(a+b*arctan(c*x))^2/
c^6+1/4*d*x^4*(a+b*arctan(c*x))^2+1/6*e*x^6*(a+b*arctan(c*x))^2-1/3*b^2*d*l
n(c^2*x^2+1)/c^4+23/90*b^2*e*ln(c^2*x^2+1)/c^6
```

Rubi [A] time = 0.65, antiderivative size = 271, normalized size of antiderivative = 1.00, number of steps used = 29, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4980, 4852, 4916, 266, 43, 4846, 260, 4884}

$$\frac{abdx}{2c^3}-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{4c^4}+\frac{bex^3\left(a+b\tan^{-1}(cx)\right)}{9c^3}-\frac{abex}{3c^5}+\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{6c^6}+\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{bdx^3\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (a*b*d*x)/(2*c^3) - (a*b*e*x)/(3*c^5) + (b^2*d*x^2)/(12*c^2) - (4*b^2*e*x^2
)/(45*c^4) + (b^2*e*x^4)/(60*c^2) + (b^2*d*x*ArcTan[c*x])/(2*c^3) - (b^2*e*
x*ArcTan[c*x])/(3*c^5) - (b*d*x^3*(a + b*ArcTan[c*x]))/(6*c) + (b*e*x^3*(a
+ b*ArcTan[c*x]))/(9*c^3) - (b*e*x^5*(a + b*ArcTan[c*x]))/(15*c) - (d*(a +
b*ArcTan[c*x])^2)/(4*c^4) + (e*(a + b*ArcTan[c*x])^2)/(6*c^6) + (d*x^4*(a +
 b*ArcTan[c*x])^2)/4 + (e*x^6*(a + b*ArcTan[c*x])^2)/6 - (b^2*d*Log[1 + c^2
*x^2])/(3*c^4) + (23*b^2*e*Log[1 + c^2*x^2])/(90*c^6)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int x^3\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(dx^3\left(a+b\tan^{-1}(cx)\right)^2+ex^5\left(a+b\tan^{-1}(cx)\right)^2\right)dx$$

$$=d\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx+e\int x^5\left(a+b\tan^{-1}(cx)\right)^2\,dx$$

$$=\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{6}ex^6\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{2}(bcd)\int\frac{x^4\left(a+\right.}{1}$$

$$=\frac{1}{4}dx^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{6}ex^6\left(a+b\tan^{-1}(cx)\right)^2-\frac{(bd)\int x^2\left(a+b\,\mathrm{ta}\right.}{2c}$$

$$=-\frac{bdx^3\left(a+b\tan^{-1}(cx)\right)}{6c}-\frac{bex^5\left(a+b\tan^{-1}(cx)\right)}{15c}+\frac{1}{4}dx^4\left(a+b\tan^{-1}\right.$$

$$=\frac{abdx}{2c^3}-\frac{bdx^3\left(a+b\tan^{-1}(cx)\right)}{6c}+\frac{bex^3\left(a+b\tan^{-1}(cx)\right)}{9c^3}-\frac{bex^5\left(a+b\right.}{15}$$

$$=\frac{abdx}{2c^3}-\frac{abex}{3c^5}+\frac{b^2dx\tan^{-1}(cx)}{2c^3}-\frac{bdx^3\left(a+b\tan^{-1}(cx)\right)}{6c}+\frac{bex^3\left(a+b\right.}{9c}$$

$$=\frac{abdx}{2c^3}-\frac{abex}{3c^5}+\frac{b^2dx^2}{12c^2}-\frac{b^2ex^2}{30c^4}+\frac{b^2ex^4}{60c^2}+\frac{b^2dx\tan^{-1}(cx)}{2c^3}-\frac{b^2ex\tan^{-1}}{3c^5}$$

$$=\frac{abdx}{2c^3}-\frac{abex}{3c^5}+\frac{b^2dx^2}{12c^2}-\frac{4b^2ex^2}{45c^4}+\frac{b^2ex^4}{60c^2}+\frac{b^2dx\tan^{-1}(cx)}{2c^3}-\frac{b^2ex\tan^{-1}}{3c^5}$$

Mathematica [A] time = 0.27, size = 240, normalized size = 0.89

$$cx\left(15a^2c^5x^3\left(3d+2ex^2\right)-2ab\left(3c^4\left(5dx^2+2ex^4\right)-5c^2\left(9d+2ex^2\right)+30e\right)+b^2cx\left(3c^2\left(5d+ex^2\right)-16e\right)\right)+2$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (c*x*(15*a^2*c^5*x^3*(3*d + 2*e*x^2) + b^2*c*x*(-16*e + 3*c^2*(5*d + e*x^2)
) - 2*a*b*(30*e - 5*c^2*(9*d + 2*e*x^2) + 3*c^4*(5*d*x^2 + 2*e*x^4))) + 2*b
*(b*c*x*(-30*e + 5*c^2*(9*d + 2*e*x^2) - 3*c^4*(5*d*x^2 + 2*e*x^4)) + 15*a*
(-3*c^2*d + 2*e + c^6*(3*d*x^4 + 2*e*x^6)))*ArcTan[c*x] + 15*b^2*(-3*c^2*d
+ 2*e + c^6*(3*d*x^4 + 2*e*x^6))*ArcTan[c*x]^2 + 2*b^2*(-30*c^2*d + 23*e)*L
og[1 + c^2*x^2])/(180*c^6)
```

fricas [A] time = 0.48, size = 289, normalized size = 1.07

$$\frac{30\,a^2c^6ex^6 - 12\,abc^5ex^5 + 3\left(15\,a^2c^6d + b^2c^4e\right)x^4 - 10\left(3\,abc^5d - 2\,abc^3e\right)x^3 + \left(15\,b^2c^4d - 16\,b^2c^2e\right)x^2 + 15\left(2\,b^2c^6 \cdots\right.}{\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/180*(30*a^2*c^6*e*x^6 - 12*a*b*c^5*e*x^5 + 3*(15*a^2*c^6*d + b^2*c^4*e)*x
^4 - 10*(3*a*b*c^5*d - 2*a*b*c^3*e)*x^3 + (15*b^2*c^4*d - 16*b^2*c^2*e)*x^2
 + 15*(2*b^2*c^6*e*x^6 + 3*b^2*c^6*d*x^4 - 3*b^2*c^2*d + 2*b^2*e)*arctan(c*
x)^2 + 30*(3*a*b*c^3*d - 2*a*b*c*e)*x + 2*(30*a*b*c^6*e*x^6 + 45*a*b*c^6*d*
x^4 - 6*b^2*c^5*e*x^5 - 45*a*b*c^2*d - 5*(3*b^2*c^5*d - 2*b^2*c^3*e)*x^3 +
30*a*b*e + 15*(3*b^2*c^3*d - 2*b^2*c*e)*x)*arctan(c*x) - 2*(30*b^2*c^2*d -
23*b^2*e)*log(c^2*x^2 + 1))/c^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 329, normalized size = 1.21

$$\frac{b^2\arctan\left(cx\right)^2 e\,x^6}{6}+\frac{b^2\arctan\left(cx\right)^2 e}{6c^6}-\frac{b^2\arctan\left(cx\right)^2 d}{4c^4}+\frac{b^2\arctan\left(cx\right)^2 x^4 d}{4}-\frac{abd\,x^3}{6c}-\frac{4b^2e\,x^2}{45c^4}+\frac{b^2e\,x^4}{60c^2}+\frac{abdx}{2c^3}+\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/6*b^2*arctan(c*x)^2*e*x^6+1/6/c^6*b^2*arctan(c*x)^2*e-1/4/c^4*b^2*arctan(
c*x)^2*d+1/4*b^2*arctan(c*x)^2*x^4*d-1/6/c*a*b*d*x^3-4/45*b^2*e*x^2/c^4+1/6
0*b^2*e*x^4/c^2+1/2*a*b*d*x/c^3+1/2*b^2*d*x*arctan(c*x)/c^3+1/12*b^2*d*x^2/
c^2-1/3*b^2*d*ln(c^2*x^2+1)/c^4+23/90*b^2*e*ln(c^2*x^2+1)/c^6-1/3*a*b*e*x/c
^5-1/3*b^2*e*x*arctan(c*x)/c^5+1/3*a*b*arctan(c*x)*e*x^6+1/2*a*b*arctan(c*x
)*x^4*d+1/9/c^3*b^2*arctan(c*x)*x^3*e-1/15/c*a*b*e*x^5+1/9/c^3*a*b*x^3*e-1/
6/c*b^2*arctan(c*x)*d*x^3-1/15/c*b^2*arctan(c*x)*e*x^5-1/2/c^4*a*b*arctan(c
*x)*d+1/3/c^6*a*b*arctan(c*x)*e+1/6*a^2*e*x^6+1/4*a^2*x^4*d
```

maxima [A] time = 0.44, size = 306, normalized size = 1.13

$$\frac{1}{6}\,b^2ex^6\arctan\left(cx\right)^2+\frac{1}{6}\,a^2ex^6+\frac{1}{4}\,b^2dx^4\arctan\left(cx\right)^2+\frac{1}{4}\,a^2dx^4+\frac{1}{6}\left(3\,x^4\arctan\left(cx\right)-c\left(\frac{c^2x^3-3\,x}{c^4}+\frac{3\,\arctan\left(cx\right)}{c^5}\cdots\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/6*b^2*e*x^6*arctan(c*x)^2 + 1/6*a^2*e*x^6 + 1/4*b^2*d*x^4*arctan(c*x)^2 +
 1/4*a^2*d*x^4 + 1/6*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan
(c*x)/c^5))*a*b*d - 1/12*(2*c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)*arc
tan(c*x) - (c^2*x^2 + 3*arctan(c*x)^2 - 4*log(c^2*x^2 + 1))/c^4)*b^2*d + 1/
45*(15*x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(
c*x)/c^7))*a*b*e - 1/180*(4*c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arct
an(c*x)/c^7)*arctan(c*x) - (3*c^4*x^4 - 16*c^2*x^2 - 30*arctan(c*x)^2 + 46*
log(c^2*x^2 + 1))/c^6)*b^2*e
```

mupad [B] time = 1.56, size = 338, normalized size = 1.25

$$\frac{46\,b^2\,e\,\ln\left(c^2\,x^2+1\right)+30\,b^2\,e\,\mathrm{atan}\left(c\,x\right)^2-60\,b^2\,c^2\,d\,\ln\left(c^2\,x^2+1\right)+45\,a^2\,c^6\,d\,x^4+15\,b^2\,c^4\,d\,x^2+30\,a^2\,c^6\,e\,x^6}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))^2*(d + e*x^2),x)
```

```
[Out] (46*b^2*e*log(c^2*x^2 + 1) + 30*b^2*e*atan(c*x)^2 - 60*b^2*c^2*d*log(c^2*x^
2 + 1) + 45*a^2*c^6*d*x^4 + 15*b^2*c^4*d*x^2 + 30*a^2*c^6*e*x^6 - 16*b^2*c^
2*e*x^2 + 3*b^2*c^4*e*x^4 + 60*a*b*e*atan(c*x) - 45*b^2*c^2*d*atan(c*x)^2 +
 45*b^2*c^6*d*x^4*atan(c*x)^2 + 30*b^2*c^6*e*x^6*atan(c*x)^2 - 30*a*b*c^5*d
*x^3 + 20*a*b*c^3*e*x^3 - 12*a*b*c^5*e*x^5 + 90*b^2*c^3*d*x*atan(c*x) - 60*
a*b*c*e*x - 30*b^2*c^5*d*x^3*atan(c*x) + 20*b^2*c^3*e*x^3*atan(c*x) - 12*b^
2*c^5*e*x^5*atan(c*x) + 90*a*b*c^3*d*x - 90*a*b*c^2*d*atan(c*x) - 60*b^2*c*
e*x*atan(c*x) + 90*a*b*c^6*d*x^4*atan(c*x) + 60*a*b*c^6*e*x^6*atan(c*x))/(1
80*c^6)
```

sympy [A] time = 3.69, size = 398, normalized size = 1.47

$$\begin{cases} \frac{a^2dx^4}{4} + \frac{a^2ex^6}{6} + \frac{abdx^4\,\mathrm{atan}\,(cx)}{2} + \frac{abex^6\,\mathrm{atan}\,(cx)}{3} - \frac{abdx^3}{6c} - \frac{abex^5}{15c} + \frac{abdx}{2c^3} + \frac{abex^3}{9c^3} - \frac{abd\,\mathrm{atan}\,(cx)}{2c^4} - \frac{abex}{3c^5} + \frac{abe\,\mathrm{atan}\,(cx)}{3c^6} + \frac{b^2dx}{} \\ a^2\left(\frac{dx^4}{4} + \frac{ex^6}{6}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)*(a+b*atan(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*x**4/4 + a**2*e*x**6/6 + a*b*d*x**4*atan(c*x)/2 + a*b*e*x
**6*atan(c*x)/3 - a*b*d*x**3/(6*c) - a*b*e*x**5/(15*c) + a*b*d*x/(2*c**3) +
 a*b*e*x**3/(9*c**3) - a*b*d*atan(c*x)/(2*c**4) - a*b*e*x/(3*c**5) + a*b*e*
atan(c*x)/(3*c**6) + b**2*d*x**4*atan(c*x)**2/4 + b**2*e*x**6*atan(c*x)**2/
6 - b**2*d*x**3*atan(c*x)/(6*c) - b**2*e*x**5*atan(c*x)/(15*c) + b**2*d*x**
2/(12*c**2) + b**2*e*x**4/(60*c**2) + b**2*d*x*atan(c*x)/(2*c**3) + b**2*e*
x**3*atan(c*x)/(9*c**3) - b**2*d*log(x**2 + c**(-2))/(3*c**4) - b**2*d*atan
(c*x)**2/(4*c**4) - 4*b**2*e*x**2/(45*c**4) - b**2*e*x*atan(c*x)/(3*c**5) +
 23*b**2*e*log(x**2 + c**(-2))/(90*c**6) + b**2*e*atan(c*x)**2/(6*c**6), Ne
(c, 0)), (a**2*(d*x**4/4 + e*x**6/6), True))
```

3.1248 $\int x^2 \left(d+ex^2\right) \left(a+b\tan^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=323

$$\frac{ie\left(a+b\tan^{-1}(cx)\right)^2}{5c^5}+\frac{2be\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{5c^5}-\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}-\frac{2bd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^3}+$$

```
[Out] 1/3*b^2*d*x/c^2-3/10*b^2*e*x/c^4+1/30*b^2*e*x^3/c^2-1/3*b^2*d*arctan(c*x)/c
^3+3/10*b^2*e*arctan(c*x)/c^5-1/3*b*d*x^2*(a+b*arctan(c*x))/c+1/5*b*e*x^2*(
a+b*arctan(c*x))/c^3-1/10*b*e*x^4*(a+b*arctan(c*x))/c-1/3*I*d*(a+b*arctan(c
*x))^2/c^3+1/5*I*e*(a+b*arctan(c*x))^2/c^5+1/3*d*x^3*(a+b*arctan(c*x))^2+1/
5*e*x^5*(a+b*arctan(c*x))^2-2/3*b*d*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3+2
/5*b*e*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^5-1/3*I*b^2*d*polylog(2,1-2/(1+I
*c*x))/c^3+1/5*I*b^2*e*polylog(2,1-2/(1+I*c*x))/c^5
```

Rubi [A] time = 0.59, antiderivative size = 323, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4980, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 302}

$$-\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^3}+\frac{ib^2e\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{5c^5}-\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}-\frac{2bd\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (b^2*d*x)/(3*c^2) - (3*b^2*e*x)/(10*c^4) + (b^2*e*x^3)/(30*c^2) - (b^2*d*Ar
cTan[c*x])/(3*c^3) + (3*b^2*e*ArcTan[c*x])/(10*c^5) - (b*d*x^2*(a + b*ArcTa
n[c*x]))/(3*c) + (b*e*x^2*(a + b*ArcTan[c*x]))/(5*c^3) - (b*e*x^4*(a + b*Ar
cTan[c*x]))/(10*c) - ((I/3)*d*(a + b*ArcTan[c*x])^2)/c^3 + ((I/5)*e*(a + b*
ArcTan[c*x])^2)/c^5 + (d*x^3*(a + b*ArcTan[c*x])^2)/3 + (e*x^5*(a + b*ArcTa
n[c*x])^2)/5 - (2*b*d*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(3*c^3) + (2*
b*e*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(5*c^5) - ((I/3)*b^2*d*PolyLog[
2, 1 - 2/(1 + I*c*x)])/c^3 + ((I/5)*b^2*e*PolyLog[2, 1 - 2/(1 + I*c*x)])/c^
5
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int x^2\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(dx^2\left(a+b\tan^{-1}(cx)\right)^2+ex^4\left(a+b\tan^{-1}(cx)\right)^2\right)dx$$

$$=d\int x^2\left(a+b\tan^{-1}(cx)\right)^2\,dx+e\int x^4\left(a+b\tan^{-1}(cx)\right)^2\,dx$$

$$=\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{5}ex^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{1}{3}(2bcd)\int\frac{x^3\left(a+b\right.}{1+}$$

$$=\frac{1}{3}dx^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{5}ex^5\left(a+b\tan^{-1}(cx)\right)^2-\frac{(2bd)\int x\left(a+b\tan\right.}{3c}$$

$$=-\frac{bdx^2\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{bex^4\left(a+b\tan^{-1}(cx)\right)}{10c}-\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}$$

$$=\frac{b^2dx}{3c^2}-\frac{bdx^2\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{bex^2\left(a+b\tan^{-1}(cx)\right)}{5c^3}-\frac{bex^4\left(a+b\tan\right.}{10c}$$

$$=\frac{b^2dx}{3c^2}-\frac{3b^2ex}{10c^4}+\frac{b^2ex^3}{30c^2}-\frac{b^2d\tan^{-1}(cx)}{3c^3}-\frac{bdx^2\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{bex^2\left(\right.}{}$$

$$=\frac{b^2dx}{3c^2}-\frac{3b^2ex}{10c^4}+\frac{b^2ex^3}{30c^2}-\frac{b^2d\tan^{-1}(cx)}{3c^3}+\frac{3b^2e\tan^{-1}(cx)}{10c^5}-\frac{bdx^2\left(a+b\,\mathrm{ta}\right.}{3c}$$

$$=\frac{b^2dx}{3c^2}-\frac{3b^2ex}{10c^4}+\frac{b^2ex^3}{30c^2}-\frac{b^2d\tan^{-1}(cx)}{3c^3}+\frac{3b^2e\tan^{-1}(cx)}{10c^5}-\frac{bdx^2\left(a+b\,\mathrm{ta}\right.}{3c}$$

Mathematica [A] time = 0.93, size = 287, normalized size = 0.89

$$\frac{10a^2c^5dx^3+6a^2c^5ex^5-10abc^4dx^2-3abc^4ex^4+10abc^2d\log\left(c^2x^2+1\right)+6abc^2ex^2-6abe\log\left(c^2x^2+1\right)-b\tan}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (9*a*b*e + 10*b^2*c^3*d*x - 9*b^2*c*e*x - 10*a*b*c^4*d*x^2 + 6*a*b*c^2*e*x^
2 + 10*a^2*c^5*d*x^3 + b^2*c^3*e*x^3 - 3*a*b*c^4*e*x^4 + 6*a^2*c^5*e*x^5 +
2*b^2*((5*I)*c^2*d - (3*I)*e + c^5*(5*d*x^3 + 3*e*x^5))*ArcTan[c*x]^2 - b*A
rcTan[c*x]*(-4*a*c^5*x^3*(5*d + 3*e*x^2) + b*(1 + c^2*x^2)*(-9*e + c^2*(10*
d + 3*e*x^2)) + 4*b*(5*c^2*d - 3*e)*Log[1 + E^((2*I)*ArcTan[c*x])]) + 10*a*
b*c^2*d*Log[1 + c^2*x^2] - 6*a*b*e*Log[1 + c^2*x^2] + (2*I)*b^2*(5*c^2*d -
3*e)*PolyLog[2, -E^((2*I)*ArcTan[c*x])])/(30*c^5)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(a^2ex^4+a^2dx^2+\left(b^2ex^4+b^2dx^2\right)\arctan\left(cx\right)^2+2\left(abex^4+abdx^2\right)\arctan\left(cx\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(a^2*e*x^4 + a^2*d*x^2 + (b^2*e*x^4 + b^2*d*x^2)*arctan(c*x)^2 + 2*
(a*b*e*x^4 + a*b*d*x^2)*arctan(c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.17, size = 667, normalized size = 2.07

$$\frac{a^2 e\, x^5}{5}+\frac{a^2 d\, x^3}{3}-\frac{i b^2 \operatorname{dilog}\left(-\frac{i(cx+i)}{2}\right) d}{6c^3}+\frac{i b^2 \operatorname{dilog}\left(\frac{i(cx-i)}{2}\right) d}{6c^3}-\frac{i b^2 \ln\left(cx-i\right)^2 d}{12c^3}+\frac{i b^2 \ln\left(cx+i\right)^2 d}{12c^3}-\frac{i b^2 \ln\left(cx+i\right)^2}{20c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/5*a^2*e*x^5+1/3*a^2*d*x^3-3/10*b^2*e*x/c^4+1/30*b^2*e*x^3/c^2+3/10*b^2*e*
arctan(c*x)/c^5+1/10*I/c^5*b^2*ln(I+c*x)*ln(c^2*x^2+1)*e-1/10*I/c^5*b^2*ln(
I+c*x)*ln(1/2*I*(c*x-I))*e+1/3*b^2*d*x/c^2+1/6*I/c^3*b^2*ln(I+c*x)*ln(1/2*I
*(c*x-I))*d-1/3*b^2*d*arctan(c*x)/c^3-1/6*I/c^3*b^2*ln(I+c*x)*ln(c^2*x^2+1)
*d-1/6*I/c^3*b^2*ln(-1/2*I*(I+c*x))*ln(c*x-I)*d-1/10*I/c^5*b^2*ln(c^2*x^2+1
)*ln(c*x-I)*e+1/6*I/c^3*b^2*ln(c^2*x^2+1)*ln(c*x-I)*d+1/10*I/c^5*b^2*ln(-1/
2*I*(I+c*x))*ln(c*x-I)*e-1/10/c*b^2*arctan(c*x)*e*x^4+1/3*b^2*arctan(c*x)^2
*d*x^3+1/5*b^2*arctan(c*x)^2*e*x^5+1/3/c^3*b^2*arctan(c*x)*ln(c^2*x^2+1)*d+
1/5/c^3*b^2*arctan(c*x)*x^2*e+1/3/c^3*a*b*ln(c^2*x^2+1)*d-1/5/c^5*b^2*arcta
n(c*x)*ln(c^2*x^2+1)*e-1/5/c^5*a*b*ln(c^2*x^2+1)*e-1/10/c*a*b*e*x^4+1/5/c^3
*a*b*x^2*e-1/3/c*a*b*d*x^2+1/10*I/c^5*b^2*dilog(-1/2*I*(I+c*x))*e-1/10*I/c^
5*b^2*dilog(1/2*I*(c*x-I))*e+2/3*a*b*arctan(c*x)*d*x^3+2/5*a*b*arctan(c*x)*
e*x^5-1/3/c*b^2*arctan(c*x)*d*x^2-1/6*I/c^3*b^2*dilog(-1/2*I*(I+c*x))*d-1/1
2*I/c^3*b^2*ln(c*x-I)^2*d+1/12*I/c^3*b^2*ln(I+c*x)^2*d+1/6*I/c^3*b^2*dilog(
1/2*I*(c*x-I))*d-1/20*I/c^5*b^2*ln(I+c*x)^2*e+1/20*I/c^5*b^2*ln(c*x-I)^2*e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{5}a^2ex^5+\frac{1}{3}a^2dx^3+\frac{1}{3}\left(2x^3\arctan\left(cx\right)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)abd+\frac{1}{10}\left(4x^5\arctan\left(cx\right)-c\left(\frac{c^2x^4-2x^2}{c^4}+\frac{2}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*a^2*e*x^5 + 1/3*a^2*d*x^3 + 1/3*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c
^2*x^2 + 1)/c^4))*a*b*d + 1/10*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^
4 + 2*log(c^2*x^2 + 1)/c^6))*a*b*e + 1/60*(3*b^2*e*x^5 + 5*b^2*d*x^3)*arcta
n(c*x)^2 - 1/240*(3*b^2*e*x^5 + 5*b^2*d*x^3)*log(c^2*x^2 + 1)^2 + integrate
(1/240*(180*(b^2*c^2*e*x^6 + b^2*d*x^2 + (b^2*c^2*d + b^2*e)*x^4)*arctan(c*
x)^2 + 15*(b^2*c^2*e*x^6 + b^2*d*x^2 + (b^2*c^2*d + b^2*e)*x^4)*log(c^2*x^2
 + 1)^2 - 8*(3*b^2*c*e*x^5 + 5*b^2*c*d*x^3)*arctan(c*x) + 4*(3*b^2*c^2*e*x^
6 + 5*b^2*c^2*d*x^4)*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2\,\left(e\,x^2+d\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))^2*(d + e*x^2),x)
```

```
[Out] int(x^2*(a + b*atan(c*x))^2*(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2} \left(a + b \operatorname{atan}{\left(c x \right)}\right)^{2} \left(d + e x^{2}\right)\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)*(a+b*atan(c*x))**2,x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))**2*(d + e*x**2), x)
```

3.1249 $\int x\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=199

$$-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{4c^4}+\frac{abex}{2c^3}+\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{abdx}{c}+\frac{1}{4}ex^4\left(a+b\tan^{-1}(cx)\right)^2-$$

```
[Out] -a*b*d*x/c+1/2*a*b*e*x/c^3+1/12*b^2*e*x^2/c^2-b^2*d*x*arctan(c*x)/c+1/2*b^2
*e*x*arctan(c*x)/c^3-1/6*b*e*x^3*(a+b*arctan(c*x))/c+1/2*d*(a+b*arctan(c*x)
)^2/c^2-1/4*e*(a+b*arctan(c*x))^2/c^4+1/2*d*x^2*(a+b*arctan(c*x))^2+1/4*e*x
^4*(a+b*arctan(c*x))^2+1/2*b^2*d*ln(c^2*x^2+1)/c^2-1/3*b^2*e*ln(c^2*x^2+1)/
c^4
```

Rubi [A] time = 0.40, antiderivative size = 199, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 8, integrand size = 19, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.421, Rules used = {4980, 4852, 4916, 4846, 260, 4884, 266, 43}

$$\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2c^2}+\frac{abex}{2c^3}-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{4c^4}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{abdx}{c}+\frac{1}{4}ex^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{be}{}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] -((a*b*d*x)/c) + (a*b*e*x)/(2*c^3) + (b^2*e*x^2)/(12*c^2) - (b^2*d*x*ArcTan
[c*x])/c + (b^2*e*x*ArcTan[c*x])/(2*c^3) - (b*e*x^3*(a + b*ArcTan[c*x]))/(6
*c) + (d*(a + b*ArcTan[c*x])^2)/(2*c^2) - (e*(a + b*ArcTan[c*x])^2)/(4*c^4)
 + (d*x^2*(a + b*ArcTan[c*x])^2)/2 + (e*x^4*(a + b*ArcTan[c*x])^2)/4 + (b^2
*d*Log[1 + c^2*x^2])/(2*c^2) - (b^2*e*Log[1 + c^2*x^2])/(3*c^4)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
```

```
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\begin{aligned}
\int x\left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)^2\,dx &= \int \left(dx\left(a+b\tan^{-1}(cx)\right)^2+ex^3\left(a+b\tan^{-1}(cx)\right)^2\right)dx\\
&= d\int x\left(a+b\tan^{-1}(cx)\right)^2\,dx+e\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx\\
&= \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{4}ex^4\left(a+b\tan^{-1}(cx)\right)^2-(bcd)\int\frac{x^2\left(a+b\tan\right.}{1+c^2x}\\
&= \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{4}ex^4\left(a+b\tan^{-1}(cx)\right)^2-\frac{(bd)\int\left(a+b\tan^{-1}(c\right.}{c}\\
&= -\frac{abdx}{c}-\frac{bex^3\left(a+b\tan^{-1}(cx)\right)}{6c}+\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-}\right.\\
&= -\frac{abdx}{c}+\frac{abex}{2c^3}-\frac{b^2dx\tan^{-1}(cx)}{c}-\frac{bex^3\left(a+b\tan^{-1}(cx)\right)}{6c}+\frac{d\left(a+b\tan^{-1}\right.}{2c^2}\\
&= -\frac{abdx}{c}+\frac{abex}{2c^3}-\frac{b^2dx\tan^{-1}(cx)}{c}+\frac{b^2ex\tan^{-1}(cx)}{2c^3}-\frac{bex^3\left(a+b\tan^{-1}(cx)\right)}{6c}\\
&= -\frac{abdx}{c}+\frac{abex}{2c^3}+\frac{b^2ex^2}{12c^2}-\frac{b^2dx\tan^{-1}(cx)}{c}+\frac{b^2ex\tan^{-1}(cx)}{2c^3}-\frac{bex^3\left(a+b\,t\right.}{6c}
\end{aligned}$$

Mathematica [A] time = 0.19, size = 179, normalized size = 0.90

$$\frac{cx\left(3a^2c^3x\left(2d+ex^2\right)-2abc^2\left(6d+ex^2\right)+6abe+b^2cex\right)+2b\tan^{-1}(cx)\left(3ac^4\left(2dx^2+ex^4\right)+6ac^2d-3ae-bc^3x\right.}{12c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (c*x*(6*a*b*e + b^2*c*e*x + 3*a^2*c^3*x*(2*d + e*x^2) - 2*a*b*c^2*(6*d + e*
x^2)) + 2*b*(6*a*c^2*d - 3*a*e + 3*b*c*e*x - b*c^3*x*(6*d + e*x^2) + 3*a*c^
4*(2*d*x^2 + e*x^4))*ArcTan[c*x] + 3*b^2*(2*c^2*d - e + c^4*(2*d*x^2 + e*x^
4))*ArcTan[c*x]^2 + 2*b^2*(3*c^2*d - 2*e)*Log[1 + c^2*x^2])/(12*c^4)
```

fricas [A] time = 0.47, size = 218, normalized size = 1.10

$$\frac{3\,a^2c^4ex^4 - 2\,abc^3ex^3 + \left(6\,a^2c^4d + b^2c^2e\right)x^2 + 3\left(b^2c^4ex^4 + 2\,b^2c^4dx^2 + 2\,b^2c^2d - b^2e\right)\arctan(cx)^2 - 6\left(2\,abc^3d\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/12*(3*a^2*c^4*e*x^4 - 2*a*b*c^3*e*x^3 + (6*a^2*c^4*d + b^2*c^2*e)*x^2 + 3
*(b^2*c^4*e*x^4 + 2*b^2*c^4*d*x^2 + 2*b^2*c^2*d - b^2*e)*arctan(c*x)^2 - 6*
(2*a*b*c^3*d - a*b*c*e)*x + 2*(3*a*b*c^4*e*x^4 + 6*a*b*c^4*d*x^2 - b^2*c^3*
e*x^3 + 6*a*b*c^2*d - 3*a*b*e - 3*(2*b^2*c^3*d - b^2*c*e)*x)*arctan(c*x) +
2*(3*b^2*c^2*d - 2*b^2*e)*log(c^2*x^2 + 1))/c^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.05, size = 249, normalized size = 1.25

$$\frac{a^2e\,x^4}{4}+\frac{a^2x^2d}{2}+\frac{b^2\arctan(cx)^2\,e\,x^4}{4}+\frac{b^2\arctan(cx)^2\,d\,x^2}{2}-\frac{b^2\arctan(cx)\,x^3e}{6c}-\frac{b^2dx\arctan(cx)}{c}+\frac{b^2ex\arctan(c}{2c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/4*a^2*e*x^4+1/2*a^2*x^2*d+1/4*b^2*arctan(c*x)^2*e*x^4+1/2*b^2*arctan(c*x)
^2*d*x^2-1/6/c*b^2*arctan(c*x)*x^3*e-b^2*d*x*arctan(c*x)/c+1/2*b^2*e*x*arct
an(c*x)/c^3+1/2/c^2*b^2*arctan(c*x)^2*d-1/4/c^4*b^2*arctan(c*x)^2*e+1/12*b^
2*e*x^2/c^2+1/2*b^2*d*ln(c^2*x^2+1)/c^2-1/3*b^2*e*ln(c^2*x^2+1)/c^4+1/2*a*b
*arctan(c*x)*e*x^4+a*b*arctan(c*x)*d*x^2-1/6/c*a*b*x^3*e-a*b*d*x/c+1/2*a*b*
e*x/c^3+1/c^2*a*b*arctan(c*x)*d-1/2/c^4*a*b*arctan(c*x)*e
```

maxima [A] time = 0.44, size = 247, normalized size = 1.24

$$\frac{1}{4}\,b^2ex^4\arctan(cx)^2+\frac{1}{4}\,a^2ex^4+\frac{1}{2}\,b^2dx^2\arctan(cx)^2+\frac{1}{2}\,a^2dx^2+\left(x^2\arctan(cx)-c\left(\frac{x}{c^2}-\frac{\arctan(cx)}{c^3}\right)\right)abd-\frac{1}{2}\left(\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/4*b^2*e*x^4*arctan(c*x)^2 + 1/4*a^2*e*x^4 + 1/2*b^2*d*x^2*arctan(c*x)^2 +
 1/2*a^2*d*x^2 + (x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a*b*d - 1/
2*(2*c*(x/c^2 - arctan(c*x)/c^3)*arctan(c*x) + (arctan(c*x)^2 - log(c^2*x^2
 + 1))/c^2)*b^2*d + 1/6*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arc
tan(c*x)/c^5))*a*b*e - 1/12*(2*c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)*
arctan(c*x) - (c^2*x^2 + 3*arctan(c*x)^2 - 4*log(c^2*x^2 + 1))/c^4)*b^2*e
```

mupad [B] time = 1.00, size = 248, normalized size = 1.25

$$\frac{a^2\,d\,x^2}{2}+\frac{a^2\,e\,x^4}{4}+\frac{b^2\,d\,\ln\left(c^2\,x^2+1\right)}{2\,c^2}-\frac{b^2\,e\,\ln\left(c^2\,x^2+1\right)}{3\,c^4}+\frac{b^2\,e\,x^2}{12\,c^2}+\frac{b^2\,d\,\mathrm{atan}\left(c\,x\right)^2}{2\,c^2}-\frac{b^2\,e\,\mathrm{atan}\left(c\,x\right)^2}{4\,c^4}+\frac{b^2\,d\,x^2\,\mathrm{atan}\left(c\right.}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))^2*(d + e*x^2),x)
```

```
[Out] (a^2*d*x^2)/2 + (a^2*e*x^4)/4 + (b^2*d*log(c^2*x^2 + 1))/(2*c^2) - (b^2*e*l
og(c^2*x^2 + 1))/(3*c^4) + (b^2*e*x^2)/(12*c^2) + (b^2*d*atan(c*x)^2)/(2*c^
2) - (b^2*e*atan(c*x)^2)/(4*c^4) + (b^2*d*x^2*atan(c*x)^2)/2 + (b^2*e*x^4*a
tan(c*x)^2)/4 - (a*b*e*x^3)/(6*c) - (b^2*d*x*atan(c*x))/c + (b^2*e*x*atan(c
*x))/(2*c^3) - (b^2*e*x^3*atan(c*x))/(6*c) - (a*b*d*x)/c + (a*b*e*x)/(2*c^3
) + (a*b*d*atan(c*x))/c^2 - (a*b*e*atan(c*x))/(2*c^4) + a*b*d*x^2*atan(c*x)
 + (a*b*e*x^4*atan(c*x))/2
```

sympy [A] time = 2.18, size = 296, normalized size = 1.49

$$\begin{cases} \frac{a^2dx^2}{2}+\frac{a^2ex^4}{4}+abdx^2\,\mathrm{atan}\,(cx)+\frac{abex^4\,\mathrm{atan}\,(cx)}{2}-\frac{abdx}{c}-\frac{abex^3}{6c}+\frac{abd\,\mathrm{atan}\,(cx)}{c^2}+\frac{abex}{2c^3}-\frac{abe\,\mathrm{atan}\,(cx)}{2c^4}+\frac{b^2dx^2\,\mathrm{atan}^2\,(cx)}{2}+\frac{b^2e}{} \\ a^2\left(\frac{dx^2}{2}+\frac{ex^4}{4}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)*(a+b*atan(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d*x**2/2 + a**2*e*x**4/4 + a*b*d*x**2*atan(c*x) + a*b*e*x**
4*atan(c*x)/2 - a*b*d*x/c - a*b*e*x**3/(6*c) + a*b*d*atan(c*x)/c**2 + a*b*e
*x/(2*c**3) - a*b*e*atan(c*x)/(2*c**4) + b**2*d*x**2*atan(c*x)**2/2 + b**2*
e*x**4*atan(c*x)**2/4 - b**2*d*x*atan(c*x)/c - b**2*e*x**3*atan(c*x)/(6*c)
+ b**2*d*log(x**2 + c**(-2))/(2*c**2) + b**2*d*atan(c*x)**2/(2*c**2) + b**2
*e*x**2/(12*c**2) + b**2*e*x*atan(c*x)/(2*c**3) - b**2*e*log(x**2 + c**(-2)
)/(3*c**4) - b**2*e*atan(c*x)**2/(4*c**4), Ne(c, 0)), (a**2*(d*x**2/2 + e*x
**4/4), True))
```

3.1250 $\int \left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=231

$$-\frac{ie\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}-\frac{2be\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^3}+dx\left(a+b\tan^{-1}(cx)\right)^2+\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{c}+\frac{2bd\log\ldots}{\ldots}$$

```
[Out] 1/3*b^2*e*x/c^2-1/3*b^2*e*arctan(c*x)/c^3-1/3*b*e*x^2*(a+b*arctan(c*x))/c+I
*d*(a+b*arctan(c*x))^2/c-1/3*I*e*(a+b*arctan(c*x))^2/c^3+d*x*(a+b*arctan(c*
x))^2+1/3*e*x^3*(a+b*arctan(c*x))^2+2*b*d*(a+b*arctan(c*x))*ln(2/(1+I*c*x))
/c-2/3*b*e*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3+I*b^2*d*polylog(2,1-2/(1+I
*c*x))/c-1/3*I*b^2*e*polylog(2,1-2/(1+I*c*x))/c^3
```

Rubi [A] time = 0.36, antiderivative size = 231, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 10, integrand size = 18, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.556, Rules used = {4914, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 321, 203}

$$-\frac{ib^2e\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^3}+\frac{ib^2d\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c}-\frac{ie\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}-\frac{2be\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(c\ldots\right)}{3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (b^2*e*x)/(3*c^2) - (b^2*e*ArcTan[c*x])/(3*c^3) - (b*e*x^2*(a + b*ArcTan[c*
x]))/(3*c) + (I*d*(a + b*ArcTan[c*x])^2)/c - ((I/3)*e*(a + b*ArcTan[c*x])^2
)/c^3 + d*x*(a + b*ArcTan[c*x])^2 + (e*x^3*(a + b*ArcTan[c*x])^2)/3 + (2*b*
d*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c - (2*b*e*(a + b*ArcTan[c*x])*Lo
g[2/(1 + I*c*x)])/(3*c^3) + (I*b^2*d*PolyLog[2, 1 - 2/(1 + I*c*x)])/c - ((I
/3)*b^2*e*PolyLog[2, 1 - 2/(1 + I*c*x)])/c^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)\left(a+b\tan^{-1}(cx)\right)^2\,dx = \int \left(d\left(a+b\tan^{-1}(cx)\right)^2+ex^2\left(a+b\tan^{-1}(cx)\right)^2\right)dx$$

$$= d\int \left(a+b\tan^{-1}(cx)\right)^2 dx + e\int x^2\left(a+b\tan^{-1}(cx)\right)^2 dx$$

$$= dx\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)^2-(2bcd)\int \frac{x\left(a+b\tan^{-1}\right.}{1+c^2x^2}$$

$$= \frac{id\left(a+b\tan^{-1}(cx)\right)^2}{c}+dx\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{3}ex^3\left(a+b\tan^{-1}(cx)\right)^2+$$

$$= -\frac{bex^2\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{c}-\frac{ie\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}+$$

$$= \frac{b^2ex}{3c^2}-\frac{bex^2\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{c}-\frac{ie\left(a+b\tan^{-1}(c\right.}{3c^3}$$

$$= \frac{b^2ex}{3c^2}-\frac{b^2e\tan^{-1}(cx)}{3c^3}-\frac{bex^2\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{c}-$$

$$= \frac{b^2ex}{3c^2}-\frac{b^2e\tan^{-1}(cx)}{3c^3}-\frac{bex^2\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{id\left(a+b\tan^{-1}(cx)\right)^2}{c}-$$

Mathematica [A] time = 0.48, size = 208, normalized size = 0.90

$$\frac{3a^2c^3dx+a^2c^3ex^3-3abc^2d\log\left(c^2x^2+1\right)-abc^2ex^2+abe\log\left(c^2x^2+1\right)-b\tan^{-1}(cx)\left(-2ac^3x\left(3d+ex^2\right)+2\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (3*a^2*c^3*d*x + b^2*c*e*x - a*b*c^2*e*x^2 + a^2*c^3*e*x^3 + b^2*((-3*I)*c^
2*d + I*e + c^3*(3*d*x + e*x^3))*ArcTan[c*x]^2 - b*ArcTan[c*x]*(-2*a*c^3*x*
(3*d + e*x^2) + b*(e + c^2*e*x^2) + 2*b*(-3*c^2*d + e)*Log[1 + E^((2*I)*Arc
Tan[c*x])]) - 3*a*b*c^2*d*Log[1 + c^2*x^2] + a*b*e*Log[1 + c^2*x^2] - I*b^2
*(3*c^2*d - e)*PolyLog[2, -E^((2*I)*ArcTan[c*x])])/(3*c^3)
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(a^2ex^2+a^2d+\left(b^2ex^2+b^2d\right)\arctan\left(cx\right)^2+2\left(abex^2+abd\right)\arctan\left(cx\right),x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arctan(c*x)^2 + 2*(a*b*e*x
^2 + a*b*d)*arctan(c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.13, size = 570, normalized size = 2.47

$$a^2dx-\frac{ib^2\ln(cx-i)^2e}{12c^3}-\frac{b^2e\arctan(cx)}{3c^3}+\frac{ib^2\ln\left(c^2x^2+1\right)\ln(cx-i)e}{6c^3}+\frac{ib^2\ln(cx-i)\ln\left(-\frac{i(cx+i)}{2}\right)d}{2c}-\frac{ib^2\ln(cx+i)}{2c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))^2,x)
```

```
[Out] a^2*d*x-1/6*I/c^3*b^2*ln(c^2*x^2+1)*ln(I+c*x)*e+1/6*I/c^3*b^2*ln(I+c*x)*ln(
1/2*I*(c*x-I))*e-1/6*I/c^3*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))*e-1/3*b^2*e*arc
tan(c*x)/c^3+1/3*b^2*e*x/c^2-1/2*I/c*b^2*dilog(1/2*I*(c*x-I))*d+b^2*arctan(
c*x)^2*d*x+1/3*b^2*arctan(c*x)^2*x^3*e+1/2*I/c*b^2*dilog(-1/2*I*(I+c*x))*d+
1/2*I/c*b^2*ln(c^2*x^2+1)*ln(I+c*x)*d-1/2*I/c*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I
))*d-1/2*I/c*b^2*ln(c^2*x^2+1)*ln(c*x-I)*d+1/6*I/c^3*b^2*ln(c^2*x^2+1)*ln(c
*x-I)*e+1/2*I/c*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))*d-1/4*I/c*b^2*ln(I+c*x)^2*
d+1/4*I/c*b^2*ln(c*x-I)^2*d+1/12*I/c^3*b^2*ln(I+c*x)^2*e+1/6*I/c^3*b^2*dilo
g(1/2*I*(c*x-I))*e-1/6*I/c^3*b^2*dilog(-1/2*I*(I+c*x))*e-1/12*I/c^3*b^2*ln(
c*x-I)^2*e+1/3/c^3*a*b*ln(c^2*x^2+1)*e-1/c*b^2*arctan(c*x)*ln(c^2*x^2+1)*d-
1/3/c*b^2*arctan(c*x)*x^2*e-1/c*a*b*ln(c^2*x^2+1)*d+2*a*b*arctan(c*x)*d*x+2
/3*a*b*arctan(c*x)*x^3*e+1/3/c^3*b^2*arctan(c*x)*ln(c^2*x^2+1)*e-1/3/c*a*b*
x^2*e+1/3*a^2*x^3*e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{3}a^2ex^3+36\,b^2c^2e\int\frac{x^4\arctan(cx)^2}{48\left(c^2x^2+1\right)}\,dx+3\,b^2c^2e\int\frac{x^4\log\left(c^2x^2+1\right)^2}{48\left(c^2x^2+1\right)}\,dx+4\,b^2c^2e\int\frac{x^4\log\left(c^2x^2+1\right)}{48\left(c^2x^2+1\right)}\,dx+36\,b^2c^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/3*a^2*e*x^3 + 36*b^2*c^2*e*integrate(1/48*x^4*arctan(c*x)^2/(c^2*x^2 + 1)
, x) + 3*b^2*c^2*e*integrate(1/48*x^4*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x)
+ 4*b^2*c^2*e*integrate(1/48*x^4*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + 36*b^
2*c^2*d*integrate(1/48*x^2*arctan(c*x)^2/(c^2*x^2 + 1), x) + 3*b^2*c^2*d*in
tegrate(1/48*x^2*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + 12*b^2*c^2*d*integr
ate(1/48*x^2*log(c^2*x^2 + 1)/(c^2*x^2 + 1), x) + 1/4*b^2*d*arctan(c*x)^3/c
 - 8*b^2*c*e*integrate(1/48*x^3*arctan(c*x)/(c^2*x^2 + 1), x) - 24*b^2*c*d*
integrate(1/48*x*arctan(c*x)/(c^2*x^2 + 1), x) + 1/3*(2*x^3*arctan(c*x) - c
*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a*b*e + a^2*d*x + 36*b^2*e*integrate(1/4
8*x^2*arctan(c*x)^2/(c^2*x^2 + 1), x) + 3*b^2*e*integrate(1/48*x^2*log(c^2*
x^2 + 1)^2/(c^2*x^2 + 1), x) + 3*b^2*d*integrate(1/48*log(c^2*x^2 + 1)^2/(c
^2*x^2 + 1), x) + (2*c*x*arctan(c*x) - log(c^2*x^2 + 1))*a*b*d/c + 1/12*(b^
2*e*x^3 + 3*b^2*d*x)*arctan(c*x)^2 - 1/48*(b^2*e*x^3 + 3*b^2*d*x)*log(c^2*x
^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int(a+b\,\mathrm{atan}(c\,x))^2\,\left(e\,x^2+d\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2*(d + e*x^2),x)
```

```
[Out] int((a + b*atan(c*x))^2*(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int(a+b\,\mathrm{atan}(cx))^2\left(d+ex^2\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))**2,x)
```

```
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2), x)
```

3.1251 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))^2}{x}\,dx$

Optimal. Leaf size=217

$$\frac{e(a+b\tan^{-1}(cx))^2}{2c^2} - ibd\text{Li}_2\left(1-\frac{2}{icx+1}\right)(a+b\tan^{-1}(cx)) + ibd\text{Li}_2\left(\frac{2}{icx+1}-1\right)(a+b\tan^{-1}(cx)) + 2d\tanh^{-1}\left(1\right.$$

```
[Out] -a*b*e*x/c-b^2*e*x*arctan(c*x)/c+1/2*e*(a+b*arctan(c*x))^2/c^2+1/2*e*x^2*(a
+b*arctan(c*x))^2-2*d*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))+1/2*b^2*e
*ln(c^2*x^2+1)/c^2-I*b*d*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))+I*b*d*(
a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))-1/2*b^2*d*polylog(3,1-2/(1+I*c*x
))+1/2*b^2*d*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.44, antiderivative size = 217, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}} = 0.476$, Rules used = {4980, 4850, 4988, 4884, 4994, 6610, 4852, 4916, 4846, 260}

$$-ibd\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)(a+b\tan^{-1}(cx)) + ibd\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)(a+b\tan^{-1}(cx)) - \frac{1}{2}b^2d\text{PolyLog}\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] -((a*b*e*x)/c) - (b^2*e*x*ArcTan[c*x])/c + (e*(a + b*ArcTan[c*x])^2)/(2*c^2
) + (e*x^2*(a + b*ArcTan[c*x])^2)/2 + 2*d*(a + b*ArcTan[c*x])^2*ArcTanh[1 -
 2/(1 + I*c*x)] + (b^2*e*Log[1 + c^2*x^2])/(2*c^2) - I*b*d*(a + b*ArcTan[c*
x])*PolyLog[2, 1 - 2/(1 + I*c*x)] + I*b*d*(a + b*ArcTan[c*x])*PolyLog[2, -1
 + 2/(1 + I*c*x)] - (b^2*d*PolyLog[3, 1 - 2/(1 + I*c*x)])/2 + (b^2*d*PolyLo
g[3, -1 + 2/(1 + I*c*x)])/2
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))^2}{x}\,dx = \int \left(\frac{d(a+b\tan^{-1}(cx))^2}{x} + ex(a+b\tan^{-1}(cx))^2\right)dx$$

$$= d\int \frac{(a+b\tan^{-1}(cx))^2}{x}\,dx + e\int x(a+b\tan^{-1}(cx))^2\,dx$$

$$= \frac{1}{2}ex^2(a+b\tan^{-1}(cx))^2 + 2d(a+b\tan^{-1}(cx))^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right) - (4bc$$

$$= \frac{1}{2}ex^2(a+b\tan^{-1}(cx))^2 + 2d(a+b\tan^{-1}(cx))^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right) + (2bc$$

$$= -\frac{abex}{c} + \frac{e(a+b\tan^{-1}(cx))^2}{2c^2} + \frac{1}{2}ex^2(a+b\tan^{-1}(cx))^2 + 2d(a+b\tan^{-1}(c$$

$$= -\frac{abex}{c} - \frac{b^2ex\tan^{-1}(cx)}{c} + \frac{e(a+b\tan^{-1}(cx))^2}{2c^2} + \frac{1}{2}ex^2(a+b\tan^{-1}(cx))^2 +$$

$$= -\frac{abex}{c} - \frac{b^2ex\tan^{-1}(cx)}{c} + \frac{e(a+b\tan^{-1}(cx))^2}{2c^2} + \frac{1}{2}ex^2(a+b\tan^{-1}(cx))^2 +$$

Mathematica [A] time = 0.39, size = 263, normalized size = 1.21

$$a^2d\log(x)+\frac{1}{2}a^2ex^2+\frac{abe((c^2x^2+1)\tan^{-1}(cx)-cx)}{c^2}+iabd(\text{Li}_2(-icx)-\text{Li}_2(icx))+\frac{b^2e(\log(c^2x^2+1)+(c^2x^2+1)\text{t}}{2c^2}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] (a^2*e*x^2)/2 + (a*b*e*(-(c*x) + (1 + c^2*x^2)*ArcTan[c*x]))/c^2 + a^2*d*Lo
g[x] + (b^2*e*(-2*c*x*ArcTan[c*x] + (1 + c^2*x^2)*ArcTan[c*x]^2 + Log[1 + c
^2*x^2]))/(2*c^2) + I*a*b*d*(PolyLog[2, (-I)*c*x] - PolyLog[2, I*c*x]) + b^
2*d*((-1/24*I)*Pi^3 + ((2*I)/3)*ArcTan[c*x]^3 + ArcTan[c*x]^2*Log[1 - E^((-
2*I)*ArcTan[c*x])] - ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] + I*ArcTa
n[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + I*ArcTan[c*x]*PolyLog[2, -E^((2
*I)*ArcTan[c*x])] + PolyLog[3, E^((-2*I)*ArcTan[c*x])]/2 - PolyLog[3, -E^((
2*I)*ArcTan[c*x])]/2)
```

fricas [F] time = 0.41, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2ex^2 + a^2d + (b^2ex^2 + b^2d)\arctan(cx)^2 + 2(abex^2 + abd)\arctan(cx)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arctan(c*x)^2 + 2*(a*b*e*
x^2 + a*b*d)*arctan(c*x))/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 4.14, size = 1284, normalized size = 5.92

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))^2/x,x)
```

```
[Out] a*b/c^2*arctan(c*x)*e+1/2*b^2/c^2*arctan(c*x)^2*e+1/2*b^2*arctan(c*x)^2*x^2
*e+b^2*arctan(c*x)^2*d*ln(c*x)-b^2/c^2*e*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-b^2*
d*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)+b^2*d*arctan(c*x)^2*ln(1+(1+I
*c*x)/(c^2*x^2+1)^(1/2))+b^2*d*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/
2))+1/2*I*b^2*d*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1
)+1))^3*arctan(c*x)^2+1/2*I*b^2*d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2-1/2*I*b^2*d*Pi*csgn(((1+I*c*x)^2/
(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+I*a*b*d*ln(c*x)
*ln(1+I*c*x)-1/2*I*b^2*d*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+
I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*
b^2*d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1
)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2*d*Pi*csgn(I*((1
+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^
2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-1/2*I*b^2*d*Pi*csgn(
I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^
2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+a*b*arctan(c*
x)*x^2*e+2*a*b*arctan(c*x)*d*ln(c*x)+1/2*I*b^2*d*Pi*csgn(I*((1+I*c*x)^2/(c^
2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x
^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2+a^2*d*ln(c*x)+2*b^2*d*p
olylog(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*b^2*d*polylog(3,(1+I*c*x)/(c^2*x^2
+1)^(1/2))-1/2*b^2*d*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+I*a*b*d*dilog(1+I*
c*x)+1/2*I*b^2*d*Pi*arctan(c*x)^2+I*b^2*d*arctan(c*x)*polylog(2,-(1+I*c*x)^
2/(c^2*x^2+1))+I*b^2/c^2*arctan(c*x)*e-2*I*b^2*d*arctan(c*x)*polylog(2,(1+I
*c*x)/(c^2*x^2+1)^(1/2))-2*I*b^2*d*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^
2+1)^(1/2))-I*a*b*d*dilog(1-I*c*x)-I*a*b*d*ln(c*x)*ln(1-I*c*x)-a*b*e*x/c-b^
2*e*x*arctan(c*x)/c+1/2*a^2*x^2*e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{8}\,b^2ex^2\arctan\left(cx\right)^2-\frac{1}{32}\,b^2ex^2\log\left(c^2x^2+1\right)^2+12\,b^2c^2e\int\frac{x^4\arctan\left(cx\right)^2}{16\left(c^2x^3+x\right)}\,dx+b^2c^2e\int\frac{x^4\log\left(c^2x^2+1\right)^2}{16\left(c^2x^3+x\right)}\,dx+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] 1/8*b^2*e*x^2*arctan(c*x)^2 - 1/32*b^2*e*x^2*log(c^2*x^2 + 1)^2 + 12*b^2*c^
2*e*integrate(1/16*x^4*arctan(c*x)^2/(c^2*x^3 + x), x) + b^2*c^2*e*integrat
e(1/16*x^4*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 32*a*b*c^2*e*integrate(1/
16*x^4*arctan(c*x)/(c^2*x^3 + x), x) + 2*b^2*c^2*e*integrate(1/16*x^4*log(c
^2*x^2 + 1)/(c^2*x^3 + x), x) + 12*b^2*c^2*d*integrate(1/16*x^2*arctan(c*x)
^2/(c^2*x^3 + x), x) + 32*a*b*c^2*d*integrate(1/16*x^2*arctan(c*x)/(c^2*x^3
 + x), x) + 1/96*b^2*d*log(c^2*x^2 + 1)^3 + 1/2*a^2*e*x^2 - 4*b^2*c*e*integ
rate(1/16*x^3*arctan(c*x)/(c^2*x^3 + x), x) + 12*b^2*e*integrate(1/16*x^2*a
rctan(c*x)^2/(c^2*x^3 + x), x) + 32*a*b*e*integrate(1/16*x^2*arctan(c*x)/(c
^2*x^3 + x), x) + 12*b^2*d*integrate(1/16*arctan(c*x)^2/(c^2*x^3 + x), x) +
 b^2*d*integrate(1/16*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 32*a*b*d*integ
rate(1/16*arctan(c*x)/(c^2*x^3 + x), x) + 1/96*b^2*e*log(c^2*x^2 + 1)^3/c^2
 + a^2*d*log(x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2\,\left(e\,x^2 + d\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + e*x^2))/x,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + e*x^2))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))^2\,\left(d + ex^2\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))**2/x,x)
```

```
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2)/x, x)
```

3.1252 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=172

$$-icd\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x}+2bcd\log\left(2-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)+\frac{ie\left(a+b\tan^{-1}(cx)\right)^2}{c}+$$

```
[Out] -I*c*d*(a+b*arctan(c*x))^2+I*e*(a+b*arctan(c*x))^2/c-d*(a+b*arctan(c*x))^2/
x+e*x*(a+b*arctan(c*x))^2+2*b*e*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c+2*b*c*d
*(a+b*arctan(c*x))*ln(2-2/(1-I*c*x))-I*b^2*c*d*polylog(2,-1+2/(1-I*c*x))+I*
b^2*e*polylog(2,1-2/(1+I*c*x))/c
```

Rubi [A] time = 0.33, antiderivative size = 172, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4980, 4846, 4920, 4854, 2402, 2315, 4852, 4924, 4868, 2447}

$$-ib^2cd\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)+\frac{ib^2e\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c}-icd\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x}+2b$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] (-I)*c*d*(a + b*ArcTan[c*x])^2 + (I*e*(a + b*ArcTan[c*x])^2)/c - (d*(a + b*
ArcTan[c*x])^2)/x + e*x*(a + b*ArcTan[c*x])^2 + (2*b*e*(a + b*ArcTan[c*x])*
Log[2/(1 + I*c*x)])/c + 2*b*c*d*(a + b*ArcTan[c*x])*Log[2 - 2/(1 - I*c*x)]
- I*b^2*c*d*PolyLog[2, -1 + 2/(1 - I*c*x)] + (I*b^2*e*PolyLog[2, 1 - 2/(1 +
 I*c*x)])/c
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
```

```
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))^2}{x^2}\,dx = \int \left(e(a+b\tan^{-1}(cx))^2 + \frac{d(a+b\tan^{-1}(cx))^2}{x^2}\right)dx$$
$$= d\int \frac{(a+b\tan^{-1}(cx))^2}{x^2}\,dx + e\int (a+b\tan^{-1}(cx))^2\,dx$$
$$= -\frac{d(a+b\tan^{-1}(cx))^2}{x} + ex(a+b\tan^{-1}(cx))^2 + (2bcd)\int \frac{a+b\tan^{-1}(cx}{x(1+c^2x^2)}$$
$$= -icd(a+b\tan^{-1}(cx))^2 + \frac{ie(a+b\tan^{-1}(cx))^2}{c} - \frac{d(a+b\tan^{-1}(cx))^2}{x} + e$$
$$= -icd(a+b\tan^{-1}(cx))^2 + \frac{ie(a+b\tan^{-1}(cx))^2}{c} - \frac{d(a+b\tan^{-1}(cx))^2}{x} + e$$
$$= -icd(a+b\tan^{-1}(cx))^2 + \frac{ie(a+b\tan^{-1}(cx))^2}{c} - \frac{d(a+b\tan^{-1}(cx))^2}{x} + e$$
$$= -icd(a+b\tan^{-1}(cx))^2 + \frac{ie(a+b\tan^{-1}(cx))^2}{c} - \frac{d(a+b\tan^{-1}(cx))^2}{x} + e$$

Mathematica [A] time = 0.30, size = 204, normalized size = 1.19

$$\frac{-a^2cd + a^2cex^2 + abcd\left(cx\left(2\log(cx) - \log\left(c^2x^2+1\right)\right) - 2\tan^{-1}(cx)\right) + abex\left(2cx\tan^{-1}(cx) - \log\left(c^2x^2+1\right)\right)}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] (-(a^2*c*d) + a^2*c*e*x^2 + a*b*c*d*(-2*ArcTan[c*x] + c*x*(2*Log[c*x] - Log
[1 + c^2*x^2])) + a*b*e*x*(2*c*x*ArcTan[c*x] - Log[1 + c^2*x^2]) + b^2*e*x*
(ArcTan[c*x]*((-I + c*x)*ArcTan[c*x] + 2*Log[1 + E^((2*I)*ArcTan[c*x])]) -
I*PolyLog[2, -E^((2*I)*ArcTan[c*x])]) - b^2*c*d*(ArcTan[c*x]^2 - 2*c*x*ArcT
an[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + I*c*x*(ArcTan[c*x]^2 + PolyLog[2,
E^((2*I)*ArcTan[c*x])])))/(c*x)
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2ex^2 + a^2d + (b^2ex^2 + b^2d)\arctan(cx)^2 + 2(abex^2 + abd)\arctan(cx)}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arctan(c*x)^2 + 2*(a*b*e*
x^2 + a*b*d)*arctan(c*x))/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x^2,x, algorithm="giac")
```

[Out] Timed out

maple [B] time = 0.14, size = 597, normalized size = 3.47

$$a^2ex-\frac{a^2d}{x}-icb^2d\ln(cx)\ln(-icx+1)+\frac{icb^2\ln(cx-i)\ln\left(-\frac{i(cx+i)}{2}\right)d}{2}+\frac{icb^2\ln\left(c^2x^2+1\right)\ln(cx+i)d}{2}-\frac{icb^2\ln(cx+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))^2/x^2,x)
```

```
[Out] a^2*e*x-a^2*d/x-b^2*arctan(c*x)^2*d/x+b^2*arctan(c*x)^2*e*x+1/2*I*b^2/c*ln(
c^2*x^2+1)*ln(I+c*x)*e-1/2*I*b^2/c*ln(c^2*x^2+1)*ln(c*x-I)*e+1/2*I*b^2/c*ln
(c*x-I)*ln(-1/2*I*(I+c*x))*e+I*c*b^2*d*ln(c*x)*ln(1+I*c*x)-1/2*I*c*b^2*ln(c
^2*x^2+1)*ln(c*x-I)*d-1/2*I*b^2/c*ln(I+c*x)*ln(1/2*I*(c*x-I))*e-I*c*b^2*d*l
n(c*x)*ln(1-I*c*x)+1/2*I*c*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))*d+1/2*I*c*b^2*l
n(c^2*x^2+1)*ln(I+c*x)*d-1/2*I*c*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))*d+2*c*a*b*
d*ln(c*x)-c*a*b*ln(c^2*x^2+1)*d+2*c*b^2*arctan(c*x)*d*ln(c*x)-c*b^2*arctan(
c*x)*ln(c^2*x^2+1)*d-1/2*I*b^2/c*dilog(1/2*I*(c*x-I))*e+1/2*I*c*b^2*dilog(-
1/2*I*(I+c*x))*d+1/4*I*c*b^2*ln(c*x-I)^2*d-1/4*I*c*b^2*ln(I+c*x)^2*d-I*c*b^
2*d*dilog(1-I*c*x)-1/2*I*c*b^2*dilog(1/2*I*(c*x-I))*d+1/4*I*b^2/c*ln(c*x-I)
^2*e+1/2*I*b^2/c*dilog(-1/2*I*(I+c*x))*e-1/4*I*b^2/c*ln(I+c*x)^2*e+I*c*b^2*
d*dilog(1+I*c*x)-b^2/c*arctan(c*x)*ln(c^2*x^2+1)*e-a*b/c*ln(c^2*x^2+1)*e+2*
a*b*arctan(c*x)*e*x-2*a*b*arctan(c*x)*d/x
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}\left(c\,x\right))^2\,\left(e\,x^2+d\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + e*x^2))/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + e*x^2))/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(cx))^2\left(d+ex^2\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))**2/x**2,x)
```

```
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2)/x**2, x)
```

3.1253 $\int \frac{(d+ex^2)(a+b\tan^{-1}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=220

$$-\frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x}-ibe\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)+$$

```
[Out] -b*c*d*(a+b*arctan(c*x))/x-1/2*c^2*d*(a+b*arctan(c*x))^2-1/2*d*(a+b*arctan(
c*x))^2/x^2-2*e*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))+b^2*c^2*d*ln(x)
-1/2*b^2*c^2*d*ln(c^2*x^2+1)-I*b*e*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x
))+I*b*e*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))-1/2*b^2*e*polylog(3,1-
2/(1+I*c*x))+1/2*b^2*e*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.46, antiderivative size = 220, normalized size of antiderivative = 1.00, number of steps used = 16, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {4980, 4852, 4918, 266, 36, 29, 31, 4884, 4850, 4988, 4994, 6610}

$$-ibe\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+ibe\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}b^2e\text{PolyLo}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -((b*c*d*(a + b*ArcTan[c*x]))/x) - (c^2*d*(a + b*ArcTan[c*x])^2)/2 - (d*(a
+ b*ArcTan[c*x])^2)/(2*x^2) + 2*e*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 +
I*c*x)] + b^2*c^2*d*Log[x] - (b^2*c^2*d*Log[1 + c^2*x^2])/2 - I*b*e*(a + b*
ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] + I*b*e*(a + b*ArcTan[c*x])*Poly
Log[2, -1 + 2/(1 + I*c*x)] - (b^2*e*PolyLog[3, 1 - 2/(1 + I*c*x)])/2 + (b^2
*e*PolyLog[3, -1 + 2/(1 + I*c*x)])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
```

```
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{(d+ex^2)\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx = \int \left(\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{x^3}+\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{x}\right)dx$$

$$= d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx + e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2} + 2e\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right) + (bc$$

$$= -\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2} + 2e\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right) + (bc$$

$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2 - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2 - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2 - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

$$= -\frac{bcd\left(a+b\tan^{-1}(cx)\right)}{x} - \frac{1}{2}c^2d\left(a+b\tan^{-1}(cx)\right)^2 - \frac{d\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}$$

Mathematica [A] time = 0.39, size = 273, normalized size = 1.24

$$-\frac{a^2d}{2x^2}+a^2e\log(x)-\frac{abd\left(\tan^{-1}(cx)+cx\left(cx\tan^{-1}(cx)+1\right)\right)}{x^2}+iabe(\mathrm{Li}_2(-icx)-\mathrm{Li}_2(icx))-\frac{b^2d\left(-2c^2x^2\log\left(\frac{cx}{\sqrt{c^2x^2+}}\right.\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -1/2*(a^2*d)/x^2 - (a*b*d*(ArcTan[c*x] + c*x*(1 + c*x*ArcTan[c*x])))/x^2 +
a^2*e*Log[x] - (b^2*d*(2*c*x*ArcTan[c*x] + (1 + c^2*x^2)*ArcTan[c*x]^2 - 2*
c^2*x^2*Log[(c*x)/Sqrt[1 + c^2*x^2]]))/(2*x^2) + I*a*b*e*(PolyLog[2, (-I)*c
*x] - PolyLog[2, I*c*x]) + (b^2*e*((-I)*Pi^3 + (16*I)*ArcTan[c*x]^3 + 24*Ar
cTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 24*ArcTan[c*x]^2*Log[1 + E^((
2*I)*ArcTan[c*x])] + (24*I)*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])]
+ (24*I)*ArcTan[c*x]*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + 12*PolyLog[3, E^(
(-2*I)*ArcTan[c*x])] - 12*PolyLog[3, -E^((2*I)*ArcTan[c*x])]))/24
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{a^2ex^2+a^2d+\left(b^2ex^2+b^2d\right)\arctan(cx)^2+2\left(abex^2+abd\right)\arctan(cx)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*e*x^2 + a^2*d + (b^2*e*x^2 + b^2*d)*arctan(c*x)^2 + 2*(a*b*e*
x^2 + a*b*d)*arctan(c*x))/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 7.81, size = 1313, normalized size = 5.97

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)*(a+b*arctan(c*x))^2/x^3,x)
```

```
[Out] a^2*e*ln(c*x)+2*b^2*e*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*b^2*e*polylo
g(3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*b^2*e*polylog(3,-(1+I*c*x)^2/(c^2*x^2
+1))+I*a*b*e*ln(c*x)*ln(1+I*c*x)-I*a*b*e*ln(c*x)*ln(1-I*c*x)+1/2*I*b^2*arct
an(c*x)^2*e*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1)
)^3+1/2*I*b^2*arctan(c*x)^2*e*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c
*x)^2/(c^2*x^2+1)+1))^3-1/2*I*b^2*e*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2*arctan(c*x)^2*e*Pi*csgn
(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*
((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))-1/2*I*b^2*e*Pi*csg
n(I/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c
*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2*arctan(c*x)^2*e*Pi*csgn(I*(
(1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(
c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))-1/2*I*b^2*e*Pi*csgn(I*((1+I*c*x)
^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2
+1)+1))^2*arctan(c*x)^2-1/2*I*b^2*e*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/(
(1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(
c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*a^2*d/x^2-c*a*b*d/x-c*b^2*d*arctan(c*x)/
x-c^2*a*b*arctan(c*x)*d+I*a*b*e*dilog(1+I*c*x)+2*a*b*arctan(c*x)*e*ln(c*x)+
I*b^2*e*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+1))-a*b*arctan(c*x)*d/x
^2-I*c^2*b^2*d*arctan(c*x)-I*a*b*e*dilog(1-I*c*x)+1/2*I*b^2*arctan(c*x)^2*e
*Pi-2*I*b^2*e*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*b^2*e
*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))+c^2*b^2*d*ln((1+I*c*x)/
(c^2*x^2+1)^(1/2)-1)+c^2*b^2*d*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))-1/2*c^2*b^
2*arctan(c*x)^2*d-1/2*b^2*arctan(c*x)^2*d/x^2-b^2*e*arctan(c*x)^2*ln((1+I*c
*x)^2/(c^2*x^2+1)-1)+b^2*e*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+
b^2*e*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2*arctan(c*x)^2*e*l
n(c*x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\left(\left(c\arctan(cx)+\frac{1}{x}\right)c+\frac{\arctan(cx)}{x^2}\right)abd+a^2e\log(x)-\frac{a^2d}{2x^2}-\frac{12\,b^2d\arctan(cx)^2-3\,b^2d\log\left(c^2x^2+1\right)^2+\left(3\left(c^2\right.\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)*(a+b*arctan(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] -((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*a*b*d + a^2*e*log(x) - 1/2*a^2
*d/x^2 - 1/96*(12*b^2*d*arctan(c*x)^2 - 3*b^2*d*log(c^2*x^2 + 1)^2 - (1152*
b^2*c^2*e*integrate(1/16*x^4*arctan(c*x)^2/(c^2*x^5 + x^3), x) + 3072*a*b*c
^2*e*integrate(1/16*x^4*arctan(c*x)/(c^2*x^5 + x^3), x) + 1152*b^2*c^2*d*in
tegrate(1/16*x^2*arctan(c*x)^2/(c^2*x^5 + x^3), x) + 96*b^2*c^2*d*integrate
(1/16*x^2*log(c^2*x^2 + 1)^2/(c^2*x^5 + x^3), x) - 192*b^2*c^2*d*integrate(
1/16*x^2*log(c^2*x^2 + 1)/(c^2*x^5 + x^3), x) + b^2*e*log(c^2*x^2 + 1)^3 +
384*b^2*c*d*integrate(1/16*x*arctan(c*x)/(c^2*x^5 + x^3), x) + 1152*b^2*e*i
ntegrate(1/16*x^2*arctan(c*x)^2/(c^2*x^5 + x^3), x) + 96*b^2*e*integrate(1/
16*x^2*log(c^2*x^2 + 1)^2/(c^2*x^5 + x^3), x) + 3072*a*b*e*integrate(1/16*x
```

```
^2*arctan(c*x)/(c^2*x^5 + x^3), x) + 1152*b^2*d*integrate(1/16*arctan(c*x)^
2/(c^2*x^5 + x^3), x) + 96*b^2*d*integrate(1/16*log(c^2*x^2 + 1)^2/(c^2*x^5
 + x^3), x))*x^2)/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2\,\left(e\,x^2 + d\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + e*x^2))/x^3,x)
[Out] int(((a + b*atan(c*x))^2*(d + e*x^2))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))^2\,\left(d + ex^2\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)*(a+b*atan(c*x))**2/x**3,x)
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2)/x**3, x)
```

3.1254 $\int x^3 \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=502

$$-\frac{e^2\left(a+b\tan^{-1}(cx)\right)^2}{8c^8}+\frac{abe^2x}{4c^7}+\frac{de\left(a+b\tan^{-1}(cx)\right)^2}{3c^6}-\frac{2abdex}{3c^5}-\frac{be^2x^3\left(a+b\tan^{-1}(cx)\right)}{12c^5}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{4c^4}+\cdots$$

```
[Out] 1/2*a*b*d^2*x/c^3+1/2*b^2*d^2*x*arctan(c*x)/c^3-1/6*b*d^2*x^3*(a+b*arctan(c
*x))/c-1/4*d^2*(a+b*arctan(c*x))^2/c^4+1/4*d^2*x^4*(a+b*arctan(c*x))^2-1/3*
b^2*d^2*ln(c^2*x^2+1)/c^4-22/105*b^2*e^2*ln(c^2*x^2+1)/c^8+23/45*b^2*d*e*ln
(c^2*x^2+1)/c^6-1/8*e^2*(a+b*arctan(c*x))^2/c^8+1/8*e^2*x^8*(a+b*arctan(c*x
))^2+1/4*b^2*e^2*x*arctan(c*x)/c^7-1/12*b*e^2*x^3*(a+b*arctan(c*x))/c^5+1/2
0*b*e^2*x^5*(a+b*arctan(c*x))/c^3-1/28*b*e^2*x^7*(a+b*arctan(c*x))/c+1/4*a*
b*e^2*x/c^7-8/45*b^2*d*e*x^2/c^4+1/30*b^2*d*e*x^4/c^2+71/840*b^2*e^2*x^2/c^
6-3/140*b^2*e^2*x^4/c^4+1/168*b^2*e^2*x^6/c^2+1/3*d*e*(a+b*arctan(c*x))^2/c
^6+1/3*d*e*x^6*(a+b*arctan(c*x))^2+1/12*b^2*d^2*x^2/c^2-2/3*a*b*d*e*x/c^5-2
/3*b^2*d*e*x*arctan(c*x)/c^5+2/9*b*d*e*x^3*(a+b*arctan(c*x))/c^3-2/15*b*d*e
*x^5*(a+b*arctan(c*x))/c
```

Rubi [A] time = 1.14, antiderivative size = 502, normalized size of antiderivative = 1.00, number of steps used = 50, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}} = 0.348$, Rules used = {4980, 4852, 4916, 266, 43, 4846, 260, 4884}

$$\frac{abd^2x}{2c^3}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{4c^4}+\frac{2bdex^3\left(a+b\tan^{-1}(cx)\right)}{9c^3}-\frac{2abdex}{3c^5}+\frac{de\left(a+b\tan^{-1}(cx)\right)^2}{3c^6}+\frac{be^2x^5\left(a+b\tan^{-1}(cx)\right)}{20c^3}\cdots$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (a*b*d^2*x)/(2*c^3) - (2*a*b*d*e*x)/(3*c^5) + (a*b*e^2*x)/(4*c^7) + (b^2*d^
2*x^2)/(12*c^2) - (8*b^2*d*e*x^2)/(45*c^4) + (71*b^2*e^2*x^2)/(840*c^6) + (
b^2*d*e*x^4)/(30*c^2) - (3*b^2*e^2*x^4)/(140*c^4) + (b^2*e^2*x^6)/(168*c^2)
 + (b^2*d^2*x*ArcTan[c*x])/(2*c^3) - (2*b^2*d*e*x*ArcTan[c*x])/(3*c^5) + (b
^2*e^2*x*ArcTan[c*x])/(4*c^7) - (b*d^2*x^3*(a + b*ArcTan[c*x]))/(6*c) + (2*
b*d*e*x^3*(a + b*ArcTan[c*x]))/(9*c^3) - (b*e^2*x^3*(a + b*ArcTan[c*x]))/(1
2*c^5) - (2*b*d*e*x^5*(a + b*ArcTan[c*x]))/(15*c) + (b*e^2*x^5*(a + b*ArcTa
n[c*x]))/(20*c^3) - (b*e^2*x^7*(a + b*ArcTan[c*x]))/(28*c) - (d^2*(a + b*Ar
cTan[c*x])^2)/(4*c^4) + (d*e*(a + b*ArcTan[c*x])^2)/(3*c^6) - (e^2*(a + b*A
rcTan[c*x])^2)/(8*c^8) + (d^2*x^4*(a + b*ArcTan[c*x])^2)/4 + (d*e*x^6*(a +
b*ArcTan[c*x])^2)/3 + (e^2*x^8*(a + b*ArcTan[c*x])^2)/8 - (b^2*d^2*Log[1 +
c^2*x^2])/(3*c^4) + (23*b^2*d*e*Log[1 + c^2*x^2])/(45*c^6) - (22*b^2*e^2*Lo
g[1 + c^2*x^2])/(105*c^8)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int x^3 \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)^2 dx = \int \left(d^2x^3 \left(a+b\tan^{-1}(cx)\right)^2 + 2dex^5 \left(a+b\tan^{-1}(cx)\right)^2 + e^2x^7 \left(a+b\tan\right.\right.$$
$$= d^2 \int x^3 \left(a+b\tan^{-1}(cx)\right)^2 dx + (2de) \int x^5 \left(a+b\tan^{-1}(cx)\right)^2 dx + e^2 \int$$
$$= \frac{1}{4}d^2x^4 \left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{3}dex^6 \left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{8}e^2x^8 \left(a+b\tan\right.$$
$$= \frac{1}{4}d^2x^4 \left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{3}dex^6 \left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{8}e^2x^8 \left(a+b\tan\right.$$
$$= -\frac{bd^2x^3 \left(a+b\tan^{-1}(cx)\right)}{6c} - \frac{2bdex^5 \left(a+b\tan^{-1}(cx)\right)}{15c} - \frac{be^2x^7 \left(a+b\tan\right.}{28c}$$
$$= \frac{abd^2x}{2c^3} - \frac{bd^2x^3 \left(a+b\tan^{-1}(cx)\right)}{6c} + \frac{2bdex^3 \left(a+b\tan^{-1}(cx)\right)}{9c^3} - \frac{2bdex^5 \left(a\right.}{}$$
$$= \frac{abd^2x}{2c^3} - \frac{2abdex}{3c^5} + \frac{b^2d^2x\tan^{-1}(cx)}{2c^3} - \frac{bd^2x^3 \left(a+b\tan^{-1}(cx)\right)}{6c} + \frac{2bdex^3}{}$$
$$= \frac{abd^2x}{2c^3} - \frac{2abdex}{3c^5} + \frac{abe^2x}{4c^7} + \frac{b^2d^2x^2}{12c^2} - \frac{b^2dex^2}{15c^4} + \frac{b^2e^2x^2}{56c^6} + \frac{b^2dex^4}{30c^2} - \frac{b^2e^2}{112c}$$
$$= \frac{abd^2x}{2c^3} - \frac{2abdex}{3c^5} + \frac{abe^2x}{4c^7} + \frac{b^2d^2x^2}{12c^2} - \frac{8b^2dex^2}{45c^4} + \frac{3b^2e^2x^2}{70c^6} + \frac{b^2dex^4}{30c^2} - \frac{3b}{1}$$
$$= \frac{abd^2x}{2c^3} - \frac{2abdex}{3c^5} + \frac{abe^2x}{4c^7} + \frac{b^2d^2x^2}{12c^2} - \frac{8b^2dex^2}{45c^4} + \frac{71b^2e^2x^2}{840c^6} + \frac{b^2dex^4}{30c^2} - \frac{3}{}$$

Mathematica [A] time = 0.50, size = 414, normalized size = 0.82

$$\frac{cx\left(105a^2c^7x^3\left(6d^2+8dex^2+3e^2x^4\right)-2ab\left(3c^6\left(70d^2x^2+56dex^4+15e^2x^6\right)-7c^4\left(90d^2+40dex^2+9e^2x^4\right)+105\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (c*x*(105*a^2*c^7*x^3*(6*d^2 + 8*d*e*x^2 + 3*e^2*x^4) + b^2*c*x*(213*e^2 -
2*c^2*e*(224*d + 27*e*x^2) + 3*c^4*(70*d^2 + 28*d*e*x^2 + 5*e^2*x^4)) - 2*a
*b*(-315*e^2 + 105*c^2*e*(8*d + e*x^2) - 7*c^4*(90*d^2 + 40*d*e*x^2 + 9*e^2
*x^4) + 3*c^6*(70*d^2*x^2 + 56*d*e*x^4 + 15*e^2*x^6))) + 2*b*(b*c*x*(315*e^
2 - 105*c^2*e*(8*d + e*x^2) + 7*c^4*(90*d^2 + 40*d*e*x^2 + 9*e^2*x^4) - 3*c
^6*(70*d^2*x^2 + 56*d*e*x^4 + 15*e^2*x^6)) + 105*a*(-6*c^4*d^2 + 8*c^2*d*e
- 3*e^2 + c^8*(6*d^2*x^4 + 8*d*e*x^6 + 3*e^2*x^8)))*ArcTan[c*x] + 105*b^2*(
-6*c^4*d^2 + 8*c^2*d*e - 3*e^2 + c^8*(6*d^2*x^4 + 8*d*e*x^6 + 3*e^2*x^8))*A
rcTan[c*x]^2 - 8*b^2*(105*c^4*d^2 - 161*c^2*d*e + 66*e^2)*Log[1 + c^2*x^2])
/(2520*c^8)
```

fricas [A] time = 0.55, size = 530, normalized size = 1.06

$$\frac{315\,a^2c^8e^2x^8-90\,abc^7e^2x^7+15\left(56\,a^2c^8de+b^2c^6e^2\right)x^6-42\left(8\,abc^7de-3\,abc^5e^2\right)x^5+6\left(105\,a^2c^8d^2+14\,b^2c^6de\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/2520*(315*a^2*c^8*e^2*x^8 - 90*a*b*c^7*e^2*x^7 + 15*(56*a^2*c^8*d*e + b^2
*c^6*e^2)*x^6 - 42*(8*a*b*c^7*d*e - 3*a*b*c^5*e^2)*x^5 + 6*(105*a^2*c^8*d^2
 + 14*b^2*c^6*d*e - 9*b^2*c^4*e^2)*x^4 - 70*(6*a*b*c^7*d^2 - 8*a*b*c^5*d*e
+ 3*a*b*c^3*e^2)*x^3 + (210*b^2*c^6*d^2 - 448*b^2*c^4*d*e + 213*b^2*c^2*e^2
)*x^2 + 105*(3*b^2*c^8*e^2*x^8 + 8*b^2*c^8*d*e*x^6 + 6*b^2*c^8*d^2*x^4 - 6*
b^2*c^4*d^2 + 8*b^2*c^2*d*e - 3*b^2*e^2)*arctan(c*x)^2 + 210*(6*a*b*c^5*d^2
 - 8*a*b*c^3*d*e + 3*a*b*c*e^2)*x + 2*(315*a*b*c^8*e^2*x^8 + 840*a*b*c^8*d*
e*x^6 - 45*b^2*c^7*e^2*x^7 + 630*a*b*c^8*d^2*x^4 - 630*a*b*c^4*d^2 + 840*a*
b*c^2*d*e - 21*(8*b^2*c^7*d*e - 3*b^2*c^5*e^2)*x^5 - 315*a*b*e^2 - 35*(6*b^
2*c^7*d^2 - 8*b^2*c^5*d*e + 3*b^2*c^3*e^2)*x^3 + 105*(6*b^2*c^5*d^2 - 8*b^2
*c^3*d*e + 3*b^2*c*e^2)*x)*arctan(c*x) - 8*(105*b^2*c^4*d^2 - 161*b^2*c^2*d
*e + 66*b^2*e^2)*log(c^2*x^2 + 1))/c^8
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 621, normalized size = 1.24

$$\frac{2ab\,x^3de}{9c^3}-\frac{2abed\,x^5}{15c}+\frac{2ab\arctan(cx)\,ed\,x^6}{3}+\frac{2ab\arctan(cx)\,de}{3c^6}-\frac{2b^2\arctan(cx)\,ed\,x^5}{15c}+\frac{2b^2\arctan(cx)\,x^3de}{9c^3}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] 2/9/c^3*a*b*x^3*d*e-2/15/c*a*b*e*d*x^5+2/3*a*b*arctan(c*x)*e*d*x^6+2/3/c^6*
a*b*arctan(c*x)*d*e-2/15/c*b^2*arctan(c*x)*e*d*x^5+2/9/c^3*b^2*arctan(c*x)*
x^3*d*e-2/3*a*b*d*e*x/c^5-2/3*b^2*d*e*x*arctan(c*x)/c^5+1/2*a*b*d^2*x/c^3+1
/2*b^2*d^2*x*arctan(c*x)/c^3+1/12*b^2*d^2*x^2/c^2-1/3*b^2*d^2*ln(c^2*x^2+1)
/c^4-22/105*b^2*e^2*ln(c^2*x^2+1)/c^8-1/28/c*a*b*e^2*x^7-1/6/c*b^2*arctan(c
*x)*d^2*x^3-1/4/c^8*a*b*arctan(c*x)*e^2+1/4*a*b*arctan(c*x)*e^2*x^8-1/6/c*a
*b*d^2*x^3+1/20/c^3*a*b*x^5*e^2-1/12/c^5*a*b*x^3*e^2+1/4*a*b*e^2*x/c^7-8/45
*b^2*d*e*x^2/c^4+1/30*b^2*d*e*x^4/c^2+1/4*b^2*e^2*x*arctan(c*x)/c^7+71/840*
b^2*e^2*x^2/c^6-3/140*b^2*e^2*x^4/c^4+1/168*b^2*e^2*x^6/c^2+1/20/c^3*b^2*ar
ctan(c*x)*x^5*e^2-1/12/c^5*b^2*arctan(c*x)*x^3*e^2-1/2/c^4*a*b*arctan(c*x)*
d^2+1/3*b^2*arctan(c*x)^2*e*d*x^6+1/2*a*b*arctan(c*x)*d^2*x^4-1/28/c*b^2*ar
ctan(c*x)*e^2*x^7+1/3/c^6*b^2*arctan(c*x)^2*d*e+1/8*b^2*arctan(c*x)^2*e^2*x
^8-1/4/c^4*b^2*arctan(c*x)^2*d^2-1/8/c^8*b^2*arctan(c*x)^2*e^2+1/3*a^2*e*d*
x^6+1/4*b^2*arctan(c*x)^2*d^2*x^4+23/45*b^2*d*e*ln(c^2*x^2+1)/c^6+1/8*a^2*e
^2*x^8+1/4*a^2*x^4*d^2
```

maxima [A] time = 0.48, size = 516, normalized size = 1.03

$$\frac{1}{8}\,b^2e^2x^8\arctan(cx)^2+\frac{1}{8}\,a^2e^2x^8+\frac{1}{3}\,b^2dex^6\arctan(cx)^2+\frac{1}{3}\,a^2dex^6+\frac{1}{4}\,b^2d^2x^4\arctan(cx)^2+\frac{1}{4}\,a^2d^2x^4+\frac{1}{6}\Big(3\,x^4\,\mathrm{ar}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/8*b^2*e^2*x^8*arctan(c*x)^2 + 1/8*a^2*e^2*x^8 + 1/3*b^2*d*e*x^6*arctan(c*
x)^2 + 1/3*a^2*d*e*x^6 + 1/4*b^2*d^2*x^4*arctan(c*x)^2 + 1/4*a^2*d^2*x^4 +
1/6*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*b*d
^2 - 1/12*(2*c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)*arctan(c*x) - (c^2
*x^2 + 3*arctan(c*x)^2 - 4*log(c^2*x^2 + 1))/c^4)*b^2*d^2 + 2/45*(15*x^6*ar
```

```
ctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*a*
b*d*e - 1/90*(4*c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^7)
*arctan(c*x) - (3*c^4*x^4 - 16*c^2*x^2 - 30*arctan(c*x)^2 + 46*log(c^2*x^2
+ 1))/c^6)*b^2*d*e + 1/420*(105*x^8*arctan(c*x) - c*((15*c^6*x^7 - 21*c^4*x
^5 + 35*c^2*x^3 - 105*x)/c^8 + 105*arctan(c*x)/c^9))*a*b*e^2 - 1/840*(2*c*(
(15*c^6*x^7 - 21*c^4*x^5 + 35*c^2*x^3 - 105*x)/c^8 + 105*arctan(c*x)/c^9)*a
rctan(c*x) - (5*c^6*x^6 - 18*c^4*x^4 + 71*c^2*x^2 + 105*arctan(c*x)^2 - 176
*log(c^2*x^2 + 1))/c^8)*b^2*e^2
```

mupad [B] time = 6.90, size = 929, normalized size = 1.85

$$\frac{a^2 d^2 x^4}{4}+\frac{a^2 e^2 x^8}{8}-\frac{b^2 d^2 \ln\left(c^2 x^2+1\right)}{3 c^4}-\frac{22 b^2 e^2 \ln\left(c^2 x^2+1\right)}{105 c^8}+\frac{b^2 d^2 x^2}{12 c^2}+\frac{b^2 e^2 x^6}{168 c^2}-\frac{3 b^2 e^2 x^4}{140 c^4}+\frac{71 b^2 e^2 x^2}{840 c^6}-\frac{b^2 d^2 \mathrm{at}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))^2*(d + e*x^2)^2,x)
```

```
[Out] (a^2*d^2*x^4)/4 + (a^2*e^2*x^8)/8 - (b^2*d^2*log(c^2*x^2 + 1))/(3*c^4) - (2
2*b^2*e^2*log(c^2*x^2 + 1))/(105*c^8) + (b^2*d^2*x^2)/(12*c^2) + (b^2*e^2*x
^6)/(168*c^2) - (3*b^2*e^2*x^4)/(140*c^4) + (71*b^2*e^2*x^2)/(840*c^6) - (b
^2*d^2*atan(c*x)^2)/(4*c^4) - (b^2*e^2*atan(c*x)^2)/(8*c^8) + (b^2*d^2*x^4*
atan(c*x)^2)/4 + (b^2*e^2*x^8*atan(c*x)^2)/8 + (a^2*d*e*x^6)/3 - (b^2*d^2*x
^3*atan(c*x))/(6*c) - (b^2*e^2*x^7*atan(c*x))/(28*c) + (b^2*e^2*x^5*atan(c*
x))/(20*c^3) - (b^2*e^2*x^3*atan(c*x))/(12*c^5) + (a*b*d^2*x)/(2*c^3) + (a*
b*e^2*x)/(4*c^7) + (a*b*d^2*x^4*atan(c*x))/2 + (a*b*e^2*x^8*atan(c*x))/4 +
(23*b^2*d*e*log(c^2*x^2 + 1))/(45*c^6) - (a*b*d^2*x^3)/(6*c) - (a*b*e^2*x^7
)/(28*c) + (a*b*e^2*x^5)/(20*c^3) - (a*b*e^2*x^3)/(12*c^5) + (b^2*d*e*x^4)/
(30*c^2) - (8*b^2*d*e*x^2)/(45*c^4) + (b^2*d*e*atan(c*x)^2)/(3*c^6) + (b^2*
d^2*x*atan(c*x))/(2*c^3) + (b^2*e^2*x*atan(c*x))/(4*c^7) + (b^2*d*e*x^6*ata
n(c*x)^2)/3 - (a*b*d^2*atan((3*b*c*e^2*x)/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^2*
d*e) + (6*b*c^5*d^2*x)/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^2*d*e) - (8*b*c^3*d*e
*x)/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^2*d*e)))/(2*c^4) - (a*b*e^2*atan((3*b*c*
e^2*x)/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^2*d*e) + (6*b*c^5*d^2*x)/(3*b*e^2 + 6
*b*c^4*d^2 - 8*b*c^2*d*e) - (8*b*c^3*d*e*x)/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^
2*d*e)))/(4*c^8) - (2*b^2*d*e*x^5*atan(c*x))/(15*c) + (2*b^2*d*e*x^3*atan(c
*x))/(9*c^3) - (2*a*b*d*e*x)/(3*c^5) + (2*a*b*d*e*x^6*atan(c*x))/3 - (2*a*b
*d*e*x^5)/(15*c) + (2*a*b*d*e*x^3)/(9*c^3) - (2*b^2*d*e*x*atan(c*x))/(3*c^5
) + (2*a*b*d*e*atan((3*b*c*e^2*x)/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^2*d*e) + (
6*b*c^5*d^2*x)/(3*b*e^2 + 6*b*c^4*d^2 - 8*b*c^2*d*e) - (8*b*c^3*d*e*x)/(3*b
*e^2 + 6*b*c^4*d^2 - 8*b*c^2*d*e)))/(3*c^6)
```

sympy [A] time = 7.49, size = 758, normalized size = 1.51

$$\begin{cases} \frac{a^2d^2x^4}{4}+\frac{a^2dex^6}{3}+\frac{a^2e^2x^8}{8}+\frac{abd^2x^4\operatorname{atan}(cx)}{2}+\frac{2abdex^6\operatorname{atan}(cx)}{3}+\frac{abe^2x^8\operatorname{atan}(cx)}{4}-\frac{abd^2x^3}{6c}-\frac{2abdex^5}{15c}-\frac{abe^2x^7}{28c}+\frac{abd^2x}{2c^3}+\frac{2abdex^3}{9c^3} \\ a^2\left(\frac{d^2x^4}{4}+\frac{dex^6}{3}+\frac{e^2x^8}{8}\right) \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(e*x**2+d)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**2*x**4/4 + a**2*d*e*x**6/3 + a**2*e**2*x**8/8 + a*b*d**2
*x**4*atan(c*x)/2 + 2*a*b*d*e*x**6*atan(c*x)/3 + a*b*e**2*x**8*atan(c*x)/4
- a*b*d**2*x**3/(6*c) - 2*a*b*d*e*x**5/(15*c) - a*b*e**2*x**7/(28*c) + a*b*
d**2*x/(2*c**3) + 2*a*b*d*e*x**3/(9*c**3) + a*b*e**2*x**5/(20*c**3) - a*b*d
**2*atan(c*x)/(2*c**4) - 2*a*b*d*e*x/(3*c**5) - a*b*e**2*x**3/(12*c**5) + 2
*a*b*d*e*atan(c*x)/(3*c**6) + a*b*e**2*x/(4*c**7) - a*b*e**2*atan(c*x)/(4*c
**8) + b**2*d**2*x**4*atan(c*x)**2/4 + b**2*d*e*x**6*atan(c*x)**2/3 + b**2*
```

```
e**2*x**8*atan(c*x)**2/8 - b**2*d**2*x**3*atan(c*x)/(6*c) - 2*b**2*d*e*x**5
*atan(c*x)/(15*c) - b**2*e**2*x**7*atan(c*x)/(28*c) + b**2*d**2*x**2/(12*c*
*2) + b**2*d*e*x**4/(30*c**2) + b**2*e**2*x**6/(168*c**2) + b**2*d**2*x*ata
n(c*x)/(2*c**3) + 2*b**2*d*e*x**3*atan(c*x)/(9*c**3) + b**2*e**2*x**5*atan(
c*x)/(20*c**3) - b**2*d**2*log(x**2 + c**(-2))/(3*c**4) - b**2*d**2*atan(c*
x)**2/(4*c**4) - 8*b**2*d*e*x**2/(45*c**4) - 3*b**2*e**2*x**4/(140*c**4) -
2*b**2*d*e*x*atan(c*x)/(3*c**5) - b**2*e**2*x**3*atan(c*x)/(12*c**5) + 23*b
**2*d*e*log(x**2 + c**(-2))/(45*c**6) + b**2*d*e*atan(c*x)**2/(3*c**6) + 71
*b**2*e**2*x**2/(840*c**6) + b**2*e**2*x*atan(c*x)/(4*c**7) - 22*b**2*e**2*
log(x**2 + c**(-2))/(105*c**8) - b**2*e**2*atan(c*x)**2/(8*c**8), Ne(c, 0))
, (a**2*(d**2*x**4/4 + d*e*x**6/3 + e**2*x**8/8), True))
```

3.1255 $\int x^2 \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=580

$$-\frac{ie^2\left(a+b\tan^{-1}(cx)\right)^2}{7c^7}-\frac{2be^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{7c^7}+\frac{2ide\left(a+b\tan^{-1}(cx)\right)^2}{5c^5}+\frac{4bde\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}\right.}{5c^5}$$

```
[Out] -1/3*b*d^2*x^2*(a+b*arctan(c*x))/c+1/3*d^2*x^3*(a+b*arctan(c*x))^2-2/7*b*e^
2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^7+1/7*e^2*x^7*(a+b*arctan(c*x))^2-3/5
*b^2*d*e*x/c^4+1/15*b^2*d*e*x^3/c^2+3/5*b^2*d*e*arctan(c*x)/c^5-1/7*b*e^2*x
^2*(a+b*arctan(c*x))/c^5+1/14*b*e^2*x^4*(a+b*arctan(c*x))/c^3-1/21*b*e^2*x^
6*(a+b*arctan(c*x))/c-1/3*I*b^2*d^2*polylog(2,1-2/(1+I*c*x))/c^3-1/7*I*b^2*
e^2*polylog(2,1-2/(1+I*c*x))/c^7+11/42*b^2*e^2*x/c^6-5/126*b^2*e^2*x^3/c^4+
1/105*b^2*e^2*x^5/c^2-11/42*b^2*e^2*arctan(c*x)/c^7+2/5*d*e*x^5*(a+b*arctan
(c*x))^2-1/3*I*d^2*(a+b*arctan(c*x))^2/c^3-1/7*I*e^2*(a+b*arctan(c*x))^2/c^
7+4/5*b*d*e*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^5+1/3*b^2*d^2*x/c^2-1/3*b^2
*d^2*arctan(c*x)/c^3+2/5*I*d*e*(a+b*arctan(c*x))^2/c^5+2/5*I*b^2*d*e*polylo
g(2,1-2/(1+I*c*x))/c^5-2/3*b*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3+2/5*
b*d*e*x^2*(a+b*arctan(c*x))/c^3-1/5*b*d*e*x^4*(a+b*arctan(c*x))/c
```

Rubi [A] time = 1.07, antiderivative size = 580, normalized size of antiderivative = 1.00, number of steps used = 44, number of rules used = 10, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.435, Rules used = {4980, 4852, 4916, 321, 203, 4920, 4854, 2402, 2315, 302}

$$-\frac{ib^2d^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^3}+\frac{2ib^2de\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{5c^5}-\frac{ib^2e^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{7c^7}-\frac{id^2\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (b^2*d^2*x)/(3*c^2) - (3*b^2*d*e*x)/(5*c^4) + (11*b^2*e^2*x)/(42*c^6) + (b^
2*d*e*x^3)/(15*c^2) - (5*b^2*e^2*x^3)/(126*c^4) + (b^2*e^2*x^5)/(105*c^2) -
 (b^2*d^2*ArcTan[c*x])/(3*c^3) + (3*b^2*d*e*ArcTan[c*x])/(5*c^5) - (11*b^2*
e^2*ArcTan[c*x])/(42*c^7) - (b*d^2*x^2*(a + b*ArcTan[c*x]))/(3*c) + (2*b*d*
e*x^2*(a + b*ArcTan[c*x]))/(5*c^3) - (b*e^2*x^2*(a + b*ArcTan[c*x]))/(7*c^5
) - (b*d*e*x^4*(a + b*ArcTan[c*x]))/(5*c) + (b*e^2*x^4*(a + b*ArcTan[c*x]))
/(14*c^3) - (b*e^2*x^6*(a + b*ArcTan[c*x]))/(21*c) - ((I/3)*d^2*(a + b*ArcT
an[c*x])^2)/c^3 + (((2*I)/5)*d*e*(a + b*ArcTan[c*x])^2)/c^5 - ((I/7)*e^2*(a
 + b*ArcTan[c*x])^2)/c^7 + (d^2*x^3*(a + b*ArcTan[c*x])^2)/3 + (2*d*e*x^5*(
a + b*ArcTan[c*x])^2)/5 + (e^2*x^7*(a + b*ArcTan[c*x])^2)/7 - (2*b*d^2*(a +
 b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(3*c^3) + (4*b*d*e*(a + b*ArcTan[c*x])*
Log[2/(1 + I*c*x)])/(5*c^5) - (2*b*e^2*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x
)])/(7*c^7) - ((I/3)*b^2*d^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/c^3 + (((2*I)/5
)*b^2*d*e*PolyLog[2, 1 - 2/(1 + I*c*x)])/c^5 - ((I/7)*b^2*e^2*PolyLog[2, 1
 - 2/(1 + I*c*x)])/c^7
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int x^2\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx = \int\left(d^2x^2\left(a+b\tan^{-1}(cx)\right)^2+2dex^4\left(a+b\tan^{-1}(cx)\right)^2+e^2x^6\left(a+b\tan\right.\right.$$

$$= d^2\int x^2\left(a+b\tan^{-1}(cx)\right)^2\,dx+(2de)\int x^4\left(a+b\tan^{-1}(cx)\right)^2\,dx+e^2\int$$

$$= \frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{7}e^2x^7\left(a+b\tan\right.$$

$$= \frac{1}{3}d^2x^3\left(a+b\tan^{-1}(cx)\right)^2+\frac{2}{5}dex^5\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{7}e^2x^7\left(a+b\tan\right.$$

$$= -\frac{bd^2x^2\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{bdex^4\left(a+b\tan^{-1}(cx)\right)}{5c}-\frac{be^2x^6\left(a+b\tan^{-1}\right.}{21c}$$

$$= \frac{b^2d^2x}{3c^2}-\frac{bd^2x^2\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{2bdex^2\left(a+b\tan^{-1}(cx)\right)}{5c^3}-\frac{bdex^4\left(a\right.}{}$$

$$= \frac{b^2d^2x}{3c^2}-\frac{3b^2dex}{5c^4}+\frac{b^2e^2x}{21c^6}+\frac{b^2dex^3}{15c^2}-\frac{b^2e^2x^3}{63c^4}+\frac{b^2e^2x^5}{105c^2}-\frac{b^2d^2\tan^{-1}(cx)}{3c^3}$$

$$= \frac{b^2d^2x}{3c^2}-\frac{3b^2dex}{5c^4}+\frac{11b^2e^2x}{42c^6}+\frac{b^2dex^3}{15c^2}-\frac{5b^2e^2x^3}{126c^4}+\frac{b^2e^2x^5}{105c^2}-\frac{b^2d^2\tan^{-1}(c}{3c^3}$$

$$= \frac{b^2d^2x}{3c^2}-\frac{3b^2dex}{5c^4}+\frac{11b^2e^2x}{42c^6}+\frac{b^2dex^3}{15c^2}-\frac{5b^2e^2x^3}{126c^4}+\frac{b^2e^2x^5}{105c^2}-\frac{b^2d^2\tan^{-1}(c}{3c^3}$$

$$= \frac{b^2d^2x}{3c^2}-\frac{3b^2dex}{5c^4}+\frac{11b^2e^2x}{42c^6}+\frac{b^2dex^3}{15c^2}-\frac{5b^2e^2x^3}{126c^4}+\frac{b^2e^2x^5}{105c^2}-\frac{b^2d^2\tan^{-1}(c}{3c^3}$$

Mathematica [A] time = 1.78, size = 513, normalized size = 0.88

$$\frac{210a^2c^7d^2x^3+252a^2c^7dex^5+90a^2c^7e^2x^7-210abc^6d^2x^2-126abc^6dex^4-30abc^6e^2x^6+252abc^4dex^2+45abc^4e^2}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x^2*(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (378*a*b*c^2*d*e - 165*a*b*e^2 + 210*b^2*c^5*d^2*x - 378*b^2*c^3*d*e*x + 16
5*b^2*c*e^2*x - 210*a*b*c^6*d^2*x^2 + 252*a*b*c^4*d*e*x^2 - 90*a*b*c^2*e^2*
x^2 + 210*a^2*c^7*d^2*x^3 + 42*b^2*c^5*d*e*x^3 - 25*b^2*c^3*e^2*x^3 - 126*a
*b*c^6*d*e*x^4 + 45*a*b*c^4*e^2*x^4 + 252*a^2*c^7*d*e*x^5 + 6*b^2*c^5*e^2*x
^5 - 30*a*b*c^6*e^2*x^6 + 90*a^2*c^7*e^2*x^7 + 6*b^2*((35*I)*c^4*d^2 - (42*
I)*c^2*d*e + (15*I)*e^2 + c^7*(35*d^2*x^3 + 42*d*e*x^5 + 15*e^2*x^7))*ArcTa
n[c*x]^2 - 3*b*ArcTan[c*x]*(-4*a*c^7*x^3*(35*d^2 + 42*d*e*x^2 + 15*e^2*x^4)
 + b*(1 + c^2*x^2)*(55*e^2 - c^2*e*(126*d + 25*e*x^2) + 2*c^4*(35*d^2 + 21*
d*e*x^2 + 5*e^2*x^4)) + 4*b*(35*c^4*d^2 - 42*c^2*d*e + 15*e^2)*Log[1 + E^((
2*I)*ArcTan[c*x])]) + 210*a*b*c^4*d^2*Log[1 + c^2*x^2] - 252*a*b*c^2*d*e*Lo
g[1 + c^2*x^2] + 90*a*b*e^2*Log[1 + c^2*x^2] + (6*I)*b^2*(35*c^4*d^2 - 42*c
^2*d*e + 15*e^2)*PolyLog[2, -E^((2*I)*ArcTan[c*x])])/(630*c^7)
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\operatorname{integral}\left(a^2e^2x^6+2\,a^2dex^4+a^2d^2x^2+\left(b^2e^2x^6+2\,b^2dex^4+b^2d^2x^2\right)\arctan(cx)^2+2\left(abe^2x^6+2\,abdex^4+abd^2x\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(a^2*e^2*x^6 + 2*a^2*d*e*x^4 + a^2*d^2*x^2 + (b^2*e^2*x^6 + 2*b^2*d
*e*x^4 + b^2*d^2*x^2)*arctan(c*x)^2 + 2*(a*b*e^2*x^6 + 2*a*b*d*e*x^4 + a*b*
d^2*x^2)*arctan(c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.14, size = 1158, normalized size = 2.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/7*a^2*e^2*x^7+1/3*a^2*d^2*x^3+1/5*I/c^5*b^2*ln(c^2*x^2+1)*ln(I+c*x)*d*e-1
/5*I/c^5*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))*d*e+1/5*I/c^5*b^2*ln(-1/2*I*(I+c*x
))*ln(c*x-I)*d*e-1/5*I/c^5*b^2*ln(c^2*x^2+1)*ln(c*x-I)*d*e-1/21/c*b^2*arcta
n(c*x)*e^2*x^6-1/3/c*b^2*arctan(c*x)*x^2*d^2+1/14*I/c^7*b^2*dilog(1/2*I*(c*
x-I))*e^2-1/7/c^5*b^2*arctan(c*x)*x^2*e^2-1/28*I/c^7*b^2*ln(c*x-I)^2*e^2-1/
14*I/c^7*b^2*dilog(-1/2*I*(I+c*x))*e^2+1/28*I/c^7*b^2*ln(I+c*x)^2*e^2-1/12*
I/c^3*b^2*ln(c*x-I)^2*d^2+1/6*I/c^3*b^2*dilog(1/2*I*(c*x-I))*d^2+1/14/c^3*a
*b*x^4*e^2-1/7/c^5*a*b*x^2*e^2+2/3*a*b*arctan(c*x)*d^2*x^3+2/5*b^2*arctan(c
*x)^2*e*d*x^5+2/7*a*b*arctan(c*x)*e^2*x^7+1/7*b^2*arctan(c*x)^2*e^2*x^7+2/5
*a^2*e*d*x^5+1/3*b^2*arctan(c*x)^2*d^2*x^3+1/3*b^2*d^2*x/c^2+1/7/c^7*b^2*ar
ctan(c*x)*ln(c^2*x^2+1)*e^2+1/7/c^7*a*b*ln(c^2*x^2+1)*e^2+1/3/c^3*b^2*arcta
n(c*x)*ln(c^2*x^2+1)*d^2+1/14/c^3*b^2*arctan(c*x)*x^4*e^2+1/3/c^3*a*b*ln(c^
2*x^2+1)*d^2+1/12*I/c^3*b^2*ln(I+c*x)^2*d^2-1/6*I/c^3*b^2*dilog(-1/2*I*(I+c
*x))*d^2-1/3/c*a*b*x^2*d^2-1/21/c*a*b*e^2*x^6-3/5*b^2*d*e*x/c^4+1/15*b^2*d*
e*x^3/c^2+3/5*b^2*d*e*arctan(c*x)/c^5+11/42*b^2*e^2*x/c^6-5/126*b^2*e^2*x^3
/c^4+1/105*b^2*e^2*x^5/c^2-11/42*b^2*e^2*arctan(c*x)/c^7-1/10*I/c^5*b^2*ln(
I+c*x)^2*d*e-1/6*I/c^3*b^2*ln(-1/2*I*(I+c*x))*ln(c*x-I)*d^2-1/6*I/c^3*b^2*l
n(c^2*x^2+1)*ln(I+c*x)*d^2+1/6*I/c^3*b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))*d^2+1/
6*I/c^3*b^2*ln(c^2*x^2+1)*ln(c*x-I)*d^2+1/5*I/c^5*b^2*dilog(-1/2*I*(I+c*x))
*d*e+1/14*I/c^7*b^2*ln(c^2*x^2+1)*ln(c*x-I)*e^2-1/14*I/c^7*b^2*ln(-1/2*I*(I
+c*x))*ln(c*x-I)*e^2-1/14*I/c^7*b^2*ln(c^2*x^2+1)*ln(I+c*x)*e^2+1/14*I/c^7*
b^2*ln(I+c*x)*ln(1/2*I*(c*x-I))*e^2+2/5/c^3*b^2*arctan(c*x)*x^2*d*e-1/5/c*b
^2*arctan(c*x)*x^4*d*e-2/5/c^5*a*b*ln(c^2*x^2+1)*d*e+4/5*a*b*arctan(c*x)*e*
d*x^5-2/5/c^5*b^2*arctan(c*x)*ln(c^2*x^2+1)*d*e-1/5/c*a*b*x^4*d*e+2/5/c^3*a
*b*x^2*d*e+1/10*I/c^5*b^2*ln(c*x-I)^2*d*e-1/5*I/c^5*b^2*dilog(1/2*I*(c*x-I)
)*d*e-1/3*b^2*d^2*arctan(c*x)/c^3
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{7}\,a^2e^2x^7+\frac{2}{5}\,a^2dex^5+\frac{1}{3}\,a^2d^2x^3+\frac{1}{3}\left(2\,x^3\arctan\left(cx\right)-c\left(\frac{x^2}{c^2}-\frac{\log\left(c^2x^2+1\right)}{c^4}\right)\right)abd^2+\frac{1}{5}\left(4\,x^5\arctan\left(cx\right)-c\left(\frac{c^2x}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/7*a^2*e^2*x^7 + 2/5*a^2*d*e*x^5 + 1/3*a^2*d^2*x^3 + 1/3*(2*x^3*arctan(c*x
) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a*b*d^2 + 1/5*(4*x^5*arctan(c*x) -
c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*a*b*d*e + 1/42*(12*x^7*
```

```
arctan(c*x) - c*((2*c^4*x^6 - 3*c^2*x^4 + 6*x^2)/c^6 - 6*log(c^2*x^2 + 1)/c
^8))*a*b*e^2 + 1/420*(15*b^2*e^2*x^7 + 42*b^2*d*e*x^5 + 35*b^2*d^2*x^3)*arc
tan(c*x)^2 - 1/1680*(15*b^2*e^2*x^7 + 42*b^2*d*e*x^5 + 35*b^2*d^2*x^3)*log(
c^2*x^2 + 1)^2 + integrate(1/1680*(1260*(b^2*c^2*e^2*x^8 + (2*b^2*c^2*d*e +
 b^2*e^2)*x^6 + b^2*d^2*x^2 + (b^2*c^2*d^2 + 2*b^2*d*e)*x^4)*arctan(c*x)^2
+ 105*(b^2*c^2*e^2*x^8 + (2*b^2*c^2*d*e + b^2*e^2)*x^6 + b^2*d^2*x^2 + (b^2
*c^2*d^2 + 2*b^2*d*e)*x^4)*log(c^2*x^2 + 1)^2 - 8*(15*b^2*c*e^2*x^7 + 42*b^
2*c*d*e*x^5 + 35*b^2*c*d^2*x^3)*arctan(c*x) + 4*(15*b^2*c^2*e^2*x^8 + 42*b^
2*c^2*d*e*x^6 + 35*b^2*c^2*d^2*x^4)*log(c^2*x^2 + 1))/(c^2*x^2 + 1), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x^2\,(a+b\,\mathrm{atan}\,(c\,x))^2\,\left(e\,x^2+d\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))^2*(d + e*x^2)^2,x)
```

```
[Out] int(x^2*(a + b*atan(c*x))^2*(d + e*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int x^{2} \left(a + b \operatorname{atan}{\left(cx \right)}\right)^{2} \left(d + ex^{2}\right)^{2}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(e*x**2+d)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))**2*(d + e*x**2)**2, x)
```

3.1256 $\int x\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx$

Optimal. Leaf size=380

$$\frac{e^2\left(a+b\tan^{-1}(cx)\right)^2}{6c^6}-\frac{abe^2x}{3c^5}-\frac{de\left(a+b\tan^{-1}(cx)\right)^2}{2c^4}+\frac{abdex}{c^3}+\frac{be^2x^3\left(a+b\tan^{-1}(cx)\right)}{9c^3}+\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^2}+\frac{1}{2}$$

```
[Out] -a*b*d^2*x/c+a*b*d*e*x/c^3-1/3*a*b*e^2*x/c^5+1/6*b^2*d*e*x^2/c^2-4/45*b^2*e
^2*x^2/c^4+1/60*b^2*e^2*x^4/c^2-b^2*d^2*x*arctan(c*x)/c+b^2*d*e*x*arctan(c*
x)/c^3-1/3*b^2*e^2*x*arctan(c*x)/c^5-1/3*b*d*e*x^3*(a+b*arctan(c*x))/c+1/9*
b*e^2*x^3*(a+b*arctan(c*x))/c^3-1/15*b*e^2*x^5*(a+b*arctan(c*x))/c+1/2*d^2*
(a+b*arctan(c*x))^2/c^2-1/2*d*e*(a+b*arctan(c*x))^2/c^4+1/6*e^2*(a+b*arctan
(c*x))^2/c^6+1/2*d^2*x^2*(a+b*arctan(c*x))^2+1/2*d*e*x^4*(a+b*arctan(c*x))^
2+1/6*e^2*x^6*(a+b*arctan(c*x))^2+1/2*b^2*d^2*ln(c^2*x^2+1)/c^2-2/3*b^2*d*e
*ln(c^2*x^2+1)/c^4+23/90*b^2*e^2*ln(c^2*x^2+1)/c^6
```

Rubi [A] time = 0.75, antiderivative size = 380, normalized size of antiderivative = 1.00, number of steps used = 35, number of rules used = 8, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.381, Rules used = {4980, 4852, 4916, 4846, 260, 4884, 266, 43}

$$\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^2}+\frac{abdex}{c^3}-\frac{de\left(a+b\tan^{-1}(cx)\right)^2}{2c^4}+\frac{be^2x^3\left(a+b\tan^{-1}(cx)\right)}{9c^3}-\frac{abe^2x}{3c^5}+\frac{e^2\left(a+b\tan^{-1}(cx)\right)^2}{6c^6}+\frac{1}{2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] -((a*b*d^2*x)/c) + (a*b*d*e*x)/c^3 - (a*b*e^2*x)/(3*c^5) + (b^2*d*e*x^2)/(6
*c^2) - (4*b^2*e^2*x^2)/(45*c^4) + (b^2*e^2*x^4)/(60*c^2) - (b^2*d^2*x*ArcT
an[c*x])/c + (b^2*d*e*x*ArcTan[c*x])/c^3 - (b^2*e^2*x*ArcTan[c*x])/(3*c^5)
- (b*d*e*x^3*(a + b*ArcTan[c*x]))/(3*c) + (b*e^2*x^3*(a + b*ArcTan[c*x]))/(
9*c^3) - (b*e^2*x^5*(a + b*ArcTan[c*x]))/(15*c) + (d^2*(a + b*ArcTan[c*x])^
2)/(2*c^2) - (d*e*(a + b*ArcTan[c*x])^2)/(2*c^4) + (e^2*(a + b*ArcTan[c*x])
^2)/(6*c^6) + (d^2*x^2*(a + b*ArcTan[c*x])^2)/2 + (d*e*x^4*(a + b*ArcTan[c*
x])^2)/2 + (e^2*x^6*(a + b*ArcTan[c*x])^2)/6 + (b^2*d^2*Log[1 + c^2*x^2])/(
2*c^2) - (2*b^2*d*e*Log[1 + c^2*x^2])/(3*c^4) + (23*b^2*e^2*Log[1 + c^2*x^2
])/(90*c^6)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int x\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)^2\,dx=\int\left(d^2x\left(a+b\tan^{-1}(cx)\right)^2+2dex^3\left(a+b\tan^{-1}(cx)\right)^2+e^2x^5\left(a+b\tan^{-1}(\right.\right.$$

$$=d^2\int x\left(a+b\tan^{-1}(cx)\right)^2\,dx+(2de)\int x^3\left(a+b\tan^{-1}(cx)\right)^2\,dx+e^2\int x$$

$$=\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{2}dex^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{6}e^2x^6\left(a+b\tan^{-1}\right.$$

$$=\frac{1}{2}d^2x^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{2}dex^4\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{6}e^2x^6\left(a+b\tan^{-1}\right.$$

$$=-\frac{abd^2x}{c}-\frac{bdex^3\left(a+b\tan^{-1}(cx)\right)}{3c}-\frac{be^2x^5\left(a+b\tan^{-1}(cx)\right)}{15c}+\frac{d^2\left(a+b\,\mathrm{t}\right.}{2}$$

$$=-\frac{abd^2x}{c}+\frac{abdex}{c^3}-\frac{b^2d^2x\tan^{-1}(cx)}{c}-\frac{bdex^3\left(a+b\tan^{-1}(cx)\right)}{3c}+\frac{be^2x^3\left(a\right.}{}$$

$$=-\frac{abd^2x}{c}+\frac{abdex}{c^3}-\frac{abe^2x}{3c^5}-\frac{b^2d^2x\tan^{-1}(cx)}{c}+\frac{b^2dex\tan^{-1}(cx)}{c^3}-\frac{bdex^3\left(\right.}{}$$

$$=-\frac{abd^2x}{c}+\frac{abdex}{c^3}-\frac{abe^2x}{3c^5}+\frac{b^2dex^2}{6c^2}-\frac{b^2e^2x^2}{30c^4}+\frac{b^2e^2x^4}{60c^2}-\frac{b^2d^2x\tan^{-1}(cx)}{c}$$

$$=-\frac{abd^2x}{c}+\frac{abdex}{c^3}-\frac{abe^2x}{3c^5}+\frac{b^2dex^2}{6c^2}-\frac{4b^2e^2x^2}{45c^4}+\frac{b^2e^2x^4}{60c^2}-\frac{b^2d^2x\tan^{-1}(cx)}{c}$$

Mathematica [A] time = 0.35, size = 317, normalized size = 0.83

$$\frac{cx\left(30a^2c^5x\left(3d^2+3dex^2+e^2x^4\right)-4ab\left(3c^4\left(15d^2+5dex^2+e^2x^4\right)-5c^2e\left(9d+ex^2\right)+15e^2\right)+b^2cex\left(3c^2\left(10d\right.\right.\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (c*x*(30*a^2*c^5*x*(3*d^2 + 3*d*e*x^2 + e^2*x^4) + b^2*c*e*x*(-16*e + 3*c^2
*(10*d + e*x^2)) - 4*a*b*(15*e^2 - 5*c^2*e*(9*d + e*x^2) + 3*c^4*(15*d^2 +
5*d*e*x^2 + e^2*x^4))) + 4*b*(-(b*c*x*(15*e^2 - 5*c^2*e*(9*d + e*x^2) + 3*c
^4*(15*d^2 + 5*d*e*x^2 + e^2*x^4))) + 15*a*(3*c^4*d^2 - 3*c^2*d*e + e^2 + c
^6*(3*d^2*x^2 + 3*d*e*x^4 + e^2*x^6)))*ArcTan[c*x] + 30*b^2*(3*c^4*d^2 - 3*
c^2*d*e + e^2 + c^6*(3*d^2*x^2 + 3*d*e*x^4 + e^2*x^6))*ArcTan[c*x]^2 + 2*b^
2*(45*c^4*d^2 - 60*c^2*d*e + 23*e^2)*Log[1 + c^2*x^2])/(180*c^6)
```

fricas [A] time = 0.55, size = 416, normalized size = 1.09

$$\frac{30\,a^2c^6e^2x^6-12\,abc^5e^2x^5+3\left(30\,a^2c^6de+b^2c^4e^2\right)x^4-20\left(3\,abc^5de-abc^3e^2\right)x^3+2\left(45\,a^2c^6d^2+15\,b^2c^4de-8\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] 1/180*(30*a^2*c^6*e^2*x^6 - 12*a*b*c^5*e^2*x^5 + 3*(30*a^2*c^6*d*e + b^2*c^
4*e^2)*x^4 - 20*(3*a*b*c^5*d*e - a*b*c^3*e^2)*x^3 + 2*(45*a^2*c^6*d^2 + 15*
b^2*c^4*d*e - 8*b^2*c^2*e^2)*x^2 + 30*(b^2*c^6*e^2*x^6 + 3*b^2*c^6*d*e*x^4
+ 3*b^2*c^6*d^2*x^2 + 3*b^2*c^4*d^2 - 3*b^2*c^2*d*e + b^2*e^2)*arctan(c*x)^
2 - 60*(3*a*b*c^5*d^2 - 3*a*b*c^3*d*e + a*b*c*e^2)*x + 4*(15*a*b*c^6*e^2*x^
6 + 45*a*b*c^6*d*e*x^4 - 3*b^2*c^5*e^2*x^5 + 45*a*b*c^6*d^2*x^2 + 45*a*b*c^
4*d^2 - 45*a*b*c^2*d*e + 15*a*b*e^2 - 5*(3*b^2*c^5*d*e - b^2*c^3*e^2)*x^3 -
 15*(3*b^2*c^5*d^2 - 3*b^2*c^3*d*e + b^2*c*e^2)*x)*arctan(c*x) + 2*(45*b^2*
c^4*d^2 - 60*b^2*c^2*d*e + 23*b^2*e^2)*log(c^2*x^2 + 1))/c^6
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.06, size = 484, normalized size = 1.27

$$\frac{b^2\arctan\left(cx\right)^2e^2}{6c^6}+\frac{b^2\arctan\left(cx\right)^2e^2x^6}{6}+\frac{d^2b^2\arctan\left(cx\right)^2x^2}{2}+\frac{d^2b^2\arctan\left(cx\right)^2}{2c^2}-\frac{ab\arctan\left(cx\right)de}{c^4}+ab\arctan$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] 1/6/c^6*b^2*arctan(c*x)^2*e^2+1/6*b^2*arctan(c*x)^2*e^2*x^6+1/2*d^2*b^2*arc
tan(c*x)^2*x^2+1/2/c^2*d^2*b^2*arctan(c*x)^2-1/c^4*a*b*arctan(c*x)*d*e+a*b*
arctan(c*x)*x^4*d*e-1/3/c*b^2*arctan(c*x)*x^3*d*e-1/3/c*a*b*x^3*d*e-a*b*d^2
*x/c-b^2*d^2*x*arctan(c*x)/c+1/2*b^2*d^2*ln(c^2*x^2+1)/c^2+23/90*b^2*e^2*ln
(c^2*x^2+1)/c^6+a*b*d*e*x/c^3+b^2*d*e*x*arctan(c*x)/c^3-1/3*a*b*e^2*x/c^5+1
/6*b^2*d*e*x^2/c^2-1/3*b^2*e^2*x*arctan(c*x)/c^5-4/45*b^2*e^2*x^2/c^4+1/60*
b^2*e^2*x^4/c^2+d^2*a*b*arctan(c*x)*x^2+1/c^2*d^2*a*b*arctan(c*x)-1/15/c*a*
```

```
b*x^5*e^2+1/9/c^3*a*b*x^3*e^2+1/3*a*b*arctan(c*x)*e^2*x^6+1/2*b^2*arctan(c*
x)^2*x^4*d*e+1/3/c^6*a*b*arctan(c*x)*e^2+1/9/c^3*b^2*arctan(c*x)*x^3*e^2-1/
2/c^4*b^2*arctan(c*x)^2*d*e-1/15/c*b^2*arctan(c*x)*x^5*e^2+1/2*a^2*x^4*d*e-
2/3*b^2*d*e*ln(c^2*x^2+1)/c^4+1/2*d^2*a^2*x^2+1/6*a^2*e^2*x^6
```

maxima [A] time = 0.48, size = 433, normalized size = 1.14

$$\frac{1}{6}b^2e^2x^6\arctan(cx)^2+\frac{1}{6}a^2e^2x^6+\frac{1}{2}b^2dex^4\arctan(cx)^2+\frac{1}{2}a^2dex^4+\frac{1}{2}b^2d^2x^2\arctan(cx)^2+\frac{1}{2}a^2d^2x^2+\Big(x^2\arctan(c$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/6*b^2*e^2*x^6*arctan(c*x)^2 + 1/6*a^2*e^2*x^6 + 1/2*b^2*d*e*x^4*arctan(c*
x)^2 + 1/2*a^2*d*e*x^4 + 1/2*b^2*d^2*x^2*arctan(c*x)^2 + 1/2*a^2*d^2*x^2 +
(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*a*b*d^2 - 1/2*(2*c*(x/c^2 -
 arctan(c*x)/c^3)*arctan(c*x) + (arctan(c*x)^2 - log(c^2*x^2 + 1))/c^2)*b^2
*d^2 + 1/3*(3*x^4*arctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)
)*a*b*d*e - 1/6*(2*c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5)*arctan(c*x)
- (c^2*x^2 + 3*arctan(c*x)^2 - 4*log(c^2*x^2 + 1))/c^4)*b^2*d*e + 1/45*(15*
x^6*arctan(c*x) - c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*x)/c^
7))*a*b*e^2 - 1/180*(4*c*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c*
x)/c^7)*arctan(c*x) - (3*c^4*x^4 - 16*c^2*x^2 - 30*arctan(c*x)^2 + 46*log(c
^2*x^2 + 1))/c^6)*b^2*e^2
```

mupad [B] time = 5.28, size = 780, normalized size = 2.05

$$\frac{a^2d^2x^2}{2}+\frac{a^2e^2x^6}{6}+\frac{b^2d^2\ln\left(c^2x^2+1\right)}{2c^2}+\frac{23b^2e^2\ln\left(c^2x^2+1\right)}{90c^6}+\frac{b^2e^2x^4}{60c^2}-\frac{4b^2e^2x^2}{45c^4}+\frac{b^2d^2\operatorname{atan}(cx)^2}{2c^2}+\frac{b^2e^2\operatorname{atan}(}{6c^6}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))^2*(d + e*x^2)^2,x)
```

```
[Out] (a^2*d^2*x^2)/2 + (a^2*e^2*x^6)/6 + (b^2*d^2*log(c^2*x^2 + 1))/(2*c^2) + (2
3*b^2*e^2*log(c^2*x^2 + 1))/(90*c^6) + (b^2*e^2*x^4)/(60*c^2) - (4*b^2*e^2*
x^2)/(45*c^4) + (b^2*d^2*atan(c*x)^2)/(2*c^2) + (b^2*e^2*atan(c*x)^2)/(6*c^
6) + (b^2*d^2*x^2*atan(c*x)^2)/2 + (b^2*e^2*x^6*atan(c*x)^2)/6 + (a^2*d*e*x
^4)/2 - (b^2*e^2*x^5*atan(c*x))/(15*c) + (b^2*e^2*x^3*atan(c*x))/(9*c^3) -
(a*b*d^2*x)/c - (a*b*e^2*x)/(3*c^5) + a*b*d^2*x^2*atan(c*x) + (a*b*e^2*x^6*
atan(c*x))/3 - (2*b^2*d*e*log(c^2*x^2 + 1))/(3*c^4) - (a*b*e^2*x^5)/(15*c)
+ (a*b*e^2*x^3)/(9*c^3) + (b^2*d*e*x^2)/(6*c^2) - (b^2*d*e*atan(c*x)^2)/(2*
c^4) - (b^2*d^2*x*atan(c*x))/c - (b^2*e^2*x*atan(c*x))/(3*c^5) + (b^2*d*e*x
^4*atan(c*x)^2)/2 + (a*b*d^2*atan((b*c*e^2*x)/(b*e^2 + 3*b*c^4*d^2 - 3*b*c^
2*d*e) + (3*b*c^5*d^2*x)/(b*e^2 + 3*b*c^4*d^2 - 3*b*c^2*d*e) - (3*b*c^3*d*e
*x)/(b*e^2 + 3*b*c^4*d^2 - 3*b*c^2*d*e)))/c^2 + (a*b*e^2*atan((b*c*e^2*x)/(
b*e^2 + 3*b*c^4*d^2 - 3*b*c^2*d*e) + (3*b*c^5*d^2*x)/(b*e^2 + 3*b*c^4*d^2 -
 3*b*c^2*d*e) - (3*b*c^3*d*e*x)/(b*e^2 + 3*b*c^4*d^2 - 3*b*c^2*d*e)))/(3*c^
6) - (b^2*d*e*x^3*atan(c*x))/(3*c) + (a*b*d*e*x)/c^3 + a*b*d*e*x^4*atan(c*x
) - (a*b*d*e*x^3)/(3*c) + (b^2*d*e*x*atan(c*x))/c^3 - (a*b*d*e*atan((b*c*e^
2*x)/(b*e^2 + 3*b*c^4*d^2 - 3*b*c^2*d*e) + (3*b*c^5*d^2*x)/(b*e^2 + 3*b*c^4
*d^2 - 3*b*c^2*d*e) - (3*b*c^3*d*e*x)/(b*e^2 + 3*b*c^4*d^2 - 3*b*c^2*d*e)))
/c^4
```

sympy [A] time = 4.79, size = 575, normalized size = 1.51

$$\begin{cases}\frac{a^2d^2x^2}{2}+\frac{a^2dex^4}{2}+\frac{a^2e^2x^6}{6}+abd^2x^2\operatorname{atan}(cx)+abdex^4\operatorname{atan}(cx)+\frac{abe^2x^6\operatorname{atan}(cx)}{3}-\frac{abd^2x}{c}-\frac{abdex^3}{3c}-\frac{abe^2x^5}{15c}+\frac{abd^2\operatorname{atan}(c}{c^2}\\ a^2\left(\frac{d^2x^2}{2}+\frac{dex^4}{2}+\frac{e^2x^6}{6}\right)\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(e*x**2+d)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Piecewise((a**2*d**2*x**2/2 + a**2*d*e*x**4/2 + a**2*e**2*x**6/6 + a*b*d**2
*x**2*atan(c*x) + a*b*d*e*x**4*atan(c*x) + a*b*e**2*x**6*atan(c*x)/3 - a*b*
d**2*x/c - a*b*d*e*x**3/(3*c) - a*b*e**2*x**5/(15*c) + a*b*d**2*atan(c*x)/c
**2 + a*b*d*e*x/c**3 + a*b*e**2*x**3/(9*c**3) - a*b*d*e*atan(c*x)/c**4 - a*
b*e**2*x/(3*c**5) + a*b*e**2*atan(c*x)/(3*c**6) + b**2*d**2*x**2*atan(c*x)*
*2/2 + b**2*d*e*x**4*atan(c*x)**2/2 + b**2*e**2*x**6*atan(c*x)**2/6 - b**2*
d**2*x*atan(c*x)/c - b**2*d*e*x**3*atan(c*x)/(3*c) - b**2*e**2*x**5*atan(c*
x)/(15*c) + b**2*d**2*log(x**2 + c**(-2))/(2*c**2) + b**2*d**2*atan(c*x)**2
/(2*c**2) + b**2*d*e*x**2/(6*c**2) + b**2*e**2*x**4/(60*c**2) + b**2*d*e*x*
atan(c*x)/c**3 + b**2*e**2*x**3*atan(c*x)/(9*c**3) - 2*b**2*d*e*log(x**2 +
c**(-2))/(3*c**4) - b**2*d*e*atan(c*x)**2/(2*c**4) - 4*b**2*e**2*x**2/(45*c
**4) - b**2*e**2*x*atan(c*x)/(3*c**5) + 23*b**2*e**2*log(x**2 + c**(-2))/(9
0*c**6) + b**2*e**2*atan(c*x)**2/(6*c**6), Ne(c, 0)), (a**2*(d**2*x**2/2 +
d*e*x**4/2 + e**2*x**6/6), True))
```

3.1257 $\int \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)^2 \, dx$

Optimal. Leaf size=442

$$\frac{ie^2\left(a+b\tan^{-1}(cx)\right)^2}{5c^5}+\frac{2be^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{5c^5}-\frac{2ide\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}-\frac{4bde\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(\right.}{3c^3}$$

```
[Out] 2/3*b^2*d*e*x/c^2-3/10*b^2*e^2*x/c^4+1/30*b^2*e^2*x^3/c^2-2/3*b^2*d*e*arcta
n(c*x)/c^3+3/10*b^2*e^2*arctan(c*x)/c^5-2/3*b*d*e*x^2*(a+b*arctan(c*x))/c+1
/5*b*e^2*x^2*(a+b*arctan(c*x))/c^3-1/10*b*e^2*x^4*(a+b*arctan(c*x))/c+I*d^2
*(a+b*arctan(c*x))^2/c-2/3*I*d*e*(a+b*arctan(c*x))^2/c^3+I*b^2*d^2*polylog(
2,1-2/(1+I*c*x))/c+d^2*x*(a+b*arctan(c*x))^2+2/3*d*e*x^3*(a+b*arctan(c*x))^
2+1/5*e^2*x^5*(a+b*arctan(c*x))^2+2*b*d^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))
/c-4/3*b*d*e*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3+2/5*b*e^2*(a+b*arctan(c*
x))*ln(2/(1+I*c*x))/c^5+1/5*I*b^2*e^2*polylog(2,1-2/(1+I*c*x))/c^5+1/5*I*e^
2*(a+b*arctan(c*x))^2/c^5-2/3*I*b^2*d*e*polylog(2,1-2/(1+I*c*x))/c^3
```

Rubi [A] time = 0.69, antiderivative size = 442, normalized size of antiderivative = 1.00, number of steps used = 30, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4914, 4846, 4920, 4854, 2402, 2315, 4852, 4916, 321, 203, 302}

$$-\frac{2ib^2de\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^3}+\frac{ib^2e^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{5c^5}+\frac{ib^2d^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c}-\frac{2ide\left(a+b\tan^{-1}(cx)\right.}{3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (2*b^2*d*e*x)/(3*c^2) - (3*b^2*e^2*x)/(10*c^4) + (b^2*e^2*x^3)/(30*c^2) - (
2*b^2*d*e*ArcTan[c*x])/(3*c^3) + (3*b^2*e^2*ArcTan[c*x])/(10*c^5) - (2*b*d*
e*x^2*(a + b*ArcTan[c*x]))/(3*c) + (b*e^2*x^2*(a + b*ArcTan[c*x]))/(5*c^3)
- (b*e^2*x^4*(a + b*ArcTan[c*x]))/(10*c) + (I*d^2*(a + b*ArcTan[c*x])^2)/c
- (((2*I)/3)*d*e*(a + b*ArcTan[c*x])^2)/c^3 + ((I/5)*e^2*(a + b*ArcTan[c*x]
)^2)/c^5 + d^2*x*(a + b*ArcTan[c*x])^2 + (2*d*e*x^3*(a + b*ArcTan[c*x])^2)/
3 + (e^2*x^5*(a + b*ArcTan[c*x])^2)/5 + (2*b*d^2*(a + b*ArcTan[c*x])*Log[2/
(1 + I*c*x)])/c - (4*b*d*e*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(3*c^3)
+ (2*b*e^2*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(5*c^5) + (I*b^2*d^2*Pol
yLog[2, 1 - 2/(1 + I*c*x)])/c - (((2*I)/3)*b^2*d*e*PolyLog[2, 1 - 2/(1 + I*
c*x)])/c^3 + ((I/5)*b^2*e^2*PolyLog[2, 1 - 2/(1 + I*c*x)])/c^5
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
```

```
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)^2 dx = \int \left(d^2\left(a+b\tan^{-1}(cx)\right)^2 + 2dex^2\left(a+b\tan^{-1}(cx)\right)^2 + e^2x^4\left(a+b\tan^{-1}(cx\right.\right.$$
$$= d^2\int \left(a+b\tan^{-1}(cx)\right)^2 dx + (2de)\int x^2\left(a+b\tan^{-1}(cx)\right)^2 dx + e^2\int x^4 \left(a\right.$$
$$= d^2x\left(a+b\tan^{-1}(cx)\right)^2 + \frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{5}e^2x^5\left(a+b\tan^{-1}(cx)\right.$$
$$= \frac{id^2\left(a+b\tan^{-1}(cx)\right)^2}{c} + d^2x\left(a+b\tan^{-1}(cx)\right)^2 + \frac{2}{3}dex^3\left(a+b\tan^{-1}(cx)\right)^2$$
$$= -\frac{2bdex^2\left(a+b\tan^{-1}(cx)\right)}{3c} - \frac{be^2x^4\left(a+b\tan^{-1}(cx)\right)}{10c} + \frac{id^2\left(a+b\tan^{-1}(cx\right.}{c}$$
$$= \frac{2b^2dex}{3c^2} - \frac{2bdex^2\left(a+b\tan^{-1}(cx)\right)}{3c} + \frac{be^2x^2\left(a+b\tan^{-1}(cx)\right)}{5c^3} - \frac{be^2x^4\left(a+\right.}{1}$$
$$= \frac{2b^2dex}{3c^2} - \frac{3b^2e^2x}{10c^4} + \frac{b^2e^2x^3}{30c^2} - \frac{2b^2de\tan^{-1}(cx)}{3c^3} - \frac{2bdex^2\left(a+b\tan^{-1}(cx)\right)}{3c} +$$
$$= \frac{2b^2dex}{3c^2} - \frac{3b^2e^2x}{10c^4} + \frac{b^2e^2x^3}{30c^2} - \frac{2b^2de\tan^{-1}(cx)}{3c^3} + \frac{3b^2e^2\tan^{-1}(cx)}{10c^5} - \frac{2bdex^2\left(\right.}{}$$
$$= \frac{2b^2dex}{3c^2} - \frac{3b^2e^2x}{10c^4} + \frac{b^2e^2x^3}{30c^2} - \frac{2b^2de\tan^{-1}(cx)}{3c^3} + \frac{3b^2e^2\tan^{-1}(cx)}{10c^5} - \frac{2bdex^2\left(\right.}{}$$

Mathematica [A] time = 1.11, size = 391, normalized size = 0.88

$$\frac{30a^2c^5d^2x + 20a^2c^5dex^3 + 6a^2c^5e^2x^5 - 20abc^4dex^2 - 3abc^4e^2x^4 + 20abc^2de\log\left(c^2x^2+1\right) + 6abc^2e^2x^2 - 6abe^2\log}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(d + e*x^2)^2*(a + b*ArcTan[c*x])^2,x]
```

```
[Out] (9*a*b*e^2 + 30*a^2*c^5*d^2*x + 20*b^2*c^3*d*e*x - 9*b^2*c*e^2*x - 20*a*b*c
^4*d*e*x^2 + 6*a*b*c^2*e^2*x^2 + 20*a^2*c^5*d*e*x^3 + b^2*c^3*e^2*x^3 - 3*a
*b*c^4*e^2*x^4 + 6*a^2*c^5*e^2*x^5 + 2*b^2*((-15*I)*c^4*d^2 + (10*I)*c^2*d*
e - (3*I)*e^2 + c^5*(15*d^2*x + 10*d*e*x^3 + 3*e^2*x^5))*ArcTan[c*x]^2 + b*
ArcTan[c*x]*(4*a*c^5*x*(15*d^2 + 10*d*e*x^2 + 3*e^2*x^4) - b*e*(1 + c^2*x^2
)*(-9*e + c^2*(20*d + 3*e*x^2)) + 4*b*(15*c^4*d^2 - 10*c^2*d*e + 3*e^2)*Log
[1 + E^((2*I)*ArcTan[c*x])]) - 30*a*b*c^4*d^2*Log[1 + c^2*x^2] + 20*a*b*c^2
*d*e*Log[1 + c^2*x^2] - 6*a*b*e^2*Log[1 + c^2*x^2] - (2*I)*b^2*(15*c^4*d^2
- 10*c^2*d*e + 3*e^2)*PolyLog[2, -E^((2*I)*ArcTan[c*x])])/(30*c^5)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(a^2e^2x^4 + 2\,a^2dex^2 + a^2d^2 + \left(b^2e^2x^4 + 2\,b^2dex^2 + b^2d^2\right)\arctan\left(cx\right)^2 + 2\left(abe^2x^4 + 2\,abdex^2 + abd^2\right)\text{arct}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="fricas")
```

```
[Out] integral(a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*e*x
^2 + b^2*d^2)*arctan(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*arc
tan(c*x), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [B] time = 0.13, size = 1005, normalized size = 2.27

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))^2,x)
```

```
[Out] a^2*x*d^2+1/5*a^2*x^5*e^2+1/5/c^3*a*b*x^2*e^2-1/5/c^5*a*b*ln(c^2*x^2+1)*e^2
-1/5/c^5*b^2*arctan(c*x)*ln(c^2*x^2+1)*e^2-1/10/c*b^2*arctan(c*x)*x^4*e^2+1
/5/c^3*b^2*arctan(c*x)*x^2*e^2+2/3*b^2*arctan(c*x)^2*x^3*d*e+2/5*a*b*arctan
(c*x)*x^5*e^2+1/10*I/c^5*b^2*dilog(-1/2*I*(I+c*x))*e^2-1/20*I/c^5*b^2*ln(I+
c*x)^2*e^2-1/10*I/c^5*b^2*dilog(1/2*I*(c*x-I))*e^2+1/20*I/c^5*b^2*ln(c*x-I)
^2*e^2+1/4*I/c*b^2*ln(c*x-I)^2*d^2+1/2*I/c*b^2*dilog(-1/2*I*(I+c*x))*d^2-1/
2*I/c*b^2*dilog(1/2*I*(c*x-I))*d^2-1/4*I/c*b^2*ln(I+c*x)^2*d^2-1/10/c*a*b*x
^4*e^2+3/10*b^2*e^2*arctan(c*x)/c^5-1/c*b^2*arctan(c*x)*ln(c^2*x^2+1)*d^2+2
*a*b*arctan(c*x)*x*d^2-1/c*a*b*ln(c^2*x^2+1)*d^2+b^2*arctan(c*x)^2*x*d^2-2/
3/c*a*b*x^2*d*e-1/2*I/c*b^2*ln(c^2*x^2+1)*ln(c*x-I)*d^2+1/3*I/c^3*b^2*dilog
(1/2*I*(c*x-I))*d*e-2/3/c*b^2*arctan(c*x)*x^2*d*e+2/3/c^3*b^2*arctan(c*x)*l
n(c^2*x^2+1)*d*e+2/3/c^3*a*b*ln(c^2*x^2+1)*d*e+4/3*a*b*arctan(c*x)*x^3*d*e-
1/10*I/c^5*b^2*ln(c^2*x^2+1)*ln(c*x-I)*e^2-1/10*I/c^5*b^2*ln(I+c*x)*ln(1/2*
I*(c*x-I))*e^2-1/6*I/c^3*b^2*ln(c*x-I)^2*d*e+1/10*I/c^5*b^2*ln(c*x-I)*ln(-1
/2*I*(I+c*x))*e^2+1/2*I/c*b^2*ln(c^2*x^2+1)*ln(I+c*x)*d^2-1/2*I/c*b^2*ln(I+
c*x)*ln(1/2*I*(c*x-I))*d^2+1/2*I/c*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))*d^2+1/6
*I/c^3*b^2*ln(I+c*x)^2*d*e-1/3*I/c^3*b^2*dilog(-1/2*I*(I+c*x))*d*e+1/10*I/c
^5*b^2*ln(c^2*x^2+1)*ln(I+c*x)*e^2-3/10*b^2*e^2*x/c^4+1/30*b^2*e^2*x^3/c^2+
2/3*a^2*x^3*d*e+1/5*b^2*arctan(c*x)^2*x^5*e^2+2/3*b^2*d*e*x/c^2-2/3*b^2*d*e
*arctan(c*x)/c^3-1/3*I/c^3*b^2*ln(c^2*x^2+1)*ln(I+c*x)*d*e+1/3*I/c^3*b^2*ln
(I+c*x)*ln(1/2*I*(c*x-I))*d*e-1/3*I/c^3*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))*d*
e+1/3*I/c^3*b^2*ln(c^2*x^2+1)*ln(c*x-I)*d*e
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{5}a^2e^2x^5+\frac{2}{3}a^2dex^3+180\,b^2c^2e^2\int\frac{x^6\arctan(cx)^2}{240\left(c^2x^2+1\right)}\,dx+15\,b^2c^2e^2\int\frac{x^6\log\left(c^2x^2+1\right)^2}{240\left(c^2x^2+1\right)}\,dx+12\,b^2c^2e^2\int\frac{x^6\log\left(\right.}{240\left(c^2\right.}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2,x, algorithm="maxima")
```

```
[Out] 1/5*a^2*e^2*x^5 + 2/3*a^2*d*e*x^3 + 180*b^2*c^2*e^2*integrate(1/240*x^6*arc
tan(c*x)^2/(c^2*x^2 + 1), x) + 15*b^2*c^2*e^2*integrate(1/240*x^6*log(c^2*x
^2 + 1)^2/(c^2*x^2 + 1), x) + 12*b^2*c^2*e^2*integrate(1/240*x^6*log(c^2*x^
2 + 1)/(c^2*x^2 + 1), x) + 360*b^2*c^2*d*e*integrate(1/240*x^4*arctan(c*x)^
2/(c^2*x^2 + 1), x) + 30*b^2*c^2*d*e*integrate(1/240*x^4*log(c^2*x^2 + 1)^2
/(c^2*x^2 + 1), x) + 40*b^2*c^2*d*e*integrate(1/240*x^4*log(c^2*x^2 + 1)/(c
^2*x^2 + 1), x) + 180*b^2*c^2*d^2*integrate(1/240*x^2*arctan(c*x)^2/(c^2*x^
2 + 1), x) + 15*b^2*c^2*d^2*integrate(1/240*x^2*log(c^2*x^2 + 1)^2/(c^2*x^2
 + 1), x) + 60*b^2*c^2*d^2*integrate(1/240*x^2*log(c^2*x^2 + 1)/(c^2*x^2 +
1), x) + 1/4*b^2*d^2*arctan(c*x)^3/c - 24*b^2*c*e^2*integrate(1/240*x^5*arc
tan(c*x)/(c^2*x^2 + 1), x) - 80*b^2*c*d*e*integrate(1/240*x^3*arctan(c*x)/(
c^2*x^2 + 1), x) - 120*b^2*c*d^2*integrate(1/240*x*arctan(c*x)/(c^2*x^2 + 1
), x) + 2/3*(2*x^3*arctan(c*x) - c*(x^2/c^2 - log(c^2*x^2 + 1)/c^4))*a*b*d*
e + 1/10*(4*x^5*arctan(c*x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)
/c^6))*a*b*e^2 + a^2*d^2*x + 180*b^2*e^2*integrate(1/240*x^4*arctan(c*x)^2/
```

```
(c^2*x^2 + 1), x) + 15*b^2*e^2*integrate(1/240*x^4*log(c^2*x^2 + 1)^2/(c^2*
x^2 + 1), x) + 360*b^2*d*e*integrate(1/240*x^2*arctan(c*x)^2/(c^2*x^2 + 1),
 x) + 30*b^2*d*e*integrate(1/240*x^2*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) +
 15*b^2*d^2*integrate(1/240*log(c^2*x^2 + 1)^2/(c^2*x^2 + 1), x) + (2*c*x*a
rctan(c*x) - log(c^2*x^2 + 1))*a*b*d^2/c + 1/60*(3*b^2*e^2*x^5 + 10*b^2*d*e
*x^3 + 15*b^2*d^2*x)*arctan(c*x)^2 - 1/240*(3*b^2*e^2*x^5 + 10*b^2*d*e*x^3
+ 15*b^2*d^2*x)*log(c^2*x^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int (a+b\,\mathrm{atan}\left(c\,x\right))^2\,{\left(e\,x^2+d\right)}^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2*(d + e*x^2)^2,x)
```

```
[Out] int((a + b*atan(c*x))^2*(d + e*x^2)^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int (a+b\,\mathrm{atan}\,(cx))^2\left(d+ex^2\right)^2\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))**2,x)
```

```
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2)**2, x)
```

3.1258 $\int \frac{(d+ex^2)^2 (a+b\tan^{-1}(cx))^2}{x} dx$

Optimal. Leaf size=355

$$-\frac{e^2 \left(a+b\tan^{-1}(cx)\right)^2}{4c^4}+\frac{abe^2x}{2c^3}+\frac{de\left(a+b\tan^{-1}(cx)\right)^2}{c^2}-ibd^2\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)+ibd^2\text{Li}_2\left(\frac{2}{icx+}\right.$$

```
[Out] -2*a*b*d*e*x/c+1/2*a*b*e^2*x/c^3+1/12*b^2*e^2*x^2/c^2-2*b^2*d*e*x*arctan(c*
x)/c+1/2*b^2*e^2*x*arctan(c*x)/c^3-1/6*b*e^2*x^3*(a+b*arctan(c*x))/c+d*e*(a
+b*arctan(c*x))^2/c^2-1/4*e^2*(a+b*arctan(c*x))^2/c^4+d*e*x^2*(a+b*arctan(c
*x))^2+1/4*e^2*x^4*(a+b*arctan(c*x))^2-2*d^2*(a+b*arctan(c*x))^2*arctanh(-1
+2/(1+I*c*x))+b^2*d*e*ln(c^2*x^2+1)/c^2-1/3*b^2*e^2*ln(c^2*x^2+1)/c^4-I*b*d
^2*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))+I*b*d^2*(a+b*arctan(c*x))*pol
ylog(2,-1+2/(1+I*c*x))-1/2*b^2*d^2*polylog(3,1-2/(1+I*c*x))+1/2*b^2*d^2*pol
ylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.69, antiderivative size = 355, normalized size of antiderivative = 1.00, number of steps used = 25, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4980, 4850, 4988, 4884, 4994, 6610, 4852, 4916, 4846, 260, 266, 43}

$$-ibd^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+ibd^2\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}b^2d^2\text{Pol}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] (-2*a*b*d*e*x)/c + (a*b*e^2*x)/(2*c^3) + (b^2*e^2*x^2)/(12*c^2) - (2*b^2*d*
e*x*ArcTan[c*x])/c + (b^2*e^2*x*ArcTan[c*x])/(2*c^3) - (b*e^2*x^3*(a + b*Ar
cTan[c*x]))/(6*c) + (d*e*(a + b*ArcTan[c*x])^2)/c^2 - (e^2*(a + b*ArcTan[c*
x])^2)/(4*c^4) + d*e*x^2*(a + b*ArcTan[c*x])^2 + (e^2*x^4*(a + b*ArcTan[c*x
])^2)/4 + 2*d^2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + (b^2*d*e
*Log[1 + c^2*x^2])/c^2 - (b^2*e^2*Log[1 + c^2*x^2])/(3*c^4) - I*b*d^2*(a +
b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] + I*b*d^2*(a + b*ArcTan[c*x])*
PolyLog[2, -1 + 2/(1 + I*c*x)] - (b^2*d^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/2
+ (b^2*d^2*PolyLog[3, -1 + 2/(1 + I*c*x)])/2
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
```

```
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx = \int \left(\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x} + 2dex\left(a+b\tan^{-1}(cx)\right)^2 + e^2x^3\left(a+b\tan^{-1}(\right.\right.$$

$$= d^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx + (2de)\int x\left(a+b\tan^{-1}(cx)\right)^2\,dx + e^2\int x^3$$

$$= dex^2\left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{4}e^2x^4\left(a+b\tan^{-1}(cx)\right)^2 + 2d^2\left(a+b\tan^{-1}(cx\right.$$

$$= dex^2\left(a+b\tan^{-1}(cx)\right)^2 + \frac{1}{4}e^2x^4\left(a+b\tan^{-1}(cx)\right)^2 + 2d^2\left(a+b\tan^{-1}(cx\right.$$

$$= -\frac{2abdex}{c} - \frac{be^2x^3\left(a+b\tan^{-1}(cx)\right)}{6c} + \frac{de\left(a+b\tan^{-1}(cx)\right)^2}{c^2} + dex^2\left(a+\right.$$

$$= -\frac{2abdex}{c} + \frac{abe^2x}{2c^3} - \frac{2b^2dex\tan^{-1}(cx)}{c} - \frac{be^2x^3\left(a+b\tan^{-1}(cx)\right)}{6c} + \frac{de\left(a\right.}{}$$

$$= -\frac{2abdex}{c} + \frac{abe^2x}{2c^3} - \frac{2b^2dex\tan^{-1}(cx)}{c} + \frac{b^2e^2x\tan^{-1}(cx)}{2c^3} - \frac{be^2x^3\left(a+b\right.}{6c}$$

$$= -\frac{2abdex}{c} + \frac{abe^2x}{2c^3} + \frac{b^2e^2x^2}{12c^2} - \frac{2b^2dex\tan^{-1}(cx)}{c} + \frac{b^2e^2x\tan^{-1}(cx)}{2c^3} - \frac{be^2}{}$$

Mathematica [A] time = 0.72, size = 389, normalized size = 1.10

$$a^2d^2\log(x)+a^2dex^2+\frac{1}{4}a^2e^2x^4+\frac{2abde\left(\left(c^2x^2+1\right)\tan^{-1}(cx)-cx\right)}{c^2}+\frac{abe^2\left(3\left(c^4x^4-1\right)\tan^{-1}(cx)-c^3x^3+3cx\right)}{6c^4}+$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x])^2)/x,x]
```

```
[Out] a^2*d*e*x^2 + (a^2*e^2*x^4)/4 + (2*a*b*d*e*(-(c*x) + (1 + c^2*x^2)*ArcTan[c
*x]))/c^2 + (a*b*e^2*(3*c*x - c^3*x^3 + 3*(-1 + c^4*x^4)*ArcTan[c*x]))/(6*c
^4) + a^2*d^2*Log[x] + (b^2*e^2*(1 + c^2*x^2 + (6*c*x - 2*c^3*x^3)*ArcTan[c
*x] + 3*(-1 + c^4*x^4)*ArcTan[c*x]^2 - 4*Log[1 + c^2*x^2]))/(12*c^4) + (b^2
*d*e*(-2*c*x*ArcTan[c*x] + (1 + c^2*x^2)*ArcTan[c*x]^2 + Log[1 + c^2*x^2]))
/c^2 + I*a*b*d^2*(PolyLog[2, (-I)*c*x] - PolyLog[2, I*c*x]) + b^2*d^2*((-1/
24*I)*Pi^3 + ((2*I)/3)*ArcTan[c*x]^3 + ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcT
an[c*x])] - ArcTan[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] + I*ArcTan[c*x]*Po
lyLog[2, E^((-2*I)*ArcTan[c*x])] + I*ArcTan[c*x]*PolyLog[2, -E^((2*I)*ArcTa
n[c*x])] + PolyLog[3, E^((-2*I)*ArcTan[c*x])]/2 - PolyLog[3, -E^((2*I)*ArcT
an[c*x])]/2)
```

fricas [F] time = 0.47, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2e^2x^4 + 2\,a^2dex^2 + a^2d^2 + \left(b^2e^2x^4 + 2\,b^2dex^2 + b^2d^2\right)\arctan(cx)^2 + 2\left(abe^2x^4 + 2\,abdex^2 + abd^2\right)a}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x,x, algorithm="fricas")
```

```
[Out] integral((a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*e*
x^2 + b^2*d^2)*arctan(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*ar
ctan(c*x))/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 7.83, size = 1549, normalized size = 4.36

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))^2/x,x)
```

```
[Out] -2*a*b*d*e*x/c-2*b^2*d*e*x*arctan(c*x)/c+2*a*b*e*arctan(c*x)*x^2*d+2/c^2*a*
b*e*arctan(c*x)*d+1/12*b^2*e^2*x^2/c^2+1/c^2*b^2*e*arctan(c*x)^2*d+a^2*e*x^
2*d+1/2*I*b^2*d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((1+I*c*x)^
2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+
1)+1))*arctan(c*x)^2+I*b^2*d^2*arctan(c*x)*polylog(2,-(1+I*c*x)^2/(c^2*x^2+
1))-2*I*b^2*d^2*arctan(c*x)*polylog(2,(1+I*c*x)/(c^2*x^2+1)^(1/2))-2*I*b^2*
d^2*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2*I*b^2*d^2*Pi*ar
ctan(c*x)^2-2/3*I*b^2/c^4*arctan(c*x)*e^2-1/2*I*b^2*d^2*Pi*csgn(I*((1+I*c*x
)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+
1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-1/2*I*b^2*d^2*Pi*csgn(I/
((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^
2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2*d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2
*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((
1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-2*b^2/c^2*e*d*ln((1+I*c*x)^2/(c^2*
x^2+1)+1)-1/4*b^2/c^4*arctan(c*x)^2*e^2+1/4*b^2*arctan(c*x)^2*x^4*e^2+2/3*b
^2/c^4*e^2*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+b^2*arctan(c*x)^2*d^2*ln(c*x)+b^2*
d^2*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(1/2))+b^2*d^2*arctan(c*x)^2*l
n(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))-b^2*d^2*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*
x^2+1)-1)-1/6*a*b/c*x^3*e^2-1/6*b^2/c*arctan(c*x)*x^3*e^2-1/2*I*b^2*d^2*Pi*
csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+
I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/4*a^2*x^4*e^2+2*b^2*d^2*polylog(
3,-(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*b^2*d^2*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(
1/2))-1/2*b^2*d^2*polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+a^2*d^2*ln(c*x)+1/12*
b^2/c^4*e^2-1/2*I*b^2*d^2*Pi*csgn(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/
(c^2*x^2+1)+1))^2*arctan(c*x)^2+1/2*I*b^2*d^2*Pi*csgn(I*((1+I*c*x)^2/(c^2*x
^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+1/2*I*b^2*d^2*Pi*csgn
(((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+2
*I*b^2/c^2*arctan(c*x)*e*d+I*a*b*d^2*ln(c*x)*ln(1+I*c*x)-I*a*b*d^2*ln(c*x)*
ln(1-I*c*x)+1/2*a*b*arctan(c*x)*x^4*e^2+2*a*b*arctan(c*x)*d^2*ln(c*x)+I*a*b
*d^2*dilog(1+I*c*x)-I*a*b*d^2*dilog(1-I*c*x)-1/2*a*b/c^4*arctan(c*x)*e^2+1/
2*a*b*e^2*x/c^3+1/2*b^2*e^2*x*arctan(c*x)/c^3+b^2*e*arctan(c*x)^2*x^2*d
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{4}\,a^2e^2x^4+12\,b^2c^2e^2\int\frac{x^6\arctan\left(cx\right)^2}{16\left(c^2x^3+x\right)}\,dx+b^2c^2e^2\int\frac{x^6\log\left(c^2x^2+1\right)^2}{16\left(c^2x^3+x\right)}\,dx+32\,abc^2e^2\int\frac{x^6\arctan\left(cx\right)}{16\left(c^2x^3+x\right)}\,dx+b^2c^2e^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x,x, algorithm="maxima")
```

```
[Out] 1/4*a^2*e^2*x^4 + 12*b^2*c^2*e^2*integrate(1/16*x^6*arctan(c*x)^2/(c^2*x^3
+ x), x) + b^2*c^2*e^2*integrate(1/16*x^6*log(c^2*x^2 + 1)^2/(c^2*x^3 + x),
 x) + 32*a*b*c^2*e^2*integrate(1/16*x^6*arctan(c*x)/(c^2*x^3 + x), x) + b^2
*c^2*e^2*integrate(1/16*x^6*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + 24*b^2*c^2
*d*e*integrate(1/16*x^4*arctan(c*x)^2/(c^2*x^3 + x), x) + 2*b^2*c^2*d*e*int
egrate(1/16*x^4*log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 64*a*b*c^2*d*e*integ
rate(1/16*x^4*arctan(c*x)/(c^2*x^3 + x), x) + 4*b^2*c^2*d*e*integrate(1/16*
x^4*log(c^2*x^2 + 1)/(c^2*x^3 + x), x) + 12*b^2*c^2*d^2*integrate(1/16*x^2*
arctan(c*x)^2/(c^2*x^3 + x), x) + 32*a*b*c^2*d^2*integrate(1/16*x^2*arctan(
c*x)/(c^2*x^3 + x), x) + 1/96*b^2*d^2*log(c^2*x^2 + 1)^3 + a^2*d*e*x^2 - 2*
b^2*c*e^2*integrate(1/16*x^5*arctan(c*x)/(c^2*x^3 + x), x) - 8*b^2*c*d*e*in
tegrate(1/16*x^3*arctan(c*x)/(c^2*x^3 + x), x) + 12*b^2*e^2*integrate(1/16*
x^4*arctan(c*x)^2/(c^2*x^3 + x), x) + b^2*e^2*integrate(1/16*x^4*log(c^2*x^
2 + 1)^2/(c^2*x^3 + x), x) + 32*a*b*e^2*integrate(1/16*x^4*arctan(c*x)/(c^2
*x^3 + x), x) + 24*b^2*d*e*integrate(1/16*x^2*arctan(c*x)^2/(c^2*x^3 + x),
x) + 64*a*b*d*e*integrate(1/16*x^2*arctan(c*x)/(c^2*x^3 + x), x) + 12*b^2*d
^2*integrate(1/16*arctan(c*x)^2/(c^2*x^3 + x), x) + b^2*d^2*integrate(1/16*
log(c^2*x^2 + 1)^2/(c^2*x^3 + x), x) + 32*a*b*d^2*integrate(1/16*arctan(c*x
)/(c^2*x^3 + x), x) + 1/48*b^2*d*e*log(c^2*x^2 + 1)^3/c^2 + a^2*d^2*log(x)
+ 1/16*(b^2*e^2*x^4 + 4*b^2*d*e*x^2)*arctan(c*x)^2 - 1/64*(b^2*e^2*x^4 + 4*
b^2*d*e*x^2)*log(c^2*x^2 + 1)^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2\,\left(e\,x^2 + d\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + e*x^2)^2)/x,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + e*x^2)^2)/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(cx))^2\,\left(d + ex^2\right)^2}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))**2/x,x)
```

```
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2)**2/x, x)
```

3.1259 $\int \frac{(d+ex^2)^2 (a+b\tan^{-1}(cx))^2}{x^2}\,dx$

Optimal. Leaf size=343

$$-\frac{ie^2\left(a+b\tan^{-1}(cx)\right)^2}{3c^3}-\frac{2be^2\log\left(\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{3c^3}-icd^2\left(a+b\tan^{-1}(cx)\right)^2-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}+2bcd^2$$

```
[Out] 1/3*b^2*e^2*x/c^2-1/3*b^2*e^2*arctan(c*x)/c^3-1/3*b*e^2*x^2*(a+b*arctan(c*x
))/c-I*c*d^2*(a+b*arctan(c*x))^2+2*I*d*e*(a+b*arctan(c*x))^2/c-1/3*I*e^2*(a
+b*arctan(c*x))^2/c^3-d^2*(a+b*arctan(c*x))^2/x+2*d*e*x*(a+b*arctan(c*x))^2
+1/3*e^2*x^3*(a+b*arctan(c*x))^2+4*b*d*e*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/
c-2/3*b*e^2*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/c^3+2*b*c*d^2*(a+b*arctan(c*x
))*ln(2-2/(1-I*c*x))-I*b^2*c*d^2*polylog(2,-1+2/(1-I*c*x))+2*I*b^2*d*e*poly
log(2,1-2/(1+I*c*x))/c-1/3*I*b^2*e^2*polylog(2,1-2/(1+I*c*x))/c^3
```

Rubi [A] time = 0.58, antiderivative size = 343, normalized size of antiderivative = 1.00, number of steps used = 20, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {4980, 4846, 4920, 4854, 2402, 2315, 4852, 4924, 4868, 2447, 4916, 321, 203}

$$-\frac{ib^2e^2\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{3c^3}-ib^2cd^2\text{PolyLog}\left(2,-1+\frac{2}{1-icx}\right)+\frac{2ib^2de\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)}{c}-\frac{ie^2\left(a+b\tan^{-1}(c\right.}{3c^3}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] (b^2*e^2*x)/(3*c^2) - (b^2*e^2*ArcTan[c*x])/(3*c^3) - (b*e^2*x^2*(a + b*Arc
Tan[c*x]))/(3*c) - I*c*d^2*(a + b*ArcTan[c*x])^2 + ((2*I)*d*e*(a + b*ArcTan
[c*x])^2)/c - ((I/3)*e^2*(a + b*ArcTan[c*x])^2)/c^3 - (d^2*(a + b*ArcTan[c*
x])^2)/x + 2*d*e*x*(a + b*ArcTan[c*x])^2 + (e^2*x^3*(a + b*ArcTan[c*x])^2)/
3 + (4*b*d*e*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/c - (2*b*e^2*(a + b*Ar
cTan[c*x])*Log[2/(1 + I*c*x)])/(3*c^3) + 2*b*c*d^2*(a + b*ArcTan[c*x])*Log[
2 - 2/(1 - I*c*x)] - I*b^2*c*d^2*PolyLog[2, -1 + 2/(1 - I*c*x)] + ((2*I)*b^
2*d*e*PolyLog[2, 1 - 2/(1 + I*c*x)])/c - ((I/3)*b^2*e^2*PolyLog[2, 1 - 2/(1
 + I*c*x)])/c^3
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
```

```
e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx = \int \left(2de\left(a+b\tan^{-1}(cx)\right)^2+\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x^2}+e^2x^2\left(a+b\tan^{-1}(cx)\right)\right.$$

$$= d^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx+(2de)\int \left(a+b\tan^{-1}(cx)\right)^2\,dx+e^2\int x^2\,(a+$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}+2dex\left(a+b\tan^{-1}(cx)\right)^2+\frac{1}{3}e^2x^3\left(a+b\tan^{-1}(cx)\right)$$

$$= -icd^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{2ide\left(a+b\tan^{-1}(cx)\right)^2}{c}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{x}$$

$$= -\frac{be^2x^2\left(a+b\tan^{-1}(cx)\right)}{3c}-icd^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{2ide\left(a+b\tan^{-1}(cx)\right)}{c}$$

$$= \frac{b^2e^2x}{3c^2}-\frac{be^2x^2\left(a+b\tan^{-1}(cx)\right)}{3c}-icd^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{2ide\left(a+b\tan\right.}{c}$$

$$= \frac{b^2e^2x}{3c^2}-\frac{b^2e^2\tan^{-1}(cx)}{3c^3}-\frac{be^2x^2\left(a+b\tan^{-1}(cx)\right)}{3c}-icd^2\left(a+b\tan^{-1}(cx)\right)^2$$

$$= \frac{b^2e^2x}{3c^2}-\frac{b^2e^2\tan^{-1}(cx)}{3c^3}-\frac{be^2x^2\left(a+b\tan^{-1}(cx)\right)}{3c}-icd^2\left(a+b\tan^{-1}(cx)\right)^2$$

Mathematica [A] time = 0.83, size = 349, normalized size = 1.02

$$\frac{1}{3}\left(-\frac{3a^2d^2}{x}+6a^2dex+a^2e^2x^3-\frac{3abd^2\left(cx\left(\log\left(c^2x^2+1\right)-2\log(cx)\right)+2\tan^{-1}(cx)\right)}{x}+\frac{6abde\left(2cx\tan^{-1}(cx)-l\right.}{c}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x])^2)/x^2,x]
```

```
[Out] ((-3*a^2*d^2)/x + 6*a^2*d*e*x + a^2*e^2*x^3 + (6*a*b*d*e*(2*c*x*ArcTan[c*x]
 - Log[1 + c^2*x^2]))/c + (a*b*e^2*(-(c^2*x^2) + 2*c^3*x^3*ArcTan[c*x] + Lo
g[1 + c^2*x^2]))/c^3 - (3*a*b*d^2*(2*ArcTan[c*x] + c*x*(-2*Log[c*x] + Log[1
 + c^2*x^2])))/x + (6*b^2*d*e*(ArcTan[c*x]*((-I + c*x)*ArcTan[c*x] + 2*Log[
1 + E^((2*I)*ArcTan[c*x])]) - I*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/c + (b
^2*e^2*(c*x + (I + c^3*x^3)*ArcTan[c*x]^2 - ArcTan[c*x]*(1 + c^2*x^2 + 2*Lo
g[1 + E^((2*I)*ArcTan[c*x])]) + I*PolyLog[2, -E^((2*I)*ArcTan[c*x])]))/c^3
+ 3*b^2*c*d^2*(ArcTan[c*x]*((-I - 1/(c*x))*ArcTan[c*x] + 2*Log[1 - E^((2*I)
*ArcTan[c*x])]) - I*PolyLog[2, E^((2*I)*ArcTan[c*x])]))/3
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2e^2x^4 + 2\,a^2dex^2 + a^2d^2 + \left(b^2e^2x^4 + 2\,b^2dex^2 + b^2d^2\right)\arctan\left(cx\right)^2 + 2\left(abe^2x^4 + 2\,abdex^2 + abd^2\right)a}{x^2}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^2,x, algorithm="fricas")
```

```
[Out] integral((a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*e*
x^2 + b^2*d^2)*arctan(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*ar
ctan(c*x))/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 0.14, size = 997, normalized size = 2.91

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^2,x)
```

```
[Out] -1/3*b^2*e^2*arctan(c*x)/c^3-a^2*d^2/x+1/3*a^2*e^2*x^3-2*a*b*arctan(c*x)*d^
2/x-I*b^2/c*ln(1/2*I*(c*x-I))*ln(I+c*x)*d*e-I*b^2/c*ln(c^2*x^2+1)*ln(c*x-I)
*d*e+I*b^2/c*ln(c*x-I)*ln(-1/2*I*(I+c*x))*d*e+I*b^2/c*ln(c^2*x^2+1)*ln(I+c*
x)*d*e+1/3/c^3*a*b*e^2*ln(c^2*x^2+1)-1/3/c*b^2*e^2*arctan(c*x)*x^2+2/3*a*b*
e^2*arctan(c*x)*x^3+1/3*b^2*e^2*x/c^2+2*a^2*e*d*x-b^2*arctan(c*x)^2*d^2/x+1
/3/c^3*b^2*e^2*arctan(c*x)*ln(c^2*x^2+1)+1/3*b^2*e^2*arctan(c*x)^2*x^3+I*c*
b^2*d^2*dilog(1+I*c*x)+2*b^2*arctan(c*x)^2*e*d*x-1/6*I*b^2/c^3*dilog(-1/2*I
*(I+c*x))*e^2+1/12*I*b^2/c^3*ln(I+c*x)^2*e^2-1/12*I*b^2/c^3*ln(c*x-I)^2*e^2
+1/6*I*b^2/c^3*dilog(1/2*I*(c*x-I))*e^2-I*c*b^2*d^2*dilog(1-I*c*x)+1/4*I*c*
b^2*ln(c*x-I)^2*d^2+1/2*I*c*b^2*dilog(-1/2*I*(I+c*x))*d^2-1/2*I*c*b^2*dilog
(1/2*I*(c*x-I))*d^2-1/4*I*c*b^2*ln(I+c*x)^2*d^2-c*b^2*arctan(c*x)*ln(c^2*x^
2+1)*d^2+2*c*b^2*arctan(c*x)*d^2*ln(c*x)-c*a*b*ln(c^2*x^2+1)*d^2+2*c*a*b*d^
2*ln(c*x)-1/6*I*b^2/c^3*ln(c*x-I)*ln(-1/2*I*(I+c*x))*e^2-1/6*I*b^2/c^3*ln(c
^2*x^2+1)*ln(I+c*x)*e^2+1/6*I*b^2/c^3*ln(1/2*I*(c*x-I))*ln(I+c*x)*e^2-1/2*I
*b^2/c*ln(I+c*x)^2*d*e-I*b^2/c*dilog(1/2*I*(c*x-I))*d*e+4*a*b*arctan(c*x)*e
*d*x+1/6*I*b^2/c^3*ln(c^2*x^2+1)*ln(c*x-I)*e^2+1/2*I*c*b^2*ln(c^2*x^2+1)*ln
(I+c*x)*d^2+1/2*I*c*b^2*ln(c*x-I)*ln(-1/2*I*(I+c*x))*d^2-I*c*b^2*d^2*ln(c*x
)*ln(1-I*c*x)-1/2*I*c*b^2*ln(1/2*I*(c*x-I))*ln(I+c*x)*d^2+1/2*I*b^2/c*ln(c*
x-I)^2*d*e+I*c*b^2*d^2*ln(c*x)*ln(1+I*c*x)+I*b^2/c*dilog(-1/2*I*(I+c*x))*d*
e-2*a*b/c*ln(c^2*x^2+1)*d*e-2*b^2/c*arctan(c*x)*ln(c^2*x^2+1)*d*e-1/2*I*c*b
^2*ln(c^2*x^2+1)*ln(c*x-I)*d^2-1/3/c*a*b*x^2*e^2
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2\,\left(e\,x^2+d\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + e*x^2)^2)/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + e*x^2)^2)/x^2, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(cx))^2\,\left(d+ex^2\right)^2}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))**2/x**2,x)
```

```
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2)**2/x**2, x)
```

3.1260 $\int \frac{(d+ex^2)^2(a+b\tan^{-1}(cx))^2}{x^3}\,dx$

Optimal. Leaf size=320

$$-\frac{1}{2}c^2d^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{e^2\left(a+b\tan^{-1}(cx)\right)^2}{2c^2}-\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}-\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}-2ibde\text{Li}_2\left(1-\right.$$

```
[Out] -a*b*e^2*x/c-b^2*e^2*x*arctan(c*x)/c-b*c*d^2*(a+b*arctan(c*x))/x-1/2*c^2*d^
2*(a+b*arctan(c*x))^2+1/2*e^2*(a+b*arctan(c*x))^2/c^2-1/2*d^2*(a+b*arctan(c
*x))^2/x^2+1/2*e^2*x^2*(a+b*arctan(c*x))^2-4*d*e*(a+b*arctan(c*x))^2*arctan
h(-1+2/(1+I*c*x))+b^2*c^2*d^2*ln(x)-1/2*b^2*c^2*d^2*ln(c^2*x^2+1)+1/2*b^2*e
^2*ln(c^2*x^2+1)/c^2-2*I*b*d*e*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))+2
*I*b*d*e*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))-b^2*d*e*polylog(3,1-2/
(1+I*c*x))+b^2*d*e*polylog(3,-1+2/(1+I*c*x))
```

Rubi [A] time = 0.61, antiderivative size = 320, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 15, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.652, Rules used = {4980, 4852, 4918, 266, 36, 29, 31, 4884, 4850, 4988, 4994, 6610, 4916, 4846, 260}

$$-2ibde\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)+2ibde\text{PolyLog}\left(2,-1+\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)-b^2de\text{Pol}$$

Antiderivative was successfully verified.

```
[In] Int[((d + e*x^2)^2*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] -((a*b*e^2*x)/c) - (b^2*e^2*x*ArcTan[c*x])/c - (b*c*d^2*(a + b*ArcTan[c*x])
)/x - (c^2*d^2*(a + b*ArcTan[c*x])^2)/2 + (e^2*(a + b*ArcTan[c*x])^2)/(2*c^
2) - (d^2*(a + b*ArcTan[c*x])^2)/(2*x^2) + (e^2*x^2*(a + b*ArcTan[c*x])^2)/
2 + 4*d*e*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)] + b^2*c^2*d^2*Lo
g[x] - (b^2*c^2*d^2*Log[1 + c^2*x^2])/2 + (b^2*e^2*Log[1 + c^2*x^2])/(2*c^2
) - (2*I)*b*d*e*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)] + (2*I)*b
*d*e*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)] - b^2*d*e*PolyLog[3
, 1 - 2/(1 + I*c*x)] + b^2*d*e*PolyLog[3, -1 + 2/(1 + I*c*x)]
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
```

```
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(d+ex^2\right)^2 \left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx = \int \left(\frac{d^2 \left(a+b\tan^{-1}(cx)\right)^2}{x^3}+\frac{2de\left(a+b\tan^{-1}(cx)\right)^2}{x}+e^2x\left(a+b\tan^{-1}(cx\right.\right.$$

$$= d^2\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx+(2de)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx+e^2\int x\left(a\right.$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\tan^{-1}(cx)\right)^2+4de\left(a+b\tan^{-1}(cx\right.$$

$$= -\frac{d^2\left(a+b\tan^{-1}(cx)\right)^2}{2x^2}+\frac{1}{2}e^2x^2\left(a+b\tan^{-1}(cx)\right)^2+4de\left(a+b\tan^{-1}(cx\right.$$

$$= -\frac{abe^2x}{c}-\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d^2\left(a+b\tan^{-1}(cx)\right)^2+\frac{e^2\left(a+b\right.}{}$$

$$= -\frac{abe^2x}{c}-\frac{b^2e^2x\tan^{-1}(cx)}{c}-\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d^2\left(a+b\tan^{-}\right.$$

$$= -\frac{abe^2x}{c}-\frac{b^2e^2x\tan^{-1}(cx)}{c}-\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d^2\left(a+b\tan^{-}\right.$$

$$= -\frac{abe^2x}{c}-\frac{b^2e^2x\tan^{-1}(cx)}{c}-\frac{bcd^2\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{1}{2}c^2d^2\left(a+b\tan^{-}\right.$$

Mathematica [A] time = 0.64, size = 367, normalized size = 1.15

$$\frac{1}{2}\left(-\frac{a^2d^2}{x^2}+4a^2de\log(x)+a^2e^2x^2+\frac{2abe^2\left(\left(c^2x^2+1\right)\tan^{-1}(cx)-cx\right)}{c^2}-\frac{2abd^2\left(\tan^{-1}(cx)+cx\left(cx\tan^{-1}(cx)\right.\right.}{x^2}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((d + e*x^2)^2*(a + b*ArcTan[c*x])^2)/x^3,x]
```

```
[Out] (-((a^2*d^2)/x^2) + a^2*e^2*x^2 + (2*a*b*e^2*(-(c*x) + (1 + c^2*x^2)*ArcTan
[c*x]))/c^2 - (2*a*b*d^2*(ArcTan[c*x] + c*x*(1 + c*x*ArcTan[c*x])))/x^2 + 4
*a^2*d*e*Log[x] - (b^2*d^2*(2*c*x*ArcTan[c*x] + (1 + c^2*x^2)*ArcTan[c*x]^2
 - 2*c^2*x^2*Log[(c*x)/Sqrt[1 + c^2*x^2]]))/x^2 + (b^2*e^2*(-2*c*x*ArcTan[c
```

```
*x] + (1 + c^2*x^2)*ArcTan[c*x]^2 + Log[1 + c^2*x^2]))/c^2 + (4*I)*a*b*d*e*
(PolyLog[2, (-I)*c*x] - PolyLog[2, I*c*x]) + (b^2*d*e*((-I)*Pi^3 + (16*I)*A
rcTan[c*x]^3 + 24*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 24*ArcTan
[c*x]^2*Log[1 + E^((2*I)*ArcTan[c*x])] + (24*I)*ArcTan[c*x]*PolyLog[2, E^((
-2*I)*ArcTan[c*x])] + (24*I)*ArcTan[c*x]*PolyLog[2, -E^((2*I)*ArcTan[c*x])]
 + 12*PolyLog[3, E^((-2*I)*ArcTan[c*x])] - 12*PolyLog[3, -E^((2*I)*ArcTan[c
*x])]))/6)/2
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{a^2e^2x^4 + 2\,a^2dex^2 + a^2d^2 + \left(b^2e^2x^4 + 2\,b^2dex^2 + b^2d^2\right)\arctan\left(cx\right)^2 + 2\left(abe^2x^4 + 2\,abdex^2 + abd^2\right)\text{arc}}{x^3}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^3,x, algorithm="fricas")
```

```
[Out] integral((a^2*e^2*x^4 + 2*a^2*d*e*x^2 + a^2*d^2 + (b^2*e^2*x^4 + 2*b^2*d*e*
x^2 + b^2*d^2)*arctan(c*x)^2 + 2*(a*b*e^2*x^4 + 2*a*b*d*e*x^2 + a*b*d^2)*ar
ctan(c*x))/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 6.78, size = 1511, normalized size = 4.72

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^3,x)
```

```
[Out] -1/2*d^2*a^2/x^2+I*b^2*e*d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I/((
1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/
(c^2*x^2+1)+1))*arctan(c*x)^2-1/2*c^2*d^2*b^2*arctan(c*x)^2-1/2*d^2*b^2/x^2
*arctan(c*x)^2-c*d^2*a*b/x-d^2*a*b*arctan(c*x)/x^2-c^2*d^2*a*b*arctan(c*x)-
c*d^2*b^2*arctan(c*x)/x+I*b^2*e*d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1
+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+I*b^2*e*d*Pi*csgn(((1+I*c*x)^2/(c
^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^3*arctan(c*x)^2+2*I*a*b*e*d*ln(c*
x)*ln(1+I*c*x)-2*I*a*b*e*d*ln(c*x)*ln(1-I*c*x)-I*b^2*e*d*Pi*csgn(((1+I*c*x)
^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-I*c^2*b^2*ar
ctan(c*x)*d^2+I/c^2*b^2*arctan(c*x)*e^2+1/c^2*a*b*arctan(c*x)*e^2+2*b^2*arc
tan(c*x)^2*e*d*ln(c*x)+2*b^2*e*d*arctan(c*x)^2*ln(1+(1+I*c*x)/(c^2*x^2+1)^(
1/2))+2*b^2*e*d*arctan(c*x)^2*ln(1-(1+I*c*x)/(c^2*x^2+1)^(1/2))+a*b*arctan(
c*x)*x^2*e^2-2*b^2*e*d*arctan(c*x)^2*ln((1+I*c*x)^2/(c^2*x^2+1)-1)-b^2*e*d*
polylog(3,-(1+I*c*x)^2/(c^2*x^2+1))+4*b^2*e*d*polylog(3,-(1+I*c*x)/(c^2*x^2
+1)^(1/2))+I*b^2*e*d*Pi*arctan(c*x)^2+4*a*b*arctan(c*x)*e*d*ln(c*x)+2*I*a*b
*e*d*dilog(1+I*c*x)-2*I*a*b*e*d*dilog(1-I*c*x)+2*I*b^2*e*d*arctan(c*x)*poly
log(2,-(1+I*c*x)^2/(c^2*x^2+1))-4*I*b^2*e*d*arctan(c*x)*polylog(2,(1+I*c*x)
/(c^2*x^2+1)^(1/2))-4*I*b^2*e*d*arctan(c*x)*polylog(2,-(1+I*c*x)/(c^2*x^2+1
)^(1/2))+4*b^2*e*d*polylog(3,(1+I*c*x)/(c^2*x^2+1)^(1/2))+1/2*b^2*arctan(c*
x)^2*x^2*e^2+1/2/c^2*b^2*arctan(c*x)^2*e^2-1/c^2*b^2*e^2*ln((1+I*c*x)^2/(c^
2*x^2+1)+1)+c^2*b^2*d^2*ln((1+I*c*x)/(c^2*x^2+1)^(1/2)-1)+c^2*b^2*d^2*ln(1+
(1+I*c*x)/(c^2*x^2+1)^(1/2))+2*a^2*e*d*ln(c*x)+1/2*a^2*x^2*e^2+I*b^2*e*d*Pi
*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((1+I
```

```
*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*arctan(c*x)^2-I*b^2*e*d
*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(((
1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-I*b^
2*e*d*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1
)-1)/((1+I*c*x)^2/(c^2*x^2+1)+1))^2*arctan(c*x)^2-I*b^2*e*d*Pi*csgn(I/((1+I
*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)-1)/((1+I*c*x)^2/(c^
2*x^2+1)+1))^2*arctan(c*x)^2-a*b*e^2*x/c-b^2*e^2*x*arctan(c*x)/c
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x^2+d)^2*(a+b*arctan(c*x))^2/x^3,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*e^2*x^2 - ((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*a*b*d^2 + 2*a
^2*d*e*log(x) - 1/2*a^2*d^2/x^2 + 1/96*((1152*b^2*c^2*e^2*integrate(1/16*x^
6*arctan(c*x)^2/(c^2*x^5 + x^3), x) + 96*b^2*c^2*e^2*integrate(1/16*x^6*log
(c^2*x^2 + 1)^2/(c^2*x^5 + x^3), x) + 3072*a*b*c^2*e^2*integrate(1/16*x^6*a
rctan(c*x)/(c^2*x^5 + x^3), x) + 192*b^2*c^2*e^2*integrate(1/16*x^6*log(c^2
*x^2 + 1)/(c^2*x^5 + x^3), x) + 2304*b^2*c^2*d*e*integrate(1/16*x^4*arctan(
c*x)^2/(c^2*x^5 + x^3), x) + 6144*a*b*c^2*d*e*integrate(1/16*x^4*arctan(c*x
)/(c^2*x^5 + x^3), x) + 1152*b^2*c^2*d^2*integrate(1/16*x^2*arctan(c*x)^2/(
c^2*x^5 + x^3), x) + 96*b^2*c^2*d^2*integrate(1/16*x^2*log(c^2*x^2 + 1)^2/(
c^2*x^5 + x^3), x) - 192*b^2*c^2*d^2*integrate(1/16*x^2*log(c^2*x^2 + 1)/(c
^2*x^5 + x^3), x) + 2*b^2*d*e*log(c^2*x^2 + 1)^3 - 384*b^2*c*e^2*integrate(
1/16*x^5*arctan(c*x)/(c^2*x^5 + x^3), x) + 384*b^2*c*d^2*integrate(1/16*x*a
rctan(c*x)/(c^2*x^5 + x^3), x) + 1152*b^2*e^2*integrate(1/16*x^4*arctan(c*x
)^2/(c^2*x^5 + x^3), x) + 3072*a*b*e^2*integrate(1/16*x^4*arctan(c*x)/(c^2*
x^5 + x^3), x) + 2304*b^2*d*e*integrate(1/16*x^2*arctan(c*x)^2/(c^2*x^5 + x
^3), x) + 192*b^2*d*e*integrate(1/16*x^2*log(c^2*x^2 + 1)^2/(c^2*x^5 + x^3)
, x) + 6144*a*b*d*e*integrate(1/16*x^2*arctan(c*x)/(c^2*x^5 + x^3), x) + 11
52*b^2*d^2*integrate(1/16*arctan(c*x)^2/(c^2*x^5 + x^3), x) + 96*b^2*d^2*in
tegrate(1/16*log(c^2*x^2 + 1)^2/(c^2*x^5 + x^3), x) + b^2*e^2*log(c^2*x^2 +
 1)^3/c^2)*x^2 + 12*(b^2*e^2*x^4 - b^2*d^2)*arctan(c*x)^2 - 3*(b^2*e^2*x^4
- b^2*d^2)*log(c^2*x^2 + 1)^2)/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(c\,x))^2\,\left(e\,x^2+d\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))^2*(d + e*x^2)^2)/x^3,x)
```

```
[Out] int(((a + b*atan(c*x))^2*(d + e*x^2)^2)/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{atan}\,(cx))^2\left(d+ex^2\right)^2}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((e*x**2+d)**2*(a+b*atan(c*x))**2/x**3,x)
```

```
[Out] Integral((a + b*atan(c*x))**2*(d + e*x**2)**2/x**3, x)
```

3.1261 $\int \frac{x^3(a+b\tan^{-1}(cx))^2}{d+ex^2}\,dx$

Optimal. Leaf size=590

$$\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e}-\frac{ibd\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^2}+\frac{ibd\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2e^2}+\frac{ibd\left(a\right.}{}$$

```
[Out] -a*b*x/c/e-b^2*x*arctan(c*x)/c/e+1/2*(a+b*arctan(c*x))^2/c^2/e+1/2*x^2*(a+b
*arctan(c*x))^2/e+d*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/e^2+1/2*b^2*ln(c^2*
x^2+1)/c^2/e-1/2*d*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c
*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2-1/2*d*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1
/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2-I*b*d*(a+b*arctan(c*
x))*polylog(2,1-2/(1-I*c*x))/e^2+1/2*I*b*d*(a+b*arctan(c*x))*polylog(2,1-2*
c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2+1/2*I*b*d*
(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^
(1/2)+I*e^(1/2)))/e^2+1/2*b^2*d*polylog(3,1-2/(1-I*c*x))/e^2-1/4*b^2*d*poly
log(3,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2-
1/4*b^2*d*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*
e^(1/2)))/e^2
```

Rubi [A] time = 0.50, antiderivative size = 590, normalized size of antiderivative = 1.00, number of steps used = 11, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4916, 4852, 4846, 260, 4884, 4980, 4858}

$$-\frac{ibd\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{e^2}+\frac{ibd\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2e^2}+\frac{ibd\left(a+b\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x])^2)/(d + e*x^2),x]
```

```
[Out] -((a*b*x)/(c*e)) - (b^2*x*ArcTan[c*x])/(c*e) + (a + b*ArcTan[c*x])^2/(2*c^2
*e) + (x^2*(a + b*ArcTan[c*x])^2)/(2*e) + (d*(a + b*ArcTan[c*x])^2*Log[2/(1
 - I*c*x)])/e^2 - (d*(a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))
/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*e^2) - (d*(a + b*ArcTan[c*x])^
2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])
/(2*e^2) + (b^2*Log[1 + c^2*x^2])/(2*c^2*e) - (I*b*d*(a + b*ArcTan[c*x])*Po
lyLog[2, 1 - 2/(1 - I*c*x)])/e^2 + ((I/2)*b*d*(a + b*ArcTan[c*x])*PolyLog[2
, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])
/e^2 + ((I/2)*b*d*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[
e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/e^2 + (b^2*d*PolyLog[3, 1 -
 2/(1 - I*c*x)])/(2*e^2) - (b^2*d*PolyLog[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x
))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(4*e^2) - (b^2*d*PolyLog[3, 1 -
 (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*e
^2)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx = \frac{\int x\left(a+b\tan^{-1}(cx)\right)^2 dx}{e} - \frac{d\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}dx}{e}$$

$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2e} - \frac{(bc)\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}dx}{e} - \frac{d\int\left(-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)} + \frac{\left(a+b\tan^{-1}(\right.}{2\sqrt{e}\left(\sqrt{-d}+\right.}\right.}{e}$$

$$= \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2e} + \frac{d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}-\sqrt{e}x}dx}{2e^{3/2}} - \frac{d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}+\sqrt{e}x}dx}{2e^{3/2}} - \frac{b\int\left(a+b\,\mathrm{ta}\right.}{c}$$

$$= -\frac{abx}{ce} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2e} + \frac{d\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-ic}\right.}{e^2}$$

$$= -\frac{abx}{ce} - \frac{b^2x\tan^{-1}(cx)}{ce} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2e} + \frac{d\left(a+b\tan\right.}{}$$

$$= -\frac{abx}{ce} - \frac{b^2x\tan^{-1}(cx)}{ce} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2c^2e} + \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{2e} + \frac{d\left(a+b\tan\right.}{}$$

Mathematica [B] time = 10.89, size = 1569, normalized size = 2.66

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x])^2)/(d + e*x^2),x]
```

```
[Out] (2*a^2*e*x^2 - 2*a^2*d*Log[d + e*x^2] + 4*a*b*(-((e*x)/c) - I*d*ArcTan[c*x]
^2 + ArcTan[c*x]*(e*(c^(-2) + x^2) + 2*d*Log[1 + E^((2*I)*ArcTan[c*x])]) -
I*d*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + (2*d*(-(c^2*d) + e)*((-I)*ArcTan[c
*x]^2 + (2*I)*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[(c*e*x)/Sqrt[c^2*d*e
]] + (-ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]] + ArcTan[c*x])*Log[1 + ((c^2*d + e
 + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + (ArcSin[Sqrt[(c^2
*d)/(c^2*d - e)]] + ArcTan[c*x])*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]
) + e*(-1 + E^((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^
2*d - e)] - (I/2)*(PolyLog[2, ((-(c^2*d) - e + 2*Sqrt[c^2*d*e])*E^((2*I)*Ar
cTan[c*x]))/(c^2*d - e)] + PolyLog[2, -(((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((
2*I)*ArcTan[c*x]))/(c^2*d - e))])))/(2*c^2*d - 2*e)) + (b^2*(-4*c*e*x*ArcTa
n[c*x] + 2*e*ArcTan[c*x]^2 + 2*c^2*e*x^2*ArcTan[c*x]^2 + 4*c^2*d*ArcTan[c*x
]^2*Log[1 + E^((2*I)*ArcTan[c*x])] - 2*c^2*d*ArcTan[c*x]^2*Log[1 + ((c*Sqrt
[d] - Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] + Sqrt[e])] - 2*c^2*d*ArcT
an[c*x]^2*Log[1 + ((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d]
- Sqrt[e])] + 2*c^2*d*ArcTan[c*x]^2*Log[1 + ((c^2*d + e - 2*Sqrt[c^2*d*e])*
E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + 4*c^2*d*ArcSin[Sqrt[(c^2*d)/(c^2*d -
e)]]*ArcTan[c*x]*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x
]))/(c^2*d - e)] - 2*c^2*d*ArcTan[c*x]^2*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d
*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] - 4*c^2*d*ArcSin[Sqrt[(c^2*d)/(c^2
*d - e)]]*ArcTan[c*x]*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 +
 E^((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] -
 4*c^2*d*ArcTan[c*x]^2*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1
+ E^((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)]
+ 4*c^2*d*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[c*x]*Log[((2*I)*c^2*d -
(2*I)*Sqrt[c^2*d*e] + 2*c*(-e + Sqrt[c^2*d*e])*x)/((c^2*d - e)*(I + c*x))]
+ 2*c^2*d*ArcTan[c*x]^2*Log[((2*I)*c^2*d - (2*I)*Sqrt[c^2*d*e] + 2*c*(-e +
Sqrt[c^2*d*e])*x)/((c^2*d - e)*(I + c*x))] + 2*e*Log[1 + c^2*x^2] - 4*c^2*d
```

```
*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[c*x]*Log[1 + ((c^2*d + e + 2*Sqrt
[c^2*d*e])*(Cos[2*ArcTan[c*x]] + I*Sin[2*ArcTan[c*x]]))/(c^2*d - e)] + 2*c^
2*d*ArcTan[c*x]^2*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*(Cos[2*ArcTan[c*x]
] + I*Sin[2*ArcTan[c*x]]))/(c^2*d - e)] - (4*I)*c^2*d*ArcTan[c*x]*PolyLog[2
, -E^((2*I)*ArcTan[c*x])] + (2*I)*c^2*d*ArcTan[c*x]*PolyLog[2, ((-(c*Sqrt[d
]) + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] + Sqrt[e])] + (2*I)*c^2*d*A
rcTan[c*x]*PolyLog[2, -(((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sq
rt[d] - Sqrt[e]))] + 2*c^2*d*PolyLog[3, -E^((2*I)*ArcTan[c*x])] - c^2*d*Pol
yLog[3, ((-(c*Sqrt[d]) + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] + Sqrt[
e])] - c^2*d*PolyLog[3, -(((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*
Sqrt[d] - Sqrt[e]))]))/c^2)/(4*e^2)
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^3\arctan\left(cx\right)^2+2\,abx^3\arctan\left(cx\right)+a^2x^3}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x^3*arctan(c*x)^2 + 2*a*b*x^3*arctan(c*x) + a^2*x^3)/(e*x^2 +
 d), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 56.82, size = 0, normalized size = 0.00

$$\int\frac{x^3\left(a+b\arctan\left(cx\right)\right)^2}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))^2/(e*x^2+d),x)
```

```
[Out] int(x^3*(a+b*arctan(c*x))^2/(e*x^2+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^2\left(\frac{x^2}{e}-\frac{d\log\left(ex^2+d\right)}{e^2}\right)+\int\frac{b^2x^3\arctan\left(cx\right)^2+2\,abx^3\arctan\left(cx\right)}{ex^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(x^2/e - d*log(e*x^2 + d)/e^2) + integrate((b^2*x^3*arctan(c*x)^2 +
 2*a*b*x^3*arctan(c*x))/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{x^3\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x))^2)/(d + e*x^2),x)
```

```
[Out] int((x^3*(a + b*atan(c*x))^2)/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^3 (a + b \operatorname{atan}(cx))^2}{d + ex^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))**2/(e*x**2+d),x)
```

```
[Out] Integral(x**3*(a + b*atan(c*x))**2/(d + e*x**2), x)
```

3.1262 $\int \frac{x^2(a+b\tan^{-1}(cx))^2}{d+ex^2}\,dx$

Optimal. Leaf size=554

$$-\frac{ib\sqrt{-d}\,\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2e^{3/2}}+\frac{ib\sqrt{-d}\,\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{e}\,x+\sqrt{-d}\right)}{\left(\sqrt{-d}\,c+i\sqrt{e}\right)(1-icx)}\right)}{2e^{3/2}}+\sqrt{-}$$

```
[Out] I*(a+b*arctan(c*x))^2/c/e+x*(a+b*arctan(c*x))^2/e+2*b*(a+b*arctan(c*x))*ln(
2/(1+I*c*x))/c/e+I*b^2*polylog(2,1-2/(1+I*c*x))/c/e+1/2*(a+b*arctan(c*x))^2
*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))*(-d)^(1/
2)/e^(3/2)-1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/
(c*(-d)^(1/2)+I*e^(1/2)))*(-d)^(1/2)/e^(3/2)-1/2*I*b*(a+b*arctan(c*x))*poly
log(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))*(-d)
^(1/2)/e^(3/2)+1/2*I*b*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1
/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*(-d)^(1/2)/e^(3/2)+1/4*b^2*polylog
(3,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))*(-d)^(1
/2)/e^(3/2)-1/4*b^2*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d
)^(1/2)+I*e^(1/2)))*(-d)^(1/2)/e^(3/2)
```

Rubi [A] time = 0.48, antiderivative size = 554, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {4916, 4846, 4920, 4854, 2402, 2315, 4914, 4858}

$$-\frac{ib\sqrt{-d}\,\left(a+b\tan^{-1}(cx)\right)\mathrm{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2e^{3/2}}+\frac{ib\sqrt{-d}\,\left(a+b\tan^{-1}(cx)\right)\mathrm{PolyLog}\left(2,1-\frac{2c(\sqrt{}}{(1-icx)(}\right.}{2e^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x])^2)/(d + e*x^2),x]
```

```
[Out] (I*(a + b*ArcTan[c*x])^2)/(c*e) + (x*(a + b*ArcTan[c*x])^2)/e + (2*b*(a + b
*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(c*e) + (Sqrt[-d]*(a + b*ArcTan[c*x])^2*L
og[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2
*e^(3/2)) - (Sqrt[-d]*(a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x)
)/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*e^(3/2)) + (I*b^2*PolyLog[2,
1 - 2/(1 + I*c*x)])/(c*e) - ((I/2)*b*Sqrt[-d]*(a + b*ArcTan[c*x])*PolyLog[2
, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])
/e^(3/2) + ((I/2)*b*Sqrt[-d]*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[
-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/e^(3/2) + (b^2*S
qrt[-d]*PolyLog[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e
])*(1 - I*c*x))])/(4*e^(3/2)) - (b^2*Sqrt[-d]*PolyLog[3, 1 - (2*c*(Sqrt[-d]
 + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*e^(3/2))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
```

```
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rubi steps

$$\int \frac{x^2\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx = \frac{\int \left(a+b\tan^{-1}(cx)\right)^2 dx}{e} - \frac{d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}dx}{e}$$

$$= \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} - \frac{(2bc)\int \frac{x\left(a+b\tan^{-1}(cx)\right)}{1+c^2x^2}dx}{e} - \frac{d\int \left(\frac{\sqrt{-d}\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\sqrt{-d}\,(}{2d(}\right.}{e}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{(2b)\int \frac{a+b\tan^{-1}(cx)}{i-cx}dx}{e} - \frac{\sqrt{-d}\int \frac{(a+}{}}{}$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{2b\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{ce} +$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{2b\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{ce} +$$

$$= \frac{i\left(a+b\tan^{-1}(cx)\right)^2}{ce} + \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e} + \frac{2b\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{ce} +$$

Mathematica [F] time = 180.00, size = 0, normalized size = 0.00

$Aborted

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x])^2)/(d + e*x^2),x]
```

```
[Out] $Aborted
```

fricas [F] time = 0.44, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^2\arctan(cx)^2 + 2\,abx^2\arctan(cx) + a^2x^2}{ex^2+d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*arctan(c*x)^2 + 2*a*b*x^2*arctan(c*x) + a^2*x^2)/(e*x^2 +
 d), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 6.46, size = 0, normalized size = 0.00

$$\int \frac{x^2\left(a+b\arctan(cx)\right)^2}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))^2/(e*x^2+d),x)
```

```
[Out] int(x^2*(a+b*arctan(c*x))^2/(e*x^2+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\frac{d\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,e}-\frac{x}{e}\right)+\frac{4\,b^2x\arctan\left(cx\right)^2-b^2x\log\left(c^2x^2+1\right)^2+e\int\frac{12\left(b^2c^2ex^4+b^2ex^2\right)\arctan(cx)^2+\left(b^2c^2ex^4+b^2ex^2\right)\log}{}}{16\,e}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -a^2*(d*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e) - x/e) + 1/16*(4*b^2*x*arctan(c
*x)^2 - b^2*x*log(c^2*x^2 + 1)^2 + 16*e*integrate(1/16*(12*(b^2*c^2*e*x^4 +
 b^2*e*x^2)*arctan(c*x)^2 + (b^2*c^2*e*x^4 + b^2*e*x^2)*log(c^2*x^2 + 1)^2
+ 8*(4*a*b*c^2*e*x^4 - b^2*c*e*x^3 - b^2*c*d*x + 4*a*b*e*x^2)*arctan(c*x) +
 4*(b^2*c^2*e*x^4 + b^2*c^2*d*x^2)*log(c^2*x^2 + 1))/(c^2*e^2*x^4 + (c^2*d*
e + e^2)*x^2 + d*e), x))/e
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{e\,x^2+d} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x))^2)/(d + e*x^2),x)
```

```
[Out] int((x^2*(a + b*atan(c*x))^2)/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x^{2} \left(a + b \operatorname{atan}{\left(cx \right)}\right)^{2}}{d + ex^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))**2/(e*x**2+d),x)
```

```
[Out] Integral(x**2*(a + b*atan(c*x))**2/(d + e*x**2), x)
```

3.1263 $\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx$

Optimal. Leaf size=492

$$-\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2e}-\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c\left(\sqrt{e}x+\sqrt{-d}\right)}{\left(\sqrt{-d}c+i\sqrt{e}\right)(1-icx)}\right)}{2e}+\frac{\left(a+b\tan^{-1}(\right.}{}$$

```
[Out] -(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/e+1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)
^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e+1/2*(a+b*arctan(c*x
))^2*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e+I*
b*(a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/e-1/2*I*b*(a+b*arctan(c*x))*po
lylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e-
1/2*I*b*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/
(c*(-d)^(1/2)+I*e^(1/2)))/e-1/2*b^2*polylog(3,1-2/(1-I*c*x))/e+1/4*b^2*poly
log(3,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e+1/
4*b^2*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1
/2)))/e
```

Rubi [A] time = 0.25, antiderivative size = 492, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.095, Rules used = {4980, 4858}

$$-\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2e}-\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right.}{2e}$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x])^2)/(d + e*x^2),x]
```

```
[Out] -(((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e) + ((a + b*ArcTan[c*x])^2*Lo
g[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*
e) + ((a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] +
 I*Sqrt[e])*(1 - I*c*x))])/(2*e) + (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 -
2/(1 - I*c*x)])/e - ((I/2)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[
-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/e - ((I/2)*b*(a
+ b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] +
 I*Sqrt[e])*(1 - I*c*x))])/e - (b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e) +
(b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*
(1 - I*c*x))])/(4*e) + (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c
*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*e)
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
```

```
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx = \int\left(-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx$$
$$= -\frac{\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2\sqrt{e}}+\frac{\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2\sqrt{e}}$$
$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e}+\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2e}+\frac{\left(a+b\right.}{}$$

Mathematica [B] time = 9.28, size = 1529, normalized size = 3.11

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x])^2)/(d + e*x^2),x]
```

```
[Out] ((8*I)*a*b*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[(c*e*x)/Sqrt[c^2*d*e]]
- 8*a*b*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - 4*b^2*ArcTan[c*x]^2*Lo
g[1 + E^((2*I)*ArcTan[c*x])] + 2*b^2*ArcTan[c*x]^2*Log[1 + ((c*Sqrt[d] - Sq
rt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] + Sqrt[e])] + 2*b^2*ArcTan[c*x]^2*
Log[1 + ((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] - Sqrt[e])
] - 2*b^2*ArcTan[c*x]^2*Log[1 + ((c^2*d + e - 2*Sqrt[c^2*d*e])*E^((2*I)*Arc
Tan[c*x]))/(c^2*d - e)] - 4*a*b*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*Log[1 + (
(c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + 4*a*b*A
rcTan[c*x]*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c
^2*d - e)] - 4*b^2*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[c*x]*Log[1 + ((
c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + 2*b^2*Ar
cTan[c*x]^2*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(
c^2*d - e)] + 4*a*b*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*Log[(-2*Sqrt[c^2*d*e]
*E^((2*I)*ArcTan[c*x]) + e*(-1 + E^((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*
I)*ArcTan[c*x])))/(c^2*d - e)] + 4*a*b*ArcTan[c*x]*Log[(-2*Sqrt[c^2*d*e]*E^
((2*I)*ArcTan[c*x]) + e*(-1 + E^((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*
ArcTan[c*x])))/(c^2*d - e)] + 4*b^2*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTa
n[c*x]*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 + E^((2*I)*ArcTa
n[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] + 4*b^2*ArcTan[c
*x]^2*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 + E^((2*I)*ArcTan
[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] - 4*b^2*ArcSin[Sq
rt[(c^2*d)/(c^2*d - e)]]*ArcTan[c*x]*Log[((2*I)*c^2*d - (2*I)*Sqrt[c^2*d*e]
 + 2*c*(-e + Sqrt[c^2*d*e])*x)/((c^2*d - e)*(I + c*x))] - 2*b^2*ArcTan[c*x]
^2*Log[((2*I)*c^2*d - (2*I)*Sqrt[c^2*d*e] + 2*c*(-e + Sqrt[c^2*d*e])*x)/((c
^2*d - e)*(I + c*x))] + 2*a^2*Log[d + e*x^2] + 4*b^2*ArcSin[Sqrt[(c^2*d)/(c
^2*d - e)]]*ArcTan[c*x]*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*(Cos[2*ArcTa
n[c*x]] + I*Sin[2*ArcTan[c*x]]))/(c^2*d - e)] - 2*b^2*ArcTan[c*x]^2*Log[1 +
 ((c^2*d + e + 2*Sqrt[c^2*d*e])*(Cos[2*ArcTan[c*x]] + I*Sin[2*ArcTan[c*x]])
)/(c^2*d - e)] + (4*I)*b*(a + b*ArcTan[c*x])*PolyLog[2, -E^((2*I)*ArcTan[c*
x])] - (2*I)*b^2*ArcTan[c*x]*PolyLog[2, ((-(c*Sqrt[d]) + Sqrt[e])*E^((2*I)*
ArcTan[c*x]))/(c*Sqrt[d] + Sqrt[e])] - (2*I)*b^2*ArcTan[c*x]*PolyLog[2, -((
(c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] - Sqrt[e]))] - (2*I
)*a*b*PolyLog[2, ((-(c^2*d) - e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(
```

```
c^2*d - e)] - (2*I)*a*b*PolyLog[2, -(((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I
)*ArcTan[c*x]))/(c^2*d - e))] - 2*b^2*PolyLog[3, -E^((2*I)*ArcTan[c*x])] +
b^2*PolyLog[3, ((-(c*Sqrt[d]) + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d]
+ Sqrt[e])] + b^2*PolyLog[3, -(((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x])
)/(c*Sqrt[d] - Sqrt[e]))])/(4*e)
```

fricas [F] time = 0.48, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x\arctan(cx)^2 + 2\,abx\arctan(cx) + a^2x}{ex^2 + d}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*x*arctan(c*x)^2 + 2*a*b*x*arctan(c*x) + a^2*x)/(e*x^2 + d), x
)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 19.69, size = 0, normalized size = 0.00

$$\int \frac{x\,(a + b\arctan(cx))^2}{e\,x^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))^2/(e*x^2+d),x)
```

```
[Out] int(x*(a+b*arctan(c*x))^2/(e*x^2+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^2\log\left(ex^2 + d\right)}{2\,e} + \int \frac{b^2x\arctan(cx)^2 + 2\,abx\arctan(cx)}{ex^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*log(e*x^2 + d)/e + integrate((b^2*x*arctan(c*x)^2 + 2*a*b*x*arctan(
c*x))/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,(a + b\,\mathrm{atan}(c\,x))^2}{e\,x^2 + d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x))^2)/(d + e*x^2),x)
```

```
[Out] int((x*(a + b*atan(c*x))^2)/(d + e*x^2), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(cx))^2}{d+ex^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))**2/(e*x**2+d),x)
```

```
[Out] Integral(x*(a + b*atan(c*x))**2/(d + e*x**2), x)
```

3.1264 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx$

Optimal. Leaf size=460

$$-\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{e}x+\sqrt{-d}\right)}{\left(\sqrt{-d}c+i\sqrt{e}\right)(1-icx)}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{\left(a+b\tan^{-1}(\right.}{}$$

```
[Out] 1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/
2)-I*e^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2
)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(1/2)/e^(1/2)-1/2*I*b
*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)
^(1/2)-I*e^(1/2)))/(-d)^(1/2)/e^(1/2)+1/2*I*b*(a+b*arctan(c*x))*polylog(2,1
-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(1/2)/
e^(1/2)+1/4*b^2*polylog(3,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1
/2)-I*e^(1/2)))/(-d)^(1/2)/e^(1/2)-1/4*b^2*polylog(3,1-2*c*((-d)^(1/2)+x*e^
(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(1/2)/e^(1/2)
```

Rubi [A] time = 0.25, antiderivative size = 460, normalized size of antiderivative = 1.00, number of steps used = 4, number of rules used = 2, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.100, Rules used = {4914, 4858}

$$-\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2\sqrt{-d}\sqrt{e}}+\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right.}{2\sqrt{-d}\sqrt{e}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(d + e*x^2),x]
```

```
[Out] ((a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sq
rt[e])*(1 - I*c*x))])/(2*Sqrt[-d]*Sqrt[e]) - ((a + b*ArcTan[c*x])^2*Log[(2*
c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*Sqrt[
-d]*Sqrt[e]) - ((I/2)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] -
 Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(Sqrt[-d]*Sqrt[e]) +
((I/2)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((
c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(Sqrt[-d]*Sqrt[e]) + (b^2*PolyLog[3,
 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/
(4*Sqrt[-d]*Sqrt[e]) - (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c
*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*Sqrt[-d]*Sqrt[e])
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rubi steps

$$
\begin{aligned}
\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx &= \int \left(\frac{\sqrt{-d}\,\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\sqrt{-d}\,\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx\\
&= -\frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}-\sqrt{e}\,x}\,dx}{2\sqrt{-d}}-\frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}+\sqrt{e}\,x}\,dx}{2\sqrt{-d}}\\
&= \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2\sqrt{-d}\,\sqrt{e}}-\frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{\left(c\sqrt{-d}+i\sqrt{e}\right)(1-icx)}\right)}{2\sqrt{-d}\,\sqrt{e}}
\end{aligned}
$$

Mathematica [F] time = 160.30, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(d + e*x^2),x]
[Out] Integrate[(a + b*ArcTan[c*x])^2/(d + e*x^2), x]
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\arctan(cx)^2+2\,ab\arctan(cx)+a^2}{ex^2+d},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x^2 + d), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="giac")
[Out] Timed out
```

maple [B] time = 0.77, size = 2600, normalized size = 5.65

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/(e*x^2+d),x)
[Out] -2*I*c*b^2*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^
(1/2)-e))/(2*c^4*d^2-4*c^2*d*e+2*e^2)*(c^2*e*d)^(1/2)-1/2*I*c^3*b^2*polylog
(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))/(c^4*d^2
-2*c^2*d*e+e^2)*d+1/2*I*c*b^2*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(
-c^2*d-2*(c^2*e*d)^(1/2)-e))/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)-1/2*I*
c*b^2*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)
```

```
-e))/(c^4*d^2-2*c^2*d*e+e^2)*e+I*c^3*b^2*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c
^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))/(2*c^4*d^2-4*c^2*d*e+2*e^2)*d+I*c*b
^2*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e)
)/(2*c^4*d^2-4*c^2*d*e+2*e^2)*e-2*c*a*b/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)
^2*(c^2*e*d)^(1/2)-c*a*b/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c
*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*(c^2*e*d)^(1/2)-1/3/c*b^2*(
c^2*e*d)^(1/2)/e/d*arctan(c*x)^3-c*b^2/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c
^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)*(
c^2*e*d)^(1/2)+1/2*I*c^3*b^2*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d
-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)^2/e/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1
/2)*d+1/2*I/c*b^2*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d
)^(1/2)-e))*arctan(c*x)^2/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*e-I/c*a
*b*(c^2*e*d)^(1/2)/e/d*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(
-c^2*d+2*(c^2*e*d)^(1/2)-e))+I*c^3*a*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+
1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/e/(c^4*d^2-2*c^2*d*e+e^2)*(c^2
*e*d)^(1/2)*d+I/c*a*b*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2
*e*d)^(1/2)-e))*arctan(c*x)/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*e-2/3
*c*b^2/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^3*(c^2*e*d)^(1/2)+1/3*c^3*b^2/e/
(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^3*(c^2*e*d)^(1/2)*d+1/3/c*b^2/d/(c^4*d^
2-2*c^2*d*e+e^2)*arctan(c*x)^3*(c^2*e*d)^(1/2)*e-1/c*a*b*(c^2*e*d)^(1/2)/e/
d*arctan(c*x)^2-1/2/c*a*b*(c^2*e*d)^(1/2)/e/d*polylog(2,(c^2*d-e)*(1+I*c*x)
^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))-1/2/c*b^2*(c^2*e*d)^(1/2)/e/d*
arctan(c*x)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)
^(1/2)-e))-I*c*b^2*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*
d)^(1/2)-e))*arctan(c*x)^2/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)-1/4*I/c*
b^2*(c^2*e*d)^(1/2)/e/d*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d
+2*(c^2*e*d)^(1/2)-e))+a^2/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+1/2/c*a*b/d/
(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d
-2*(c^2*e*d)^(1/2)-e))*(c^2*e*d)^(1/2)*e+1/c*a*b/d/(c^4*d^2-2*c^2*d*e+e^2)*
arctan(c*x)^2*(c^2*e*d)^(1/2)*e+1/2*c^3*a*b/e/(c^4*d^2-2*c^2*d*e+e^2)*polyl
og(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*(c^2*e
*d)^(1/2)*d+c^3*a*b/e/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^2*(c^2*e*d)^(1/2)
*d+1/2/c*b^2/d/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2
*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)*(c^2*e*d)^(1/2)*e+1/2*c^3
*b^2/e/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/
(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)*(c^2*e*d)^(1/2)*d-1/2*I/c*b^2*(c^
2*e*d)^(1/2)/e/d*arctan(c*x)^2*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2
*d+2*(c^2*e*d)^(1/2)-e))+1/4*I/c*b^2*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x
^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/
2)*e+1/4*I*c^3*b^2*polylog(3,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c
^2*e*d)^(1/2)-e))/e/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*d-2*I*c*a*b*ln(
1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*
x)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{a^2\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}}+\int\frac{12\,b^2\arctan(cx)^2+b^2\log\left(c^2x^2+1\right)^2+32\,ab\arctan(cx)}{16\left(ex^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] a^2*arctan(e*x/sqrt(d*e))/sqrt(d*e) + integrate(1/16*(12*b^2*arctan(c*x)^2
+ b^2*log(c^2*x^2 + 1)^2 + 32*a*b*arctan(c*x))/(e*x^2 + d), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{(a+b\,\mathrm{atan}(c\,x))^2}{e\,x^2+d}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(d + e*x^2),x)
```

```
[Out] int((a + b*atan(c*x))^2/(d + e*x^2), x)
```

sympy **[F]** time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{atan}(cx))^2}{d + ex^2} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*atan(c*x))**2/(d + e*x**2), x)
```

3.1265 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x\left(d+ex^2\right)}\,dx$

Optimal. Leaf size=637

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2d}+\frac{ib\left(a+b\tan^{-1}(cx)\right)\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{e}x+\sqrt{-d}\right)}{\left(\sqrt{-d}c+i\sqrt{e}\right)(1-icx)}\right)}{2d}-\frac{\left(a+b\tan^{-1}(c\right.}{}$$

```
[Out] -2*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d+(a+b*arctan(c*x))^2*ln(2/(
1-I*c*x))/d-1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)
/(c*(-d)^(1/2)-I*e^(1/2)))/d-1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e
^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d-I*b*(a+b*arctan(c*x))*polylog
(2,1-2/(1-I*c*x))/d-I*b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/d+I*b*(a
+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d+1/2*I*b*(a+b*arctan(c*x))*polyl
og(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d+1/2
*I*b*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*
(-d)^(1/2)+I*e^(1/2)))/d+1/2*b^2*polylog(3,1-2/(1-I*c*x))/d-1/2*b^2*polylog
(3,1-2/(1+I*c*x))/d+1/2*b^2*polylog(3,-1+2/(1+I*c*x))/d-1/4*b^2*polylog(3,1
-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d-1/4*b^2*p
olylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d
```

Rubi [A] time = 0.67, antiderivative size = 637, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4980, 4850, 4988, 4884, 4994, 6610, 4858}

$$\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2d}+\frac{ib\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2d}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x*(d + e*x^2)),x]
```

```
[Out] (2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d + ((a + b*ArcTan[c*x
])^2*Log[2/(1 - I*c*x)])/d - ((a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] - Sq
rt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*d) - ((a + b*ArcTan[c
*x])^2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*
x))])/(2*d) - (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/d - (
I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/d + (I*b*(a + b*ArcT
an[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d + ((I/2)*b*(a + b*ArcTan[c*x])*P
olyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I
*c*x))])/d + ((I/2)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + S
qrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/d + (b^2*PolyLog[3, 1 -
 2/(1 - I*c*x)])/(2*d) - (b^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/(2*d) + (b^2*P
olyLog[3, -1 + 2/(1 + I*c*x)])/(2*d) - (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] -
 Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(4*d) - (b^2*PolyLog[
3, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))]
)/(4*d)
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
```

```
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x\left(d+ex^2\right)}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{ex\left(a+b\tan^{-1}(cx)\right)^2}{d\left(d+ex^2\right)}\right) dx$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx}{d} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx}{d}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} - \frac{(4bc)\int \frac{\left(a+b\tan^{-1}(cx)\right)\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{d} - e \ldots$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} + \frac{(2bc)\int \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{d} - \frac{(2bc)\ldots}{\ldots}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\,\mathrm{ta}\ldots\right.}{\ldots}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{d} - \frac{\left(a+b\,\mathrm{ta}\ldots\right.}{\ldots}$$

Mathematica [B] time = 7.59, size = 1412, normalized size = 2.22

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x*(d + e*x^2)),x]
```

```
[Out] (24*a^2*Log[x] - 12*a^2*Log[d + e*x^2] - 24*a*b*((-I)*ArcTan[c*x]^2 + (2*I)
*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[(c*e*x)/Sqrt[c^2*d*e]] - 2*ArcTan
[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + (-ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]
+ ArcTan[c*x])*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x])
)/(c^2*d - e)] + (ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]] + ArcTan[c*x])*Log[(-2*
Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 + E^((2*I)*ArcTan[c*x])) + c^2*
d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] + I*(ArcTan[c*x]^2 + PolyLog[2,
 E^((2*I)*ArcTan[c*x])]) - (I/2)*(PolyLog[2, ((-(c^2*d) - e + 2*Sqrt[c^2*d*
e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + PolyLog[2, -(((c^2*d + e + 2*Sqrt
[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e))])) + b^2*((-I)*Pi^3 + (16*I)
*ArcTan[c*x]^3 + 24*ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 12*ArcT
an[c*x]^2*Log[1 + ((c*Sqrt[d] - Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d]
+ Sqrt[e])] - 12*ArcTan[c*x]^2*Log[1 + ((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcT
an[c*x]))/(c*Sqrt[d] - Sqrt[e])] + 12*ArcTan[c*x]^2*Log[1 + ((c^2*d + e - 2
*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + 24*ArcSin[Sqrt[(c^2*d
)/(c^2*d - e)]]*ArcTan[c*x]*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)
*ArcTan[c*x]))/(c^2*d - e)] - 12*ArcTan[c*x]^2*Log[1 + ((c^2*d + e + 2*Sqrt
[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] - 24*ArcSin[Sqrt[(c^2*d)/(c^
2*d - e)]]*ArcTan[c*x]*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1
+ E^((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)]
- 24*ArcTan[c*x]^2*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 + E^
((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] + 24
*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[c*x]*Log[((2*I)*c^2*d - (2*I)*Sqr
t[c^2*d*e] + 2*c*(-e + Sqrt[c^2*d*e])*x)/((c^2*d - e)*(I + c*x))] + 12*ArcT
an[c*x]^2*Log[((2*I)*c^2*d - (2*I)*Sqrt[c^2*d*e] + 2*c*(-e + Sqrt[c^2*d*e])
*x)/((c^2*d - e)*(I + c*x))] - 24*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[
c*x]*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*(Cos[2*ArcTan[c*x]] + I*Sin[2*A
rcTan[c*x]]))/(c^2*d - e)] + 12*ArcTan[c*x]^2*Log[1 + ((c^2*d + e + 2*Sqrt[
```

```
c^2*d*e])*(Cos[2*ArcTan[c*x]] + I*Sin[2*ArcTan[c*x]]))/(c^2*d - e)] + (24*I
)*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + (12*I)*ArcTan[c*x]*PolyL
og[2, ((-(c*Sqrt[d]) + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] + Sqrt[e]
)] + (12*I)*ArcTan[c*x]*PolyLog[2, -(((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan
[c*x]))/(c*Sqrt[d] - Sqrt[e]))] + 12*PolyLog[3, E^((-2*I)*ArcTan[c*x])] - 6
*PolyLog[3, ((-(c*Sqrt[d]) + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] + S
qrt[e])] - 6*PolyLog[3, -(((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*
Sqrt[d] - Sqrt[e]))]))/(24*d)
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \arctan(cx)^2 + 2\,ab \arctan(cx) + a^2}{ex^3 + dx}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x^3 + d*x), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 24.51, size = 0, normalized size = 0.00

$$\int \frac{(a + b \arctan(cx))^2}{x\left(e\,x^2 + d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x/(e*x^2+d),x)
```

```
[Out] int((a+b*arctan(c*x))^2/x/(e*x^2+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a^2\left(\frac{\log\left(ex^2 + d\right)}{d} - \frac{2\,\log(x)}{d}\right) + \int \frac{b^2 \arctan(cx)^2 + 2\,ab \arctan(cx)}{ex^3 + dx}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(log(e*x^2 + d)/d - 2*log(x)/d) + integrate((b^2*arctan(c*x)^2 + 2
*a*b*arctan(c*x))/(e*x^3 + d*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}(c\,x))^2}{x\,\left(e\,x^2 + d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x*(d + e*x^2)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a + b \operatorname{atan}(cx))^2}{x (d + ex^2)} \, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x/(e*x**2+d),x)
[Out] Integral((a + b*atan(c*x))**2/(x*(d + e*x**2)), x)
```

3.1266 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2\left(d+ex^2\right)}\,dx$

Optimal. Leaf size=553

$$-\frac{ib\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)}{2(-d)^{3/2}}+\frac{ib\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\text{Li}_2\left(1-\frac{2c\left(\sqrt{e}x+\sqrt{-d}\right)}{\left(\sqrt{-d}c+i\sqrt{e}\right)(1-icx)}\right)}{2(-d)^{3/2}}+\frac{\sqrt{e}\left(a+b\right.}{}$$

```
[Out] -I*c*(a+b*arctan(c*x))^2/d-(a+b*arctan(c*x))^2/d/x+2*b*c*(a+b*arctan(c*x))*
ln(2-2/(1-I*c*x))/d-I*b^2*c*polylog(2,-1+2/(1-I*c*x))/d+1/2*(a+b*arctan(c*x
))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))*e^(1
/2)/(-d)^(3/2)-1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c
*x)/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(3/2)-1/2*I*b*(a+b*arctan(c*x))*
polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))*
e^(1/2)/(-d)^(3/2)+1/2*I*b*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)+x*
e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(3/2)+1/4*b^2*pol
ylog(3,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))*e^(
1/2)/(-d)^(3/2)-1/4*b^2*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c
*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(3/2)
```

Rubi [A] time = 0.52, antiderivative size = 553, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 7, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.304, Rules used = {4918, 4852, 4924, 4868, 2447, 4914, 4858}

$$-\frac{ib\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2(-d)^{3/2}}+\frac{ib\sqrt{e}\left(a+b\tan^{-1}(cx)\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}\right.}{(1-icx)\left(c\sqrt{-d}+i\right.}\right.}{2(-d)^{3/2}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^2*(d + e*x^2)),x]
```

```
[Out] ((-I)*c*(a + b*ArcTan[c*x])^2)/d - (a + b*ArcTan[c*x])^2/(d*x) + (Sqrt[e]*(
a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt
[e])*(1 - I*c*x))])/(2*(-d)^(3/2)) - (Sqrt[e]*(a + b*ArcTan[c*x])^2*Log[(2*
c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*(-d)^
(3/2)) + (2*b*c*(a + b*ArcTan[c*x])*Log[2 - 2/(1 - I*c*x)])/d - (I*b^2*c*Po
lyLog[2, -1 + 2/(1 - I*c*x)])/d - ((I/2)*b*Sqrt[e]*(a + b*ArcTan[c*x])*Poly
Log[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*
x))])/(-d)^(3/2) + ((I/2)*b*Sqrt[e]*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c
*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(-d)^(3/2
) + (b^2*Sqrt[e]*PolyLog[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] -
 I*Sqrt[e])*(1 - I*c*x))])/(4*(-d)^(3/2)) - (b^2*Sqrt[e]*PolyLog[3, 1 - (2*
c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*(-d)^
(3/2))
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
```

```
erQ[m]) && NeQ[m, -1]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2\left(d+ex^2\right)}\,dx = \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}dx}{d} - \frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} + \frac{(2bc)\int \frac{a+b\tan^{-1}(cx)}{x(1+c^2x^2)}dx}{d} - \frac{e\int \left(\frac{\sqrt{-d}\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\sqrt{-d}\left(a+b\tan^{-1}(c\right.}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right.}\right.}{d}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} + \frac{(2ibc)\int \frac{a+b\tan^{-1}(cx)}{x(i+cx)}dx}{d} - \frac{e\int \frac{\left(a+b\tan^{-1}(c\right.}{\sqrt{-d}-\sqrt{e}}}{2(-d)^{3/2}}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} + \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\right.}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1}\right.}{2(-d)^{3/2}}$$

$$= -\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} + \frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\right.}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1}\right.}{2(-d)^{3/2}}$$

Mathematica [F] time = 180.00, size = 0, normalized size = 0.00

$Aborted

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^2*(d + e*x^2)),x]
[Out] $Aborted
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\arctan(cx)^2 + 2\,ab\arctan(cx) + a^2}{ex^4 + dx^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x^2+d),x, algorithm="fricas")
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x^4 + d*x^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x^2+d),x, algorithm="giac")
[Out] Timed out
```

maple [F] time = 7.04, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arctan(cx))^2}{x^2\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^2/(e*x^2+d),x)
```

```
[Out] int((a+b*arctan(c*x))^2/x^2/(e*x^2+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-a^2\left(\frac{e\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,d}+\frac{1}{dx}\right)-\frac{4\,b^2\arctan\left(cx\right)^2-b^2\log\left(c^2x^2+1\right)^2-dx\int\frac{12\left(b^2c^2dx^2+b^2d\right)\arctan(cx)^2+\left(b^2c^2dx^2+b^2d\right)\log}{}}{16\,dx}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] -a^2*(e*arctan(e*x/sqrt(d*e))/(sqrt(d*e)*d) + 1/(d*x)) - 1/16*(4*b^2*arctan
(c*x)^2 - b^2*log(c^2*x^2 + 1)^2 - 16*d*x*integrate(1/16*(12*(b^2*c^2*d*x^2
 + b^2*d)*arctan(c*x)^2 + (b^2*c^2*d*x^2 + b^2*d)*log(c^2*x^2 + 1)^2 + 8*(4
*a*b*c^2*d*x^2 + b^2*c*e*x^3 + b^2*c*d*x + 4*a*b*d)*arctan(c*x) - 4*(b^2*c^
2*e*x^4 + b^2*c^2*d*x^2)*log(c^2*x^2 + 1))/(c^2*d*e*x^6 + (c^2*d^2 + d*e)*x
^4 + d^2*x^2), x))/(d*x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{x^2\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^2*(d + e*x^2)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^2*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\operatorname{atan}{\left(cx\right)}\right)^{2}}{x^{2}\left(d+ex^{2}\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**2/(e*x**2+d),x)
```

```
[Out] Integral((a + b*atan(c*x))**2/(x**2*(d + e*x**2)), x)
```

3.1267 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3\left(d+ex^2\right)}\,dx$

Optimal. Leaf size=745

$$-\frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d}+\frac{ibe\text{Li}_2\left(1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{ibe\text{Li}_2\left(1-\frac{2}{icx+1}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ibe\text{Li}_2\left(\frac{2}{icx+1}-\right.}{}$$

```
[Out] -b*c*(a+b*arctan(c*x))/d/x-1/2*c^2*(a+b*arctan(c*x))^2/d-1/2*(a+b*arctan(c*
x))^2/d/x^2+2*e*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d^2+b^2*c^2*ln(
x)/d-e*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/d^2-1/2*b^2*c^2*ln(c^2*x^2+1)/d+
1/2*e*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(
1/2)-I*e^(1/2)))/d^2+1/2*e*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e^(1/2)
)/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^2+I*b*e*(a+b*arctan(c*x))*polylog(2
,1-2/(1-I*c*x))/d^2-1/2*I*b*e*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)
+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^2-I*b*e*(a+b*arctan(c*x))
*polylog(2,-1+2/(1+I*c*x))/d^2+I*b*e*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c
*x))/d^2-1/2*I*b*e*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))
/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2-1/2*b^2*e*polylog(3,1-2/(1-I*c*x))
/d^2+1/2*b^2*e*polylog(3,1-2/(1+I*c*x))/d^2-1/2*b^2*e*polylog(3,-1+2/(1+I*c
*x))/d^2+1/4*b^2*e*polylog(3,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)
^(1/2)-I*e^(1/2)))/d^2+1/4*b^2*e*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-
I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^2
```

Rubi [A] time = 0.92, antiderivative size = 745, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 13, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.565, Rules used = {4918, 4852, 266, 36, 29, 31, 4884, 4980, 4850, 4988, 4994, 6610, 4858}

$$\frac{ibe\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}+\frac{ibe\text{PolyLog}\left(2,1-\frac{2}{1+icx}\right)\left(a+b\tan^{-1}(cx)\right)}{d^2}-\frac{ibe\text{PolyLog}\left(2,-1+\frac{2}{1+\dots}\right.}{d^2}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^3*(d + e*x^2)),x]
```

```
[Out] -((b*c*(a + b*ArcTan[c*x]))/(d*x)) - (c^2*(a + b*ArcTan[c*x])^2)/(2*d) - (a
 + b*ArcTan[c*x])^2/(2*d*x^2) - (2*e*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1
 + I*c*x)])/d^2 + (b^2*c^2*Log[x])/d - (e*(a + b*ArcTan[c*x])^2*Log[2/(1 -
I*c*x)])/d^2 + (e*(a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((
c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*d^2) + (e*(a + b*ArcTan[c*x])^2*L
og[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2
*d^2) - (b^2*c^2*Log[1 + c^2*x^2])/(2*d) + (I*b*e*(a + b*ArcTan[c*x])*PolyL
og[2, 1 - 2/(1 - I*c*x)])/d^2 + (I*b*e*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2
/(1 + I*c*x)])/d^2 - (I*b*e*(a + b*ArcTan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*
x)])/d^2 - ((I/2)*b*e*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] - S
qrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^2 - ((I/2)*b*e*(a + b
*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*
Sqrt[e])*(1 - I*c*x))])/d^2 - (b^2*e*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*d^2)
 + (b^2*e*PolyLog[3, 1 - 2/(1 + I*c*x)])/(2*d^2) - (b^2*e*PolyLog[3, -1 + 2
/(1 + I*c*x)])/(2*d^2) + (b^2*e*PolyLog[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))
/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(4*d^2) + (b^2*e*PolyLog[3, 1 - (
2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*d^2
)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
```

```
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3\left(d+ex^2\right)}\,dx = \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}\,dx}{d} - \frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x\left(d+ex^2\right)}\,dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{(bc)\int \frac{a+b\tan^{-1}(cx)}{x^2\left(1+c^2x^2\right)}\,dx}{d} - \frac{e\int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{dx} - \frac{ex\left(a+b\tan^{-1}(cx)\right)^2}{d\left(d+ex^2\right)}\right) dx}{d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} + \frac{(bc)\int \frac{a+b\tan^{-1}(cx)}{x^2}\,dx}{d} - \frac{\left(bc^3\right)\int \frac{a+b\tan^{-1}(cx)}{1+c^2x^2}\,dx}{d} - \frac{e\int \frac{\left(a+b\tan^{-1}(cx\right.}{x}}{d^2}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} - \frac{2e\left(a+b\tan^{-1}(\right.}{}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} - \frac{2e\left(a+b\tan^{-1}(\right.}{}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} - \frac{2e\left(a+b\tan^{-1}(\right.}{}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{dx} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2dx^2} - \frac{2e\left(a+b\tan^{-1}(\right.}{}$$

Mathematica [B] time = 11.73, size = 1557, normalized size = 2.09

result too large to display

Warning: Unable to verify antiderivative.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^3*(d + e*x^2)),x]
```

```
[Out] -1/24*((12*a^2*d)/x^2 + (24*a*b*c*d)/x + (24*a*b*d*(1 + c^2*x^2)*ArcTan[c*x
])/x^2 + 24*a^2*e*Log[x] - 12*a^2*e*Log[d + e*x^2] - (24*I)*a*b*e*(ArcTan[c
*x]*(ArcTan[c*x] + (2*I)*Log[1 - E^((2*I)*ArcTan[c*x])]) + PolyLog[2, E^((2
*I)*ArcTan[c*x])]) - (48*a*b*(c^2*d - e)*e*((-I)*ArcTan[c*x]^2 + (2*I)*ArcS
in[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[(c*e*x)/Sqrt[c^2*d*e]] + (-ArcSin[Sqrt
[(c^2*d)/(c^2*d - e)]] + ArcTan[c*x])*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e]
)*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + (ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]
+ ArcTan[c*x])*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 + E^((2*
I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] - (I/2)*
(PolyLog[2, ((-(c^2*d) - e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d
 - e)] + PolyLog[2, -(((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))
/(c^2*d - e))])))/(2*c^2*d - 2*e) + b^2*((-I)*e*Pi^3 + (24*c*d*ArcTan[c*x])
/x + (12*d*(1 + c^2*x^2)*ArcTan[c*x]^2)/x^2 + (8*I)*e*ArcTan[c*x]^3 + 24*e*
ArcTan[c*x]^2*Log[1 - E^((-2*I)*ArcTan[c*x])] - 24*c^2*d*Log[(c*x)/Sqrt[1 +
 c^2*x^2]] + (24*I)*e*ArcTan[c*x]*PolyLog[2, E^((-2*I)*ArcTan[c*x])] + 12*e
*PolyLog[3, E^((-2*I)*ArcTan[c*x])]) + 2*b^2*e*((4*I)*ArcTan[c*x]^3 - 6*Arc
Tan[c*x]^2*Log[1 + ((c*Sqrt[d] - Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d]
 + Sqrt[e])] - 6*ArcTan[c*x]^2*Log[1 + ((c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcT
an[c*x]))/(c*Sqrt[d] - Sqrt[e])] + 6*ArcTan[c*x]^2*Log[1 + ((c^2*d + e - 2*
Sqrt[c^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] + 12*ArcSin[Sqrt[(c^2*d)
/(c^2*d - e)]]*ArcTan[c*x]*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*E^((2*I)*
ArcTan[c*x]))/(c^2*d - e)] - 6*ArcTan[c*x]^2*Log[1 + ((c^2*d + e + 2*Sqrt[c
^2*d*e])*E^((2*I)*ArcTan[c*x]))/(c^2*d - e)] - 12*ArcSin[Sqrt[(c^2*d)/(c^2*
d - e)]]*ArcTan[c*x]*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 +
E^((2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] -
12*ArcTan[c*x]^2*Log[(-2*Sqrt[c^2*d*e]*E^((2*I)*ArcTan[c*x]) + e*(-1 + E^((
2*I)*ArcTan[c*x])) + c^2*d*(1 + E^((2*I)*ArcTan[c*x])))/(c^2*d - e)] + 12*A
rcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[c*x]*Log[((2*I)*c^2*d - (2*I)*Sqrt[
c^2*d*e] + 2*c*(-e + Sqrt[c^2*d*e])*x)/((c^2*d - e)*(I + c*x))] + 6*ArcTan[
c*x]^2*Log[((2*I)*c^2*d - (2*I)*Sqrt[c^2*d*e] + 2*c*(-e + Sqrt[c^2*d*e])*x)
/((c^2*d - e)*(I + c*x))] - 12*ArcSin[Sqrt[(c^2*d)/(c^2*d - e)]]*ArcTan[c*x
]*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*d*e])*(Cos[2*ArcTan[c*x]] + I*Sin[2*ArcT
an[c*x]]))/(c^2*d - e)] + 6*ArcTan[c*x]^2*Log[1 + ((c^2*d + e + 2*Sqrt[c^2*
d*e])*(Cos[2*ArcTan[c*x]] + I*Sin[2*ArcTan[c*x]]))/(c^2*d - e)] + (6*I)*Arc
Tan[c*x]*PolyLog[2, ((-(c*Sqrt[d]) + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqr
t[d] + Sqrt[e])] + (6*I)*ArcTan[c*x]*PolyLog[2, -(((c*Sqrt[d] + Sqrt[e])*E^
((2*I)*ArcTan[c*x]))/(c*Sqrt[d] - Sqrt[e]))] - 3*PolyLog[3, ((-(c*Sqrt[d])
+ Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] + Sqrt[e])] - 3*PolyLog[3, -((
(c*Sqrt[d] + Sqrt[e])*E^((2*I)*ArcTan[c*x]))/(c*Sqrt[d] - Sqrt[e]))]))/d^2
```

fricas [F] time = 0.64, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \arctan(cx)^2 + 2\,ab\arctan(cx) + a^2}{ex^5 + dx^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x^2+d),x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e*x^5 + d*x^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x^2+d),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 74.80, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arctan(cx))^2}{x^3\left(e\,x^2+d\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^3/(e*x^2+d),x)
```

```
[Out] int((a+b*arctan(c*x))^2/x^3/(e*x^2+d),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}a^2\left(\frac{e\log\left(ex^2+d\right)}{d^2}-\frac{2\,e\log(x)}{d^2}-\frac{1}{dx^2}\right)+\int \frac{b^2\arctan(cx)^2+2\,ab\arctan(cx)}{ex^5+dx^3}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x^2+d),x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(e*log(e*x^2 + d)/d^2 - 2*e*log(x)/d^2 - 1/(d*x^2)) + integrate((b^
2*arctan(c*x)^2 + 2*a*b*arctan(c*x))/(e*x^5 + d*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))^2}{x^3\,\left(e\,x^2+d\right)}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^3*(d + e*x^2)),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^3*(d + e*x^2)), x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{atan}(cx))^2}{x^3\left(d+ex^2\right)}dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**3/(e*x**2+d),x)
```

```
[Out] Integral((a + b*atan(c*x))**2/(x**3*(d + e*x**2)), x)
```

3.1268 $\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=943

$$\frac{ic\sqrt{-d}\,\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4\left(c^2d-e\right)e^{3/2}}-\frac{ic\sqrt{-d}\,\mathrm{Li}_2\left(1-\frac{2c\left(\sqrt{e}\,x+\sqrt{-d}\right)}{\left(\sqrt{-d}\,c+i\sqrt{e}\right)(1-icx)}\right)b^2}{4\left(c^2d-e\right)e^{3/2}}-\frac{\mathrm{Li}_3\left(1-\frac{2}{1-icx}\right)b^2}{2e^2}+\frac{\mathrm{Li}_3\left(1-\frac{2c\left(\sqrt{-d}\right.}{\left(c\sqrt{-d}-i\right.}\right.}{4e^2}$$

```
[Out] -1/2*c^2*d*(a+b*arctan(c*x))^2/(c^2*d-e)/e^2-(a+b*arctan(c*x))^2*ln(2/(1-I*
c*x))/e^2+1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(
c*(-d)^(1/2)-I*e^(1/2)))/e^2+1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e
^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2-1/2*I*b*(a+b*arctan(c*x))*p
olylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e
^2-1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/
2)+I*e^(1/2)))*(-d)^(1/2)/(c^2*d-e)/e^(3/2)-1/2*I*b*(a+b*arctan(c*x))*polyl
og(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2-1
/2*b^2*polylog(3,1-2/(1-I*c*x))/e^2+1/4*b^2*polylog(3,1-2*c*((-d)^(1/2)-x*e
^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^2+1/4*b^2*polylog(3,1-2*c*((-
d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^2-1/2*b*c*(a+b*ar
ctan(c*x))*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2))
)*(-d)^(1/2)/(c^2*d-e)/e^(3/2)+1/2*b*c*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)
+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*(-d)^(1/2)/(c^2*d-e)/e^(3/2
)+1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2
)-I*e^(1/2)))*(-d)^(1/2)/(c^2*d-e)/e^(3/2)+I*b*(a+b*arctan(c*x))*polylog(2,
1-2/(1-I*c*x))/e^2+1/4*(a+b*arctan(c*x))^2/e^2/(1-x*e^(1/2)/(-d)^(1/2))+1/4
*(a+b*arctan(c*x))^2/e^2/(1+x*e^(1/2)/(-d)^(1/2))
```

Rubi [A] time = 1.76, antiderivative size = 943, normalized size of antiderivative = 1.00, number of steps used = 33, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4980, 4978, 4864, 4856, 2402, 2315, 2447, 4984, 4884, 4920, 4854, 4858}

$$\frac{ic\sqrt{-d}\,\mathrm{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4\left(c^2d-e\right)e^{3/2}}-\frac{ic\sqrt{-d}\,\mathrm{PolyLog}\left(2,1-\frac{2c\left(\sqrt{e}\,x+\sqrt{-d}\right)}{\left(\sqrt{-d}\,c+i\sqrt{e}\right)(1-icx)}\right)b^2}{4\left(c^2d-e\right)e^{3/2}}-\frac{\mathrm{PolyLog}\left(3,1-\frac{2}{1-i\right.}{2e^2}$$

Antiderivative was successfully verified.

```
[In] Int[(x^3*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2,x]
```

```
[Out] -(c^2*d*(a + b*ArcTan[c*x])^2)/(2*(c^2*d - e)*e^2) + (a + b*ArcTan[c*x])^2/
(4*e^2*(1 - (Sqrt[e]*x)/Sqrt[-d])) + (a + b*ArcTan[c*x])^2/(4*e^2*(1 + (Sqr
t[e]*x)/Sqrt[-d])) - ((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e^2 - (b*c*
Sqrt[-d]*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d]
- I*Sqrt[e])*(1 - I*c*x))])/(2*(c^2*d - e)*e^(3/2)) + ((a + b*ArcTan[c*x])^
2*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])
/(2*e^2) + (b*c*Sqrt[-d]*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x
))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*(c^2*d - e)*e^(3/2)) + ((a +
 b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e]
)*(1 - I*c*x))])/(2*e^2) + (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I
*c*x)])/e^2 + ((I/4)*b^2*c*Sqrt[-d]*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]
*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/((c^2*d - e)*e^(3/2)) - ((I/2
)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqr
t[-d] - I*Sqrt[e])*(1 - I*c*x))])/e^2 - ((I/4)*b^2*c*Sqrt[-d]*PolyLog[2, 1
- (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/((c
^2*d - e)*e^(3/2)) - ((I/2)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt
```

```
[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/e^2 - (b^2*Poly
Log[3, 1 - 2/(1 - I*c*x)])/(2*e^2) + (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] - S
qrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(4*e^2) + (b^2*PolyLog[
3, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))]
)/(4*e^2)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4978

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2)^2
, x_Symbol] :> Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcTan[c*x])^p/(1 -
 Rt[-(e/d), 2]*x)^2, x], x] - Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcT
an[c*x])^p/(1 + Rt[-(e/d), 2]*x)^2, x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4984

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^3 \left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx = \int \left(-\frac{dx\left(a+b\tan^{-1}(cx)\right)^2}{e\left(d+ex^2\right)^2}+\frac{x\left(a+b\tan^{-1}(cx)\right)^2}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}dx}{e} - \frac{d\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx}{e}$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)^2}dx}{4\sqrt{-d}\,e^{3/2}} - \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)^2}dx}{4\sqrt{-d}\,e^{3/2}} + \frac{\int \left(-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}\right)dx}{e}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{(bc)\int \left(\frac{\sqrt{-d}\,e\left(a+b\tan^{-1}(cx)\right)}{\left(c^2d-e\right)\left(-\sqrt{-d}+\sqrt{e}x\right)}+\frac{c^2d\left(\sqrt{-d}+\sqrt{e}x\right)}{\sqrt{-d}\left(c^2d-\right.}\right.}{2e^2}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} + \frac{\left(a+b\,\mathrm{t}\right.}{}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{bc\sqrt{-d}}{}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2}{1-icx}\right)}{e^2} - \frac{bc\sqrt{-d}}{}$$

$$= -\frac{c^2d\left(a+b\tan^{-1}(cx)\right)^2}{2\left(c^2d-e\right)e^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^2\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(\right.}{}$$

Mathematica [F] time = 19.75, size = 0, normalized size = 0.00

$$\int \frac{x^3\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^3*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2,x]
[Out] Integrate[(x^3*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2, x]
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{b^2x^3\arctan(cx)^2+2\,abx^3\arctan(cx)+a^2x^3}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b^2*x^3*arctan(c*x)^2 + 2*a*b*x^3*arctan(c*x) + a^2*x^3)/(e^2*x^4
 + 2*d*e*x^2 + d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 26.50, size = 0, normalized size = 0.00

$$\int \frac{x^{3} \left(a +b \arctan \left(c x \right)\right)^{2}}{\left(e \,x^{2}+d \right)^{2}}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x)
```

```
[Out] int(x^3*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2} \, a^{2} {\left(\frac{d}{e^{3} x^{2} + d e^{2}} + \frac{\log\left(e x^{2} + d\right)}{e^{2}}\right)} + \int \frac{b^{2} x^{3} \arctan\left(c x\right)^{2} + 2 \, a b x^{3} \arctan\left(c x\right)}{e^{2} x^{4} + 2 \, d e x^{2} + d^{2}}\,{d x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(d/(e^3*x^2 + d*e^2) + log(e*x^2 + d)/e^2) + integrate((b^2*x^3*arc
tan(c*x)^2 + 2*a*b*x^3*arctan(c*x))/(e^2*x^4 + 2*d*e*x^2 + d^2), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^3\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{{\left(e\,x^2+d\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^3*(a + b*atan(c*x))^2)/(d + e*x^2)^2,x)
```

```
[Out] int((x^3*(a + b*atan(c*x))^2)/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1269 $\int \frac{x^2(a+b\tan^{-1}(cx))^2}{(d+ex^2)^2}\,dx$

Optimal. Leaf size=1033

$$-\frac{ic\text{Li}_2\left(1-\frac{2}{1-icx}\right)b^2}{2\left(c^2d-e\right)e}-\frac{ic\text{Li}_2\left(1-\frac{2}{icx+1}\right)b^2}{2\left(c^2d-e\right)e}+\frac{ic\text{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4\left(c^2d-e\right)e}+\frac{ic\text{Li}_2\left(1-\frac{2c\left(\sqrt{e}x+\sqrt{-d}\right)}{\left(\sqrt{-d}c+i\sqrt{e}\right)(1-icx)}\right)b^2}{4\left(c^2d-e\right)e}+\frac{\text{Li}_3\left(1\right.}{}$$

```
[Out] -1/2*I*b^2*c*polylog(2,1-2/(1+I*c*x))/(c^2*d-e)/e+b*c*(a+b*arctan(c*x))*ln(
2/(1-I*c*x))/(c^2*d-e)/e-b*c*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/(c^2*d-e)/e-
1/2*b*c*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(
1/2)-I*e^(1/2)))/(c^2*d-e)/e-1/2*b*c*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x
*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/(c^2*d-e)/e-1/4*I*b*(a+b*arct
an(c*x))*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e
^(1/2)))/e^(3/2)/(-d)^(1/2)-1/2*I*c*(a+b*arctan(c*x))^2/(c^2*d-e)/e-1/2*I*b
^2*c*polylog(2,1-2/(1-I*c*x))/(c^2*d-e)/e+1/4*I*b*(a+b*arctan(c*x))*polylog
(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^(3/2)
/(-d)^(1/2)+1/4*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)
/(c*(-d)^(1/2)-I*e^(1/2)))/e^(3/2)/(-d)^(1/2)-1/4*(a+b*arctan(c*x))^2*ln(2*
c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/e^(3/2)/(-d)^(
1/2)+1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(
1/2)+I*e^(1/2)))/(c^2*d-e)/e+1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1
/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/(c^2*d-e)/e+1/8*b^2*polylog(3,1-2*
c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/e^(3/2)/(-d)^(
1/2)-1/8*b^2*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)
+I*e^(1/2)))/e^(3/2)/(-d)^(1/2)+1/4*(a+b*arctan(c*x))^2/e^(3/2)/((-d)^(1/2)
-x*e^(1/2))-1/4*(a+b*arctan(c*x))^2/e^(3/2)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] time = 1.95, antiderivative size = 1033, normalized size of antiderivative = 1.00, number of steps used = 38, number of rules used = 12, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.522, Rules used = {4980, 4914, 4864, 4856, 2402, 2315, 2447, 4984, 4884, 4920, 4854, 4858}

$$-\frac{ic\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)b^2}{2\left(c^2d-e\right)e}-\frac{ic\text{PolyLog}\left(2,1-\frac{2}{icx+1}\right)b^2}{2\left(c^2d-e\right)e}+\frac{ic\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4\left(c^2d-e\right)e}+\frac{ic\text{PolyLog}\left(2\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(x^2*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2,x]
```

```
[Out] ((-I/2)*c*(a + b*ArcTan[c*x])^2)/((c^2*d - e)*e) + (a + b*ArcTan[c*x])^2/(4
*e^(3/2)*(Sqrt[-d] - Sqrt[e]*x)) - (a + b*ArcTan[c*x])^2/(4*e^(3/2)*(Sqrt[-
d] + Sqrt[e]*x)) + (b*c*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/((c^2*d - e
)*e) - (b*c*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/((c^2*d - e)*e) - (b*c*
(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[
e])*(1 - I*c*x))])/(2*(c^2*d - e)*e) + ((a + b*ArcTan[c*x])^2*Log[(2*c*(Sqr
t[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(4*Sqrt[-d]*e^
(3/2)) - (b*c*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt
[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*(c^2*d - e)*e) - ((a + b*ArcTan[c*x])^2
*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/
(4*Sqrt[-d]*e^(3/2)) - ((I/2)*b^2*c*PolyLog[2, 1 - 2/(1 - I*c*x)])/((c^2*d
- e)*e) - ((I/2)*b^2*c*PolyLog[2, 1 - 2/(1 + I*c*x)])/((c^2*d - e)*e) + ((I
/4)*b^2*c*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt
[e])*(1 - I*c*x))])/((c^2*d - e)*e) - ((I/4)*b*(a + b*ArcTan[c*x])*PolyLog[
2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))]
)/(Sqrt[-d]*e^(3/2)) + ((I/4)*b^2*c*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]
```

```
*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/((c^2*d - e)*e) + ((I/4)*b*(a
 + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d]
+ I*Sqrt[e])*(1 - I*c*x))])/(Sqrt[-d]*e^(3/2)) + (b^2*PolyLog[3, 1 - (2*c*(
Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(8*Sqrt[-d]
*e^(3/2)) - (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] +
 I*Sqrt[e])*(1 - I*c*x))])/(8*Sqrt[-d]*e^(3/2))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[(a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4984

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x^2 \left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx = \int \left(-\frac{d\left(a+b\tan^{-1}(cx)\right)^2}{e\left(d+ex^2\right)^2} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{e\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}dx}{e} - \frac{d\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx}{e}$$

$$= \frac{\int \left(\frac{\sqrt{-d}\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)} + \frac{\sqrt{-d}\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}+\sqrt{e}\,x\right)}\right)dx}{e} - \frac{d\int \left(-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2} - \frac{e\left(a+b\tan^{-1}\right.}{4d\left(\sqrt{-d}\sqrt{e}\right.}\right.}{e}$$

$$= \frac{1}{4}\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx + \frac{1}{4}\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx + \frac{1}{2}\int \frac{\left(a+b\tan^{-1}(cx\right.}{-de-e^2x^2}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c\left(\sqrt{-d}-\right.}{\left(c\sqrt{-d}-i\sqrt{e}\right)(}\right.}{2\sqrt{-d}\,e^{3/2}}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2\log\left(\frac{2c\left(\sqrt{-d}-\right.}{\left(c\sqrt{-d}-i\sqrt{e}\right)(}\right.}{2\sqrt{-d}\,e^{3/2}}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{\left(c^2d-e\right)e} - \cdots$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{\left(c^2d-e\right)e} - \cdots$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{\left(c^2d-e\right)e} - \cdots$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{\left(c^2d-e\right)e} - \cdots$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{\left(c^2d-e\right)e} - \cdots$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}-\sqrt{e}\,x\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4e^{3/2}\left(\sqrt{-d}+\sqrt{e}\,x\right)} + \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{\left(c^2d-e\right)e} - \cdots$$

Mathematica [F] time = 45.35, size = 0, normalized size = 0.00

$$\int \frac{x^2 \left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(x^2*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2,x]
```

```
[Out] Integrate[(x^2*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2, x]
```

fricas [F] time = 0.46, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2x^2\arctan(cx)^2 + 2\,abx^2\arctan(cx) + a^2x^2}{e^2x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x^2*arctan(c*x)^2 + 2*a*b*x^2*arctan(c*x) + a^2*x^2)/(e^2*x^4
 + 2*d*e*x^2 + d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 3.10, size = 6575, normalized size = 6.36

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}a^2\left(\frac{x}{e^2x^2+de} - \frac{\arctan\left(\frac{ex}{\sqrt{de}}\right)}{\sqrt{de}\,e}\right) - \frac{4\,b^2x\arctan(cx)^2 - b^2x\log\left(c^2x^2+1\right)^2 - 2\left(e^2x^2+de\right)\int \frac{12\left(b^2c^2ex^4+b^2ex^2\right)\arctan}{}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] -1/2*a^2*(x/(e^2*x^2 + d*e) - arctan(e*x/sqrt(d*e))/(sqrt(d*e)*e)) - 1/32*(
4*b^2*x*arctan(c*x)^2 - b^2*x*log(c^2*x^2 + 1)^2 - 32*(e^2*x^2 + d*e)*integ
rate(1/16*(12*(b^2*c^2*e*x^4 + b^2*e*x^2)*arctan(c*x)^2 + (b^2*c^2*e*x^4 +
b^2*e*x^2)*log(c^2*x^2 + 1)^2 + 4*(8*a*b*c^2*e*x^4 + b^2*c*e*x^3 + b^2*c*d*
x + 8*a*b*e*x^2)*arctan(c*x) - 2*(b^2*c^2*e*x^4 + b^2*c^2*d*x^2)*log(c^2*x^
2 + 1))/(c^2*e^3*x^6 + (2*c^2*d*e^2 + e^3)*x^4 + d^2*e + (c^2*d^2*e + 2*d*e
^2)*x^2), x))/(e^2*x^2 + d*e)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x^2\,{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)}^2}{{\left(e\,x^2+d\right)}^2} \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x^2*(a + b*atan(c*x))^2)/(d + e*x^2)^2,x)
```

```
[Out] int((x^2*(a + b*atan(c*x))^2)/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1270 $\int \frac{x(a+b\tan^{-1}(cx))^2}{(d+ex^2)^2} dx$

Optimal. Leaf size=457

$$\frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2e\left(c^2d-e\right)}-\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{2\sqrt{-d}\,\sqrt{e}\,\left(c^2d-e\right)}+\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{2\sqrt{-d}\,\sqrt{e}\,\left(c^2d-e\right)}-\ldots$$

```
[Out] 1/2*c^2*(a+b*arctan(c*x))^2/(c^2*d-e)/e-1/2*b*c*(a+b*arctan(c*x))*ln(2*c*((
-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/(c^2*d-e)/(-d)^(1/
2)/e^(1/2)+1/2*b*c*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x
)/(c*(-d)^(1/2)+I*e^(1/2)))/(c^2*d-e)/(-d)^(1/2)/e^(1/2)+1/4*I*b^2*c*polylo
g(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/(c^2*d
-e)/(-d)^(1/2)/e^(1/2)-1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(
1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/(c^2*d-e)/(-d)^(1/2)/e^(1/2)-1/4*(a+b*ar
ctan(c*x))^2/d/e/(1-x*e^(1/2)/(-d)^(1/2))-1/4*(a+b*arctan(c*x))^2/d/e/(1+x*
e^(1/2)/(-d)^(1/2))
```

Rubi [A] time = 1.09, antiderivative size = 457, normalized size of antiderivative = 1.00, number of steps used = 27, number of rules used = 10, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.476, Rules used = {4978, 4864, 4856, 2402, 2315, 2447, 4984, 4884, 4920, 4854}

$$\frac{ib^2c\,\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}-i\sqrt{e}\right)}\right)}{4\sqrt{-d}\,\sqrt{e}\,\left(c^2d-e\right)}-\frac{ib^2c\,\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}+\sqrt{e}\,x\right)}{(1-icx)\left(c\sqrt{-d}+i\sqrt{e}\right)}\right)}{4\sqrt{-d}\,\sqrt{e}\,\left(c^2d-e\right)}+\frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2e\left(c^2d-e\right)}-\ldots$$

Antiderivative was successfully verified.

```
[In] Int[(x*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2,x]
```

```
[Out] (c^2*(a + b*ArcTan[c*x])^2)/(2*(c^2*d - e)*e) - (a + b*ArcTan[c*x])^2/(4*d*
e*(1 - (Sqrt[e]*x)/Sqrt[-d])) - (a + b*ArcTan[c*x])^2/(4*d*e*(1 + (Sqrt[e]*
x)/Sqrt[-d])) - (b*c*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/(
(c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*Sqrt[-d]*(c^2*d - e)*Sqrt[e]) +
(b*c*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*
Sqrt[e])*(1 - I*c*x))])/(2*Sqrt[-d]*(c^2*d - e)*Sqrt[e]) + ((I/4)*b^2*c*Pol
yLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c
*x))])/(Sqrt[-d]*(c^2*d - e)*Sqrt[e]) - ((I/4)*b^2*c*PolyLog[2, 1 - (2*c*(S
qrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(Sqrt[-d]*(c
^2*d - e)*Sqrt[e])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
```

```
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4978

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2)^2
, x_Symbol] :> Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcTan[c*x])^p/(1 -
 Rt[-(e/d), 2]*x)^2, x], x] - Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcT
an[c*x])^p/(1 + Rt[-(e/d), 2]*x)^2, x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 0]
```

Rule 4984

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}\,dx = \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)^2}dx}{4(-d)^{3/2}\sqrt{e}} - \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)^2}dx}{4(-d)^{3/2}\sqrt{e}}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} + \frac{(bc)\int \left(\frac{\sqrt{-d}\,e\left(a+b\tan^{-1}(cx)\right)}{\left(c^2d-e\right)\left(-\sqrt{-d}+\sqrt{e}x\right)} + \frac{c^2d\left(\sqrt{-d}+\sqrt{e}x\right.}{\sqrt{-d}\left(c^2d-\right.}\right.}{2de}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{(bc)\int \frac{a+b\tan^{-1}(cx)}{-\sqrt{-d}+\sqrt{e}x}dx}{2\sqrt{-d}\left(c^2d-e\right)} + \frac{(bc)\int \frac{a+b\tan^{-1}(c}{\sqrt{-d}+\sqrt{e}x}}{2\sqrt{-d}\left(c^2d-\right.}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-ic\right.}\right.}{2\sqrt{-d}\left(c^2d-e\right)\sqrt{e}}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-ic\right.}\right.}{2\sqrt{-d}\left(c^2d-e\right)\sqrt{e}}$$

$$= \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2\left(c^2d-e\right)e} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4de\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{bc\left(a+b\tan^{-1}(c\right.}{2\sqrt{-d}}$$

Mathematica [A] time = 8.88, size = 885, normalized size = 1.94

$$-\frac{a^2}{2e\left(ex^2+d\right)}+2bc^2\left(\frac{c\tan^{-1}(cx)-\frac{\sqrt{e}\tan^{-1}\left(\frac{\sqrt{e}x}{\sqrt{d}}\right)}{\sqrt{d}}}{2e\left(c^3d-ce\right)}-\frac{\tan^{-1}(cx)}{2e\left(ex^2c^2+dc^2\right)}\right)a+\frac{b^2c^2\left(\frac{4\tan^{-1}(cx)^2}{dc^2+e+\left(c^2d-e\right)\cos\left(2\tan^{-1}(cx)\right)}+\frac{4\tan^{-1}(cx}{}\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[(x*(a + b*ArcTan[c*x])^2)/(d + e*x^2)^2,x]
```

```
[Out] -1/2*a^2/(e*(d + e*x^2)) + 2*a*b*c^2*(-1/2*ArcTan[c*x]/(e*(c^2*d + c^2*e*x^
2)) + (c*ArcTan[c*x] - (Sqrt[e]*ArcTan[(Sqrt[e]*x)/Sqrt[d]])/Sqrt[d])/(2*e*
(c^3*d - c*e))) + (b^2*c^2*((4*ArcTan[c*x]^2)/(c^2*d + e + (c^2*d - e)*Cos[
2*ArcTan[c*x]]) + (4*ArcTan[c*x]*ArcTanh[Sqrt[-(c^2*d*e)]/(c*e*x)] - 2*ArcC
os[-((c^2*d + e)/(c^2*d - e))]*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]] + (ArcCos[
-((c^2*d + e)/(c^2*d - e))] + (2*I)*ArcTanh[(c*e*x)/Sqrt[-(c^2*d*e)]])*Log[
(2*c^2*d*((-I)*e + Sqrt[-(c^2*d*e)])*(-I + c*x))/((c^2*d - e)*(c^2*d + c*Sq
rt[-(c^2*d*e)]*x))] + (ArcCos[-((c^2*d + e)/(c^2*d - e))] - (2*I)*ArcTanh[(
c*e*x)/Sqrt[-(c^2*d*e)]])*Log[(2*c^2*d*(I*e + Sqrt[-(c^2*d*e)])*(I + c*x))/
((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] - (ArcCos[-((c^2*d + e)/(c^2*
d - e))] - (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTanh[(c*e*x)/Sqr
t[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)])/(Sqrt[c^2*d - e]*E^(I*ArcTa
n[c*x])*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] - (ArcCos[-((c^2
*d + e)/(c^2*d - e))] + (2*I)*(ArcTanh[(c*d)/(Sqrt[-(c^2*d*e)]*x)] + ArcTan
h[(c*e*x)/Sqrt[-(c^2*d*e)]]))*Log[(Sqrt[2]*Sqrt[-(c^2*d*e)]*E^(I*ArcTan[c*x
]))/(Sqrt[c^2*d - e]*Sqrt[c^2*d + e + (c^2*d - e)*Cos[2*ArcTan[c*x]]])] - I
```

```
*(PolyLog[2, ((c^2*d + e - (2*I)*Sqrt[-(c^2*d*e)])*(c^2*d - c*Sqrt[-(c^2*d*
e)]*x))/((c^2*d - e)*(c^2*d + c*Sqrt[-(c^2*d*e)]*x))] - PolyLog[2, ((c^2*d
+ e + (2*I)*Sqrt[-(c^2*d*e)])*(c^2*d - c*Sqrt[-(c^2*d*e)]*x))/((c^2*d - e)*
(c^2*d + c*Sqrt[-(c^2*d*e)]*x))]))/Sqrt[-(c^2*d*e)]))/(4*(c^2*d - e))
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 x \arctan(cx)^2 + 2\,abx\arctan(cx) + a^2 x}{e^2 x^4 + 2\,dex^2 + d^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*x*arctan(c*x)^2 + 2*a*b*x*arctan(c*x) + a^2*x)/(e^2*x^4 + 2*d
*e*x^2 + d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [B] time = 1.05, size = 1185, normalized size = 2.59

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x)
```

```
[Out] -1/2*c^2*a^2/e/(c^2*e*x^2+c^2*d)-1/2*c^2*b^2/e/(c^2*e*x^2+c^2*d)*arctan(c*x
)^2+1/2*b^2/e*(c^2*e*d)^(1/2)/d/(c^2*d-e)*arctan(c*x)^2+I*c^2*b^2*ln(1-(c^2
*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^
2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)-1/2*I*c^4*b^2/e*ln(1-(c^2*d-
e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*arctan(c*x)/(c^2*d
-e)/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)*d+1/2*I*b^2/e*(c^2*e*d)^(1/2)/d
/(c^2*d-e)*arctan(c*x)*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^
2*e*d)^(1/2)-e))+c^2*b^2/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^2*(c
^2*e*d)^(1/2)+1/2*c^2*b^2/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*
d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*(c^2*e*d)^(1/2)-
1/2*I*b^2*e*ln(1-(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2
)-e))*arctan(c*x)/(c^2*d-e)/d/(c^4*d^2-2*c^2*d*e+e^2)*(c^2*e*d)^(1/2)+1/2*c
^2*b^2/e*arctan(c*x)^2/(c^2*d-e)+1/4*b^2/e*(c^2*e*d)^(1/2)/d/(c^2*d-e)*poly
log(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(-c^2*d+2*(c^2*e*d)^(1/2)-e))-1/2*b
^2*e/d/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*arctan(c*x)^2*(c^2*e*d)^(1/2)-1/4*
b^2*e/d/(c^2*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(
c^2*x^2+1)/(-c^2*d-2*(c^2*e*d)^(1/2)-e))*(c^2*e*d)^(1/2)-1/4*c^4*b^2/e/(c^2
*d-e)/(c^4*d^2-2*c^2*d*e+e^2)*polylog(2,(c^2*d-e)*(1+I*c*x)^2/(c^2*x^2+1)/(
-c^2*d-2*(c^2*e*d)^(1/2)-e))*(c^2*e*d)^(1/2)*d-1/2*c^4*b^2/e/(c^2*d-e)/(c^4
*d^2-2*c^2*d*e+e^2)*arctan(c*x)^2*(c^2*e*d)^(1/2)*d-c^2*a*b/e/(c^2*e*x^2+c^
2*d)*arctan(c*x)-c*a*b/(c^2*d-e)/(d*e)^(1/2)*arctan(e*x/(d*e)^(1/2))+c^2*a*
b/e/(c^2*d-e)*arctan(c*x)
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{x\,(a+b\,\mathrm{atan}\,(c\,x))^2}{\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((x*(a + b*atan(c*x))^2)/(d + e*x^2)^2,x)
```

```
[Out] int((x*(a + b*atan(c*x))^2)/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1271 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=1039

$$\frac{ic\text{Li}_2\left(1-\frac{2}{1-icx}\right)b^2}{2d\left(c^2d-e\right)}+\frac{ic\text{Li}_2\left(1-\frac{2}{icx+1}\right)b^2}{2d\left(c^2d-e\right)}-\frac{ic\text{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4d\left(c^2d-e\right)}-\frac{ic\text{Li}_2\left(1-\frac{2c\left(\sqrt{e}\,x+\sqrt{-d}\right)}{\left(\sqrt{-d}\,c+i\sqrt{e}\right)(1-icx)}\right)b^2}{4d\left(c^2d-e\right)}-\frac{\text{Li}_3\left(\right.}{}$$

```
[Out] 1/2*I*b^2*c*polylog(2,1-2/(1-I*c*x))/d/(c^2*d-e)-b*c*(a+b*arctan(c*x))*ln(2
/(1-I*c*x))/d/(c^2*d-e)+b*c*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/d/(c^2*d-e)+1
/2*b*c*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1
/2)-I*e^(1/2)))/d/(c^2*d-e)+1/2*b*c*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x*
e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d/(c^2*d-e)+1/4*I*b*(a+b*arcta
n(c*x))*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^
(1/2)))/(-d)^(3/2)/e^(1/2)-1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2
))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d/(c^2*d-e)-1/4*I*b*(a+b*arctan(c*x)
)*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2))
)/(-d)^(3/2)/e^(1/2)+1/2*I*c*(a+b*arctan(c*x))^2/d/(c^2*d-e)-1/4*(a+b*arcta
n(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))
/(-d)^(3/2)/e^(1/2)+1/4*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(
1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(3/2)/e^(1/2)+1/2*I*b^2*c*polylog(2
,1-2/(1+I*c*x))/d/(c^2*d-e)-1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/
2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d/(c^2*d-e)-1/8*b^2*polylog(3,1-2*c
*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/(-d)^(3/2)/e^(1
/2)+1/8*b^2*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+
I*e^(1/2)))/(-d)^(3/2)/e^(1/2)-1/4*(a+b*arctan(c*x))^2/d/e^(1/2)/((-d)^(1/2
)-x*e^(1/2))+1/4*(a+b*arctan(c*x))^2/d/e^(1/2)/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] time = 1.33, antiderivative size = 1039, normalized size of antiderivative = 1.00, number of steps used = 32, number of rules used = 11, integrand size = 20, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.550, Rules used = {4914, 4864, 4856, 2402, 2315, 2447, 4984, 4884, 4920, 4854, 4858}

$$\frac{ic\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)b^2}{2d\left(c^2d-e\right)}+\frac{ic\text{PolyLog}\left(2,1-\frac{2}{icx+1}\right)b^2}{2d\left(c^2d-e\right)}-\frac{ic\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4d\left(c^2d-e\right)}-\frac{ic\text{PolyLog}\left(\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(d + e*x^2)^2,x]
```

```
[Out] ((I/2)*c*(a + b*ArcTan[c*x])^2)/(d*(c^2*d - e)) - (a + b*ArcTan[c*x])^2/(4*
d*Sqrt[e]*(Sqrt[-d] - Sqrt[e]*x)) + (a + b*ArcTan[c*x])^2/(4*d*Sqrt[e]*(Sqr
t[-d] + Sqrt[e]*x)) - (b*c*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/(d*(c^2*
d - e)) + (b*c*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(d*(c^2*d - e)) + (b
*c*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sq
rt[e])*(1 - I*c*x))])/(2*d*(c^2*d - e)) - ((a + b*ArcTan[c*x])^2*Log[(2*c*(
Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(4*(-d)^(3/
2)*Sqrt[e]) + (b*c*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c
*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*d*(c^2*d - e)) + ((a + b*ArcTan[c*
x])^2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x
))])/(4*(-d)^(3/2)*Sqrt[e]) + ((I/2)*b^2*c*PolyLog[2, 1 - 2/(1 - I*c*x)])/(
d*(c^2*d - e)) + ((I/2)*b^2*c*PolyLog[2, 1 - 2/(1 + I*c*x)])/(d*(c^2*d - e)
) - ((I/4)*b^2*c*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] -
 I*Sqrt[e])*(1 - I*c*x))])/(d*(c^2*d - e)) + ((I/4)*b*(a + b*ArcTan[c*x])*P
olyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I
*c*x))])/((-d)^(3/2)*Sqrt[e]) - ((I/4)*b^2*c*PolyLog[2, 1 - (2*c*(Sqrt[-d]
```

```
+ Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(d*(c^2*d - e)) - ((
I/4)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*
Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/((-d)^(3/2)*Sqrt[e]) - (b^2*PolyLog[3,
 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/
(8*(-d)^(3/2)*Sqrt[e]) + (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/(
(c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(8*(-d)^(3/2)*Sqrt[e])
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4984

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx = \int \left(-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{4d\left(\sqrt{-d}\sqrt{e}-ex\right)^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{4d\left(\sqrt{-d}\sqrt{e}+ex\right)^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(-de-e^2x^2\right)}\right)dx$$

$$= -\frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(\sqrt{-d}\sqrt{e}-ex\right)^2}dx}{4d}-\frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(\sqrt{-d}\sqrt{e}+ex\right)^2}dx}{4d}-\frac{e\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{-de-e^2x^2}dx}{2d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{(bc)\int\left(\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)}{\left(-c^2d+e\right)\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{c^2\left(-\sqrt{-d}+\right.}{\sqrt{e}\left(-\right.}\right.}{2d}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}+\frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}-\sqrt{e}x}dx}{4(-d)^{3/2}}+\frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\sqrt{-d}+\sqrt{e}x}}{4(-d)^{3/2}}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d\left(c^2d-e\right)}+\frac{bc}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d\left(c^2d-e\right)}+\frac{bc}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d\left(c^2d-e\right)}+\frac{bc}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d\left(c^2d-e\right)}+\frac{bc}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d\left(c^2d-e\right)}+\frac{bc}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}-\sqrt{e}x\right)}+\frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d\sqrt{e}\left(\sqrt{-d}+\sqrt{e}x\right)}-\frac{bc\left(a+b\tan^{-1}(cx)\right)\log\left(\frac{2}{1-icx}\right)}{d\left(c^2d-e\right)}+\frac{bc}{}$$

Mathematica [**F**] time = 24.40, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(d + e*x^2)^2,x]
```

```
[Out] Integrate[(a + b*ArcTan[c*x])^2/(d + e*x^2)^2, x]
```

fricas [**F**] time = 0.58, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\arctan(cx)^2+2\,ab\arctan(cx)+a^2}{e^2x^4+2\,dex^2+d^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e^2*x^4 + 2*d*e*x^2
 + d^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 3.15, size = 6575, normalized size = 6.33

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/(e*x^2+d)^2,x)
```

```
[Out] result too large to display
```

maxima [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Timed out
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))^2}{\left(e\,x^2 + d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(d + e*x^2)^2,x)
```

```
[Out] int((a + b*atan(c*x))^2/(d + e*x^2)^2, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1272 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=1087

$$\frac{ic\sqrt{e}\,\text{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4(-d)^{3/2}\left(c^2d-e\right)}-\frac{ic\sqrt{e}\,\text{Li}_2\left(1-\frac{2c\left(\sqrt{e}\,x+\sqrt{-d}\right)}{\left(\sqrt{-d}\,c+i\sqrt{e}\right)(1-icx)}\right)b^2}{4(-d)^{3/2}\left(c^2d-e\right)}+\frac{\text{Li}_3\left(1-\frac{2}{1-icx}\right)b^2}{2d^2}-\frac{\text{Li}_3\left(1-\frac{2}{icx+1}\right)b^2}{2d^2}+\frac{\text{Li}_3\left(\right.}{}$$

```
[Out] -1/2*c^2*(a+b*arctan(c*x))^2/d/(c^2*d-e)-2*(a+b*arctan(c*x))^2*arctanh(-1+2
/(1+I*c*x))/d^2+(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/d^2-1/2*(a+b*arctan(c*x
))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2-
1/2*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/
2)+I*e^(1/2)))/d^2-I*b*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/d^2-I*b*(
a+b*arctan(c*x))*polylog(2,1-2/(1-I*c*x))/d^2+1/2*I*b*(a+b*arctan(c*x))*pol
ylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^2
+1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)
-I*e^(1/2)))*e^(1/2)/(-d)^(3/2)/(c^2*d-e)+I*b*(a+b*arctan(c*x))*polylog(2,-
1+2/(1+I*c*x))/d^2+1/2*b^2*polylog(3,1-2/(1-I*c*x))/d^2-1/2*b^2*polylog(3,1
-2/(1+I*c*x))/d^2+1/2*b^2*polylog(3,-1+2/(1+I*c*x))/d^2-1/4*b^2*polylog(3,1
-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2-1/4*b^2
*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))
/d^2-1/2*b*c*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(
-d)^(1/2)-I*e^(1/2)))*e^(1/2)/(-d)^(3/2)/(c^2*d-e)+1/2*b*c*(a+b*arctan(c*x)
)*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)
/(-d)^(3/2)/(c^2*d-e)-1/4*I*b^2*c*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1
-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(3/2)/(c^2*d-e)+1/2*I*b*(a+b
*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2
)-I*e^(1/2)))/d^2+1/4*(a+b*arctan(c*x))^2/d^2/(1-x*e^(1/2)/(-d)^(1/2))+1/4*
(a+b*arctan(c*x))^2/d^2/(1+x*e^(1/2)/(-d)^(1/2))
```

Rubi [A] time = 1.86, antiderivative size = 1087, normalized size of antiderivative = 1.00, number of steps used = 39, number of rules used = 16, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.696, Rules used = {4980, 4850, 4988, 4884, 4994, 6610, 4978, 4864, 4856, 2402, 2315, 2447, 4984, 4920, 4854, 4858}

$$\frac{ic\sqrt{e}\,\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}\,x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4(-d)^{3/2}\left(c^2d-e\right)}-\frac{ic\sqrt{e}\,\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{e}\,x+\sqrt{-d}\right)}{\left(\sqrt{-d}\,c+i\sqrt{e}\right)(1-icx)}\right)b^2}{4(-d)^{3/2}\left(c^2d-e\right)}+\frac{\text{PolyLog}\left(3,1-\frac{2}{1-icx}\right)b^2}{2d^2}-$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x*(d + e*x^2)^2),x]
```

```
[Out] -(c^2*(a + b*ArcTan[c*x])^2)/(2*d*(c^2*d - e)) + (a + b*ArcTan[c*x])^2/(4*d
^2*(1 - (Sqrt[e]*x)/Sqrt[-d])) + (a + b*ArcTan[c*x])^2/(4*d^2*(1 + (Sqrt[e]
*x)/Sqrt[-d])) + (2*(a + b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d^2 +
 ((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/d^2 - (b*c*Sqrt[e]*(a + b*ArcTa
n[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c
*x))])/(2*(-d)^(3/2)*(c^2*d - e)) - ((a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-
d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*d^2) + (b*c*Sq
rt[e]*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I
*Sqrt[e])*(1 - I*c*x))])/(2*(-d)^(3/2)*(c^2*d - e)) - ((a + b*ArcTan[c*x])^
2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])
/(2*d^2) - (I*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/d^2 - (I
*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 + I*c*x)])/d^2 + (I*b*(a + b*Arc
Tan[c*x])*PolyLog[2, -1 + 2/(1 + I*c*x)])/d^2 + ((I/4)*b^2*c*Sqrt[e]*PolyLo
```

```
g[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x)
)])/((-d)^(3/2)*(c^2*d - e)) + ((I/2)*b*(a + b*ArcTan[c*x])*PolyLog[2, 1 -
(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^2 -
 ((I/4)*b^2*c*Sqrt[e]*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[
-d] + I*Sqrt[e])*(1 - I*c*x))])/((-d)^(3/2)*(c^2*d - e)) + ((I/2)*b*(a + b*
ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*S
qrt[e])*(1 - I*c*x))])/d^2 + (b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*d^2) -
(b^2*PolyLog[3, 1 - 2/(1 + I*c*x)])/(2*d^2) + (b^2*PolyLog[3, -1 + 2/(1 + I
*c*x)])/(2*d^2) - (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt
[-d] - I*Sqrt[e])*(1 - I*c*x))])/(4*d^2) - (b^2*PolyLog[3, 1 - (2*c*(Sqrt[-
d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*d^2)
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
```

```
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4978

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2)^2
, x_Symbol] :> Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcTan[c*x])^p/(1 -
 Rt[-(e/d), 2]*x)^2, x], x] - Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcT
an[c*x])^p/(1 + Rt[-(e/d), 2]*x)^2, x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4984

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
```

```
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x\left(d+ex^2\right)^2}\,dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x} - \frac{ex\left(a+b\tan^{-1}(cx)\right)^2}{d\left(d+ex^2\right)^2} - \frac{ex\left(a+b\tan^{-1}(cx)\right)^2}{d^2\left(d+ex^2\right)}\right)dx$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx}{d^2} - \frac{e\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$= \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2} - \frac{(4bc)\int \frac{\left(a+b\tan^{-1}(cx)\right)\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{1+c^2x^2}\,dx}{d^2} + -$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1-\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1+\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1-\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1+\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1-\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1+\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

$$= \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1-\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1+\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{2\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^2}$$

$$= -\frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(c^2d-e\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1-\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + \frac{\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(1+\frac{\sqrt{e}\,x}{\sqrt{-d}}\right)} + 2\left(a+b\tan^{-1}\right.$$

Mathematica [F] time = 17.41, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x\left(d+ex^2\right)^2}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x*(d + e*x^2)^2),x]
[Out] Integrate[(a + b*ArcTan[c*x])^2/(x*(d + e*x^2)^2), x]
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2 \arctan\left(cx\right)^2 + 2\,ab \arctan\left(cx\right) + a^2}{e^2x^5 + 2\,dex^3 + d^2x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e^2*x^5 + 2*d*e*x^3
 + d^2*x), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 30.09, size = 0, normalized size = 0.00

$$\int \frac{\left(a + b \arctan\left(cx\right)\right)^2}{x\left(e\,x^2 + d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x/(e*x^2+d)^2,x)
```

```
[Out] int((a+b*arctan(c*x))^2/x/(e*x^2+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}\,a^2\left(\frac{1}{dex^2 + d^2} - \frac{\log\left(ex^2 + d\right)}{d^2} + \frac{2\,\log\left(x\right)}{d^2}\right) + \int \frac{b^2 \arctan\left(cx\right)^2 + 2\,ab \arctan\left(cx\right)}{e^2x^5 + 2\,dex^3 + d^2x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] 1/2*a^2*(1/(d*e*x^2 + d^2) - log(e*x^2 + d)/d^2 + 2*log(x)/d^2) + integrate
((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x))/(e^2*x^5 + 2*d*e*x^3 + d^2*x), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{\left(a + b \operatorname{atan}\left(c\,x\right)\right)^2}{x\left(e\,x^2 + d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x*(d + e*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1273 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=1141

$$-\frac{iceLi_2\left(1-\frac{2}{1-icx}\right)b^2}{2d^2\left(c^2d-e\right)}-\frac{icLi_2\left(\frac{2}{1-icx}-1\right)b^2}{d^2}-\frac{iceLi_2\left(1-\frac{2}{icx+1}\right)b^2}{2d^2\left(c^2d-e\right)}+\frac{iceLi_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4d^2\left(c^2d-e\right)}+\frac{iceLi_2\left(1-\right.}{4d}$$

```
[Out] -I*b^2*c*polylog(2,-1+2/(1-I*c*x))/d^2-1/2*I*c*e*(a+b*arctan(c*x))^2/d^2/(c
^2*d-e)-(a+b*arctan(c*x))^2/d^2/x+b*c*e*(a+b*arctan(c*x))*ln(2/(1-I*c*x))/d
^2/(c^2*d-e)-b*c*e*(a+b*arctan(c*x))*ln(2/(1+I*c*x))/d^2/(c^2*d-e)+2*b*c*(a
+b*arctan(c*x))*ln(2-2/(1-I*c*x))/d^2-1/2*b*c*e*(a+b*arctan(c*x))*ln(2*c*((
-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2/(c^2*d-e)-1/2*
b*c*e*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/
2)+I*e^(1/2)))/d^2/(c^2*d-e)-I*c*(a+b*arctan(c*x))^2/d^2-1/2*I*b^2*c*e*poly
log(2,1-2/(1+I*c*x))/d^2/(c^2*d-e)+1/4*I*b^2*c*e*polylog(2,1-2*c*((-d)^(1/2
)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^2/(c^2*d-e)+3/4*I*b*(a+b
*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2
)-I*e^(1/2)))*e^(1/2)/(-d)^(5/2)-3/4*I*b*(a+b*arctan(c*x))*polylog(2,1-2*c*
((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(5/
2)-3/4*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^
(1/2)-I*e^(1/2)))*e^(1/2)/(-d)^(5/2)+3/4*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(
1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(5/2)-1/2*
I*b^2*c*e*polylog(2,1-2/(1-I*c*x))/d^2/(c^2*d-e)+1/4*I*b^2*c*e*polylog(2,1-
2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^2/(c^2*d-e
)-3/8*b^2*polylog(3,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*
e^(1/2)))*e^(1/2)/(-d)^(5/2)+3/8*b^2*polylog(3,1-2*c*((-d)^(1/2)+x*e^(1/2))
/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))*e^(1/2)/(-d)^(5/2)+1/4*(a+b*arctan(c*x
))^2*e^(1/2)/d^2/((-d)^(1/2)-x*e^(1/2))-1/4*(a+b*arctan(c*x))^2*e^(1/2)/d^2
/((-d)^(1/2)+x*e^(1/2))
```

Rubi [A] time = 2.05, antiderivative size = 1141, normalized size of antiderivative = 1.00, number of steps used = 42, number of rules used = 15, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.652, Rules used = {4980, 4852, 4924, 4868, 2447, 4914, 4864, 4856, 2402, 2315, 4984, 4884, 4920, 4854, 4858}

$$-\frac{icePolyLog\left(2,1-\frac{2}{1-icx}\right)b^2}{2d^2\left(c^2d-e\right)}-\frac{icPolyLog\left(2,\frac{2}{1-icx}-1\right)b^2}{d^2}-\frac{icePolyLog\left(2,1-\frac{2}{icx+1}\right)b^2}{2d^2\left(c^2d-e\right)}+\frac{icePolyLog\left(2,1-\right.}{4d^2\left(c^2\right.}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^2*(d + e*x^2)^2),x]
```

```
[Out] ((-I)*c*(a + b*ArcTan[c*x])^2)/d^2 - ((I/2)*c*e*(a + b*ArcTan[c*x])^2)/(d^2
*(c^2*d - e)) - (a + b*ArcTan[c*x])^2/(d^2*x) + (Sqrt[e]*(a + b*ArcTan[c*x]
)^2)/(4*d^2*(Sqrt[-d] - Sqrt[e]*x)) - (Sqrt[e]*(a + b*ArcTan[c*x])^2)/(4*d^
2*(Sqrt[-d] + Sqrt[e]*x)) + (b*c*e*(a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/
(d^2*(c^2*d - e)) - (b*c*e*(a + b*ArcTan[c*x])*Log[2/(1 + I*c*x)])/(d^2*(c^
2*d - e)) - (b*c*e*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c
*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/(2*d^2*(c^2*d - e)) - (3*Sqrt[e]*(a +
 b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e]
)*(1 - I*c*x))])/(4*(-d)^(5/2)) - (b*c*e*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt
[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(2*d^2*(c^2*d -
 e)) + (3*Sqrt[e]*(a + b*ArcTan[c*x])^2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((
c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(4*(-d)^(5/2)) + (2*b*c*(a + b*ArcTa
n[c*x])*Log[2 - 2/(1 - I*c*x)])/d^2 - ((I/2)*b^2*c*e*PolyLog[2, 1 - 2/(1 -
```

```
I*c*x)])/(d^2*(c^2*d - e)) - (I*b^2*c*PolyLog[2, -1 + 2/(1 - I*c*x)])/d^2 -
 ((I/2)*b^2*c*e*PolyLog[2, 1 - 2/(1 + I*c*x)])/(d^2*(c^2*d - e)) + ((I/4)*b
^2*c*e*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e]
)*(1 - I*c*x))])/(d^2*(c^2*d - e)) + (((3*I)/4)*b*Sqrt[e]*(a + b*ArcTan[c*x
])*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1
 - I*c*x))])/(-d)^(5/2) + ((I/4)*b^2*c*e*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sq
rt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(d^2*(c^2*d - e)) - (((3
*I)/4)*b*Sqrt[e]*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e
]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(-d)^(5/2) - (3*b^2*Sqrt[e]*
PolyLog[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 -
I*c*x))])/(8*(-d)^(5/2)) + (3*b^2*Sqrt[e]*PolyLog[3, 1 - (2*c*(Sqrt[-d] + S
qrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/(8*(-d)^(5/2))
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
```

```
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4868

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))), x_
Symbol] :> Simp[((a + b*ArcTan[c*x])^p*Log[2 - 2/(1 + (e*x)/d)])/d, x] - Di
st[(b*c*p)/d, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2 - 2/(1 + (e*x)/d)])/(1
 + c^2*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d
^2 + e^2, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4914

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_) + (e_.)*(x_)^2)^(q_.), x
_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p, (d + e*x^2)^q, x], x
] /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[q] && IGtQ[p, 0]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4924

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_)^2)),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*d*(p + 1)), x] + Dist
[I/d, Int[(a + b*ArcTan[c*x])^p/(x*(I + c*x)), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && GtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4984

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
```

```
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2\left(d+ex^2\right)^2}\,dx=\int\left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d\left(d+ex^2\right)^2}-\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{d^2\left(d+ex^2\right)}\right)dx$$

$$=\frac{\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^2}\,dx}{d^2}-\frac{e\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}\,dx}{d^2}-\frac{e\int\frac{\left(a+b\tan^{-1}(cx)\right)^2}{\left(d+ex^2\right)^2}\,dx}{d}$$

$$=-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{(2bc)\int\frac{a+b\tan^{-1}(cx)}{x\left(1+c^2x^2\right)}\,dx}{d^2}-\frac{e\int\left(\frac{\sqrt{-d}\left(a+b\tan^{-1}(cx)\right)^2}{2d\left(\sqrt{-d}-\sqrt{e}\,x\right)}+\frac{\sqrt{-d}\left(a+b\tan^{-1}(\cdots\right.}{2d\left(\sqrt{-d}+\sqrt{e}\,x\cdots\right.}\right.}{d^2}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{(2ibc)\int\frac{a+b\tan^{-1}(cx)}{x(i+cx)}\,dx}{d^2}+\frac{e\int\frac{\left(a+b\tan^{-1}(c\cdots\right.}{\sqrt{-d}-\sqrt{e}\cdots}}{2(-d)^{5/2}\cdots}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

$$=-\frac{ic\left(a+b\tan^{-1}(cx)\right)^2}{d^2}-\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x}+\frac{\sqrt{e}\left(a+b\tan^{-1}(cx)\right)^2}{4d^2\left(\sqrt{-d}-\sqrt{e}\,x\right)}-\frac{\sqrt{e}\left(a+b\tan\cdots\right.}{4d^2\left(\sqrt{-d}+\cdots\right.}$$

Mathematica [F] time = 180.00, size = 0, normalized size = 0.00

$Aborted

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^2*(d + e*x^2)^2),x]
```

```
[Out] $Aborted
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\arctan\left(cx\right)^2+2\,ab\arctan\left(cx\right)+a^2}{e^2x^6+2\,dex^4+d^2x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x^2+d)^2,x, algorithm="fricas")
```

```
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e^2*x^6 + 2*d*e*x^4
 + d^2*x^2), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x^2+d)^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 8.37, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\arctan\left(cx\right)\right)^2}{x^2\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^2/(e*x^2+d)^2,x)
```

```
[Out] int((a+b*arctan(c*x))^2/x^2/(e*x^2+d)^2,x)
```

maxima [F(-2)] time = 0.00, size = 0, normalized size = 0.00

Exception raised: RuntimeError

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^2/(e*x^2+d)^2,x, algorithm="maxima")
```

```
[Out] Exception raised: RuntimeError >> ECL says: THROW: The catch RAT-ERR is und
efined.
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int\frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)^2}{x^2\,\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^2*(d + e*x^2)^2),x)
```

```
[Out] int((a + b*atan(c*x))^2/(x^2*(d + e*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**2/(e*x**2+d)**2,x)
```

```
[Out] Timed out
```

3.1274 $\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3\left(d+ex^2\right)^2}\,dx$

Optimal. Leaf size=1181

$$\frac{c^2\log(x)b^2}{d^2}-\frac{c^2\log\left(c^2x^2+1\right)b^2}{2d^2}+\frac{ice^{3/2}\text{Li}_2\left(1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4(-d)^{5/2}\left(c^2d-e\right)}-\frac{ice^{3/2}\text{Li}_2\left(1-\frac{2c\left(\sqrt{e}x+\sqrt{-d}\right)}{\left(\sqrt{-d}c+i\sqrt{e}\right)(1-icx)}\right)b^2}{4(-d)^{5/2}\left(c^2d-e\right)}-\frac{e\text{Li}_3}{}$$

```
[Out] -1/2*c^2*(a+b*arctan(c*x))^2/d^2-1/2*(a+b*arctan(c*x))^2/d^2/x^2+b^2*c^2*ln
(x)/d^2-1/2*b^2*c^2*ln(c^2*x^2+1)/d^2+1/2*b^2*e*polylog(3,1-2*c*((-d)^(1/2)
-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^3+1/2*b^2*e*polylog(3,1-2
*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/d^3-1/4*e*(a+
b*arctan(c*x))^2/d^3/(1-x*e^(1/2)/(-d)^(1/2))-1/4*e*(a+b*arctan(c*x))^2/d^3
/(1+x*e^(1/2)/(-d)^(1/2))-2*e*(a+b*arctan(c*x))^2*ln(2/(1-I*c*x))/d^3+e*(a+
b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^
(1/2)))/d^3+e*(a+b*arctan(c*x))^2*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(
c*(-d)^(1/2)+I*e^(1/2)))/d^3-b*c*(a+b*arctan(c*x))/d^2/x+1/2*c^2*e*(a+b*arc
tan(c*x))^2/d^2/(c^2*d-e)-I*b*e*(a+b*arctan(c*x))*polylog(2,1-2*c*((-d)^(1/
2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/d^3-I*b*e*(a+b*arctan(c*x
))*polylog(2,1-2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)
))/d^3+4*e*(a+b*arctan(c*x))^2*arctanh(-1+2/(1+I*c*x))/d^3+1/4*I*b^2*c*e^(3
/2)*polylog(2,1-2*c*((-d)^(1/2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2
)))/(-d)^(5/2)/(c^2*d-e)-1/2*b*c*e^(3/2)*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/
2)-x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)-I*e^(1/2)))/(-d)^(5/2)/(c^2*d-e)+1/2*
b*c*e^(3/2)*(a+b*arctan(c*x))*ln(2*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-
d)^(1/2)+I*e^(1/2)))/(-d)^(5/2)/(c^2*d-e)-1/4*I*b^2*c*e^(3/2)*polylog(2,1-2
*c*((-d)^(1/2)+x*e^(1/2))/(1-I*c*x)/(c*(-d)^(1/2)+I*e^(1/2)))/(-d)^(5/2)/(c
^2*d-e)-b^2*e*polylog(3,1-2/(1-I*c*x))/d^3+b^2*e*polylog(3,1-2/(1+I*c*x))/d
^3-b^2*e*polylog(3,-1+2/(1+I*c*x))/d^3+2*I*b*e*(a+b*arctan(c*x))*polylog(2,
1-2/(1-I*c*x))/d^3+2*I*b*e*(a+b*arctan(c*x))*polylog(2,1-2/(1+I*c*x))/d^3-2
*I*b*e*(a+b*arctan(c*x))*polylog(2,-1+2/(1+I*c*x))/d^3
```

Rubi [A] time = 2.02, antiderivative size = 1181, normalized size of antiderivative = 1.00, number of steps used = 47, number of rules used = 22, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.956, Rules used = {4980, 4852, 4918, 266, 36, 29, 31, 4884, 4850, 4988, 4994, 6610, 4978, 4864, 4856, 2402, 2315, 2447, 4984, 4920, 4854, 4858}

$$\frac{c^2\log(x)b^2}{d^2}-\frac{c^2\log\left(c^2x^2+1\right)b^2}{2d^2}+\frac{ice^{3/2}\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-d}-\sqrt{e}x\right)}{\left(c\sqrt{-d}-i\sqrt{e}\right)(1-icx)}\right)b^2}{4(-d)^{5/2}\left(c^2d-e\right)}-\frac{ice^{3/2}\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{e}x+\sqrt{}\right.}{\left(\sqrt{-d}c+i\sqrt{e}\right)}\right.}{4(-d)^{5/2}\left(c^2d-e\right)}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])^2/(x^3*(d + e*x^2)^2),x]
```

```
[Out] -((b*c*(a + b*ArcTan[c*x]))/(d^2*x)) - (c^2*(a + b*ArcTan[c*x])^2)/(2*d^2)
+ (c^2*e*(a + b*ArcTan[c*x])^2)/(2*d^2*(c^2*d - e)) - (a + b*ArcTan[c*x])^2
/(2*d^2*x^2) - (e*(a + b*ArcTan[c*x])^2)/(4*d^3*(1 - (Sqrt[e]*x)/Sqrt[-d]))
 - (e*(a + b*ArcTan[c*x])^2)/(4*d^3*(1 + (Sqrt[e]*x)/Sqrt[-d])) - (4*e*(a +
 b*ArcTan[c*x])^2*ArcTanh[1 - 2/(1 + I*c*x)])/d^3 + (b^2*c^2*Log[x])/d^2 -
(2*e*(a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/d^3 - (b*c*e^(3/2)*(a + b*Ar
cTan[c*x])*Log[(2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 -
I*c*x))])/(2*(-d)^(5/2)*(c^2*d - e)) + (e*(a + b*ArcTan[c*x])^2*Log[(2*c*(S
qrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^3 + (b*c*e
^(3/2)*(a + b*ArcTan[c*x])*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] +
I*Sqrt[e])*(1 - I*c*x))])/(2*(-d)^(5/2)*(c^2*d - e)) + (e*(a + b*ArcTan[c*x
```

```
])^2*Log[(2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x)
)])/d^3 - (b^2*c^2*Log[1 + c^2*x^2])/(2*d^2) + ((2*I)*b*e*(a + b*ArcTan[c*x
])*PolyLog[2, 1 - 2/(1 - I*c*x)])/d^3 + ((2*I)*b*e*(a + b*ArcTan[c*x])*Poly
Log[2, 1 - 2/(1 + I*c*x)])/d^3 - ((2*I)*b*e*(a + b*ArcTan[c*x])*PolyLog[2,
-1 + 2/(1 + I*c*x)])/d^3 + ((I/4)*b^2*c*e^(3/2)*PolyLog[2, 1 - (2*c*(Sqrt[-
d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/((-d)^(5/2)*(c^2*
d - e)) - (I*b*e*(a + b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(Sqrt[-d] - Sqrt[e
]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x))])/d^3 - ((I/4)*b^2*c*e^(3/2)*P
olyLog[2, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I
*c*x))])/((-d)^(5/2)*(c^2*d - e)) - (I*b*e*(a + b*ArcTan[c*x])*PolyLog[2, 1
 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-d] + I*Sqrt[e])*(1 - I*c*x))])/d^
3 - (b^2*e*PolyLog[3, 1 - 2/(1 - I*c*x)])/d^3 + (b^2*e*PolyLog[3, 1 - 2/(1
+ I*c*x)])/d^3 - (b^2*e*PolyLog[3, -1 + 2/(1 + I*c*x)])/d^3 + (b^2*e*PolyLo
g[3, 1 - (2*c*(Sqrt[-d] - Sqrt[e]*x))/((c*Sqrt[-d] - I*Sqrt[e])*(1 - I*c*x)
)])/(2*d^3) + (b^2*e*PolyLog[3, 1 - (2*c*(Sqrt[-d] + Sqrt[e]*x))/((c*Sqrt[-
d] + I*Sqrt[e])*(1 - I*c*x))])/(2*d^3)
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4850

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)/(x_), x_Symbol] :> Simp[2*(a +
b*ArcTan[c*x])^p*ArcTanh[1 - 2/(1 + I*c*x)], x] - Dist[2*b*c*p, Int[((a + b
```

```
*ArcTan[c*x])^(p - 1)*ArcTanh[1 - 2/(1 + I*c*x)])/(1 + c^2*x^2), x], x] /;
FreeQ[{a, b, c}, x] && IGtQ[p, 1]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4854

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)), x_Symbol]
 :> -Simp[((a + b*ArcTan[c*x])^p*Log[2/(1 + (e*x)/d)])/e, x] + Dist[(b*c*p)
/e, Int[((a + b*ArcTan[c*x])^(p - 1)*Log[2/(1 + (e*x)/d)])/(1 + c^2*x^2), x
], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[c^2*d^2 + e^2, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4858

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^2/((d_) + (e_.)*(x_)), x_Symbol] :>
-Simp[((a + b*ArcTan[c*x])^2*Log[2/(1 - I*c*x)])/e, x] + (Simp[((a + b*ArcT
an[c*x])^2*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x] + Simp[(I*
b*(a + b*ArcTan[c*x])*PolyLog[2, 1 - 2/(1 - I*c*x)])/e, x] - Simp[(I*b*(a +
 b*ArcTan[c*x])*PolyLog[2, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/
e, x] - Simp[(b^2*PolyLog[3, 1 - 2/(1 - I*c*x)])/(2*e), x] + Simp[(b^2*Poly
Log[3, 1 - (2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/(2*e), x]) /; FreeQ[
{a, b, c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4864

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_)*((d_) + (e_.)*(x_))^(q_.), x_Sy
mbol] :> Simp[((d + e*x)^(q + 1)*(a + b*ArcTan[c*x])^p)/(e*(q + 1)), x] - D
ist[(b*c*p)/(e*(q + 1)), Int[ExpandIntegrand[(a + b*ArcTan[c*x])^(p - 1), (
d + e*x)^(q + 1)/(1 + c^2*x^2), x], x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 1] && IntegerQ[q] && NeQ[q, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 4920

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^(p + 1))/(b*e*(p + 1)), x] - Dist
[1/(c*d), Int[(a + b*ArcTan[c*x])^p/(I - c*x), x], x] /; FreeQ[{a, b, c, d,
 e}, x] && EqQ[e, c^2*d] && IGtQ[p, 0]
```

Rule 4978

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*(x_))/((d_) + (e_.)*(x_)^2)^2
, x_Symbol] :> Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcTan[c*x])^p/(1 -
 Rt[-(e/d), 2]*x)^2, x], x] - Dist[1/(4*d^2*Rt[-(e/d), 2]), Int[(a + b*ArcT
an[c*x])^p/(1 + Rt[-(e/d), 2]*x)^2, x], x] /; FreeQ[{a, b, c, d, e}, x] &&
IGtQ[p, 0]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 4984

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_) + (g_.)*(x_))^(m_.))/((
d_) + (e_.)*(x_)^2), x_Symbol] :> Int[ExpandIntegrand[(a + b*ArcTan[c*x])^p
/(d + e*x^2), (f + g*x)^m, x], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGt
Q[p, 0] && EqQ[e, c^2*d] && IGtQ[m, 0]
```

Rule 4988

```
Int[(ArcTanh[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x
_)^2), x_Symbol] :> Dist[1/2, Int[(Log[1 + u]*(a + b*ArcTan[c*x])^p)/(d + e
*x^2), x], x] - Dist[1/2, Int[(Log[1 - u]*(a + b*ArcTan[c*x])^p)/(d + e*x^2
), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*d] && Eq
Q[u^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 4994

```
Int[(Log[u_]*((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.))/((d_) + (e_.)*(x_)^2
), x_Symbol] :> -Simp[(I*(a + b*ArcTan[c*x])^p*PolyLog[2, 1 - u])/(2*c*d),
x] + Dist[(b*p*I)/2, Int[((a + b*ArcTan[c*x])^(p - 1)*PolyLog[2, 1 - u])/(d
 + e*x^2), x], x] /; FreeQ[{a, b, c, d, e}, x] && IGtQ[p, 0] && EqQ[e, c^2*
d] && EqQ[(1 - u)^2 - (1 - (2*I)/(I - c*x))^2, 0]
```

Rule 6610

```
Int[(u_)*PolyLog[n_, v_], x_Symbol] :> With[{w = DerivativeDivides[v, u*v,
x]}, Simp[w*PolyLog[n + 1, v], x] /;  !FalseQ[w]] /; FreeQ[n, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3\left(d+ex^2\right)^2}dx = \int \left(\frac{\left(a+b\tan^{-1}(cx)\right)^2}{d^2x^3} - \frac{2e\left(a+b\tan^{-1}(cx)\right)^2}{d^3x} + \frac{e^2x\left(a+b\tan^{-1}(cx)\right)^2}{d^2\left(d+ex^2\right)^2} + \frac{2e^2x\left(a\right.}{d^3}\right.$$

$$= \frac{\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3}dx}{d^2} - \frac{(2e)\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x}dx}{d^3} + \frac{\left(2e^2\right)\int \frac{x\left(a+b\tan^{-1}(cx)\right)^2}{d+ex^2}dx}{d^3} + \frac{e^2\int \frac{x(}{}}{}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2x^2} - \frac{4e\left(a+b\tan^{-1}(cx)\right)^2\tanh^{-1}\left(1-\frac{2}{1+icx}\right)}{d^3} + \frac{(bc)\int \frac{a+b\tan^{-1}(cx)}{x^2\left(1+c^2x^2\right)}}{d^2}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2x^2} - \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{4d^3\left(1-\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{e\left(a+b\tan^{-1}(cx)\right)^2}{4d^3\left(1+\frac{\sqrt{e}x}{\sqrt{-d}}\right)} - \frac{4e\left(a+b\tan^{-1}\right.}{}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2x^2} - \frac{e\left(a+b\tan^{-1}\right.}{4d^3\left(1-\right.}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2x^2} - \frac{e\left(a+b\tan^{-1}\right.}{4d^3\left(1-\right.}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} - \frac{\left(a+b\tan^{-1}(cx)\right)^2}{2d^2x^2} - \frac{e\left(a+b\tan^{-1}\right.}{4d^3\left(1-\right.}$$

$$= -\frac{bc\left(a+b\tan^{-1}(cx)\right)}{d^2x} - \frac{c^2\left(a+b\tan^{-1}(cx)\right)^2}{2d^2} + \frac{c^2e\left(a+b\tan^{-1}(cx)\right)^2}{2d^2\left(c^2d-e\right)} - \frac{\left(a+b\tan\right.}{2d^2}$$

Mathematica [F] time = 32.76, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)^2}{x^3\left(d+ex^2\right)^2}dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(a + b*ArcTan[c*x])^2/(x^3*(d + e*x^2)^2),x]
[Out] Integrate[(a + b*ArcTan[c*x])^2/(x^3*(d + e*x^2)^2), x]
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{b^2\arctan(cx)^2 + 2ab\arctan(cx) + a^2}{e^2x^7 + 2dex^5 + d^2x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x^2+d)^2,x, algorithm="fricas")
[Out] integral((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x) + a^2)/(e^2*x^7 + 2*d*e*x^5
 + d^2*x^3), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x^2+d)^2,x, algorithm="giac")
[Out] Timed out
```

maple [F] time = 56.76, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arctan(cx))^2}{x^3\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))^2/x^3/(e*x^2+d)^2,x)
[Out] int((a+b*arctan(c*x))^2/x^3/(e*x^2+d)^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\,a^2\left(\frac{2\,ex^2+d}{d^2ex^4+d^3x^2}-\frac{2\,e\log\left(ex^2+d\right)}{d^3}+\frac{4\,e\log(x)}{d^3}\right)+\int \frac{b^2\arctan(cx)^2+2\,ab\arctan(cx)}{e^2x^7+2\,dex^5+d^2x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))^2/x^3/(e*x^2+d)^2,x, algorithm="maxima")
[Out] -1/2*a^2*((2*e*x^2 + d)/(d^2*e*x^4 + d^3*x^2) - 2*e*log(e*x^2 + d)/d^3 + 4*
e*log(x)/d^3) + integrate((b^2*arctan(c*x)^2 + 2*a*b*arctan(c*x))/(e^2*x^7
+ 2*d*e*x^5 + d^2*x^3), x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))^2}{x^3\left(e\,x^2+d\right)^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))^2/(x^3*(d + e*x^2)^2),x)
[Out] int((a + b*atan(c*x))^2/(x^3*(d + e*x^2)^2), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))**2/x**3/(e*x**2+d)**2,x)
[Out] Timed out
```

3.1275 $\int x^4 \tan^{-1}(x) \log \left(1 + x^2\right) dx$

Optimal. Leaf size=111

$$-\frac{2}{25}x^5\tan^{-1}(x)+\frac{9x^4}{200}+\frac{2}{15}x^3\tan^{-1}(x)-\frac{77x^2}{300}-\frac{1}{20}\log^2\left(x^2+1\right)+\frac{1}{10}x^2\log\left(x^2+1\right)+\frac{137}{300}\log\left(x^2+1\right)+\frac{1}{5}x^5\log$$

```
[Out] -77/300*x^2+9/200*x^4-2/5*x*arctan(x)+2/15*x^3*arctan(x)-2/25*x^5*arctan(x)
+1/5*arctan(x)^2+137/300*ln(x^2+1)+1/10*x^2*ln(x^2+1)-1/20*x^4*ln(x^2+1)+1/
5*x^5*arctan(x)*ln(x^2+1)-1/20*ln(x^2+1)^2
```

Rubi [A] time = 0.44, antiderivative size = 111, normalized size of antiderivative = 1.00, number of steps used = 24, number of rules used = 14, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.167, Rules used = {4852, 266, 43, 5021, 6725, 446, 77, 4916, 4846, 260, 4884, 2475, 2390, 2301}

$$\frac{9x^4}{200}-\frac{77x^2}{300}-\frac{1}{20}\log^2\left(x^2+1\right)-\frac{1}{20}x^4\log\left(x^2+1\right)+\frac{1}{10}x^2\log\left(x^2+1\right)+\frac{137}{300}\log\left(x^2+1\right)-\frac{2}{25}x^5\tan^{-1}(x)+\frac{2}{15}x^3\text{ta}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (-77*x^2)/300 + (9*x^4)/200 - (2*x*ArcTan[x])/5 + (2*x^3*ArcTan[x])/15 - (2
*x^5*ArcTan[x])/25 + ArcTan[x]^2/5 + (137*Log[1 + x^2])/300 + (x^2*Log[1 +
x^2])/10 - (x^4*Log[1 + x^2])/20 + (x^5*ArcTan[x]*Log[1 + x^2])/5 - Log[1 +
 x^2]^2/20
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 77

```
Int[((a_.) + (b_.)*(x_))*((c_) + (d_.)*(x_))^(n_.)*((e_.) + (f_.)*(x_))^(p_
.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)*(c + d*x)^n*(e + f*x)^p, x],
 x] /; FreeQ[{a, b, c, d, e, f, n}, x] && NeQ[b*c - a*d, 0] && ((ILtQ[n, 0]
 && ILtQ[p, 0]) || EqQ[p, 1] || (IGtQ[p, 0] && ( !IntegerQ[n] || LeQ[9*p +
5*(n + 2), 0] || GeQ[n + p + 1, 0] || (GeQ[n + p + 2, 0] && RationalQ[a, b,
 c, d, e, f]))))
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
```

```
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int x^4 \tan^{-1}(x) \log\left(1+x^2\right) dx = \frac{1}{10}x^2 \log\left(1+x^2\right) - \frac{1}{20}x^4 \log\left(1+x^2\right) + \frac{1}{5}x^5 \tan^{-1}(x) \log\left(1+x^2\right) - \frac{1}{10}\log^2$$

$$= \frac{1}{10}x^2 \log\left(1+x^2\right) - \frac{1}{20}x^4 \log\left(1+x^2\right) + \frac{1}{5}x^5 \tan^{-1}(x) \log\left(1+x^2\right) - \frac{1}{10}\log^2$$

$$= \frac{1}{10}x^2 \log\left(1+x^2\right) - \frac{1}{20}x^4 \log\left(1+x^2\right) + \frac{1}{5}x^5 \tan^{-1}(x) \log\left(1+x^2\right) - \frac{1}{10}\log^2$$

$$= \frac{1}{10}x^2 \log\left(1+x^2\right) - \frac{1}{20}x^4 \log\left(1+x^2\right) + \frac{1}{5}x^5 \tan^{-1}(x) \log\left(1+x^2\right) - \frac{1}{10}\log^2$$

$$= \frac{1}{10}x^2 \log\left(1+x^2\right) - \frac{1}{20}x^4 \log\left(1+x^2\right) + \frac{1}{5}x^5 \tan^{-1}(x) \log\left(1+x^2\right) - \frac{1}{20}\log^2$$

$$= -\frac{2}{25}x^5 \tan^{-1}(x) + \frac{1}{10}x^2 \log\left(1+x^2\right) - \frac{1}{20}x^4 \log\left(1+x^2\right) + \frac{1}{5}x^5 \tan^{-1}(x) \log($$

$$= -\frac{3x^2}{20} + \frac{x^4}{40} + \frac{2}{15}x^3 \tan^{-1}(x) - \frac{2}{25}x^5 \tan^{-1}(x) + \frac{3}{20}\log\left(1+x^2\right) + \frac{1}{10}x^2 \log($$

$$= -\frac{3x^2}{20} + \frac{x^4}{40} - \frac{2}{5}x \tan^{-1}(x) + \frac{2}{15}x^3 \tan^{-1}(x) - \frac{2}{25}x^5 \tan^{-1}(x) + \frac{1}{5}\tan^{-1}(x)^2 +$$

$$= -\frac{19x^2}{100} + \frac{9x^4}{200} - \frac{2}{5}x \tan^{-1}(x) + \frac{2}{15}x^3 \tan^{-1}(x) - \frac{2}{25}x^5 \tan^{-1}(x) + \frac{1}{5}\tan^{-1}(x)^2$$

$$= -\frac{77x^2}{300} + \frac{9x^4}{200} - \frac{2}{5}x \tan^{-1}(x) + \frac{2}{15}x^3 \tan^{-1}(x) - \frac{2}{25}x^5 \tan^{-1}(x) + \frac{1}{5}\tan^{-1}(x)^2$$

Mathematica [A] time = 0.03, size = 79, normalized size = 0.71

$$\frac{1}{600}\left(\left(27x^2-154\right)x^2 - 30\log^2\left(x^2+1\right) + \left(-30x^4+60x^2+274\right)\log\left(x^2+1\right) + 8x\left(-6x^4+10x^2+15x^4\log\left(x\right.\right.\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (x^2*(-154 + 27*x^2) + 120*ArcTan[x]^2 + (274 + 60*x^2 - 30*x^4)*Log[1 + x^
2] - 30*Log[1 + x^2]^2 + 8*x*ArcTan[x]*(-30 + 10*x^2 - 6*x^4 + 15*x^4*Log[1
 + x^2]))/600
```

fricas [A] time = 0.39, size = 72, normalized size = 0.65

$$\frac{9}{200}x^4 - \frac{77}{300}x^2 - \frac{2}{75}\left(3x^5 - 5x^3 + 15x\right)\arctan(x) + \frac{1}{5}\arctan(x)^2 + \frac{1}{300}\left(60x^5\arctan(x) - 15x^4 + 30x^2 + 137\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(x)*log(x^2+1),x, algorithm="fricas")
```

```
[Out] 9/200*x^4 - 77/300*x^2 - 2/75*(3*x^5 - 5*x^3 + 15*x)*arctan(x) + 1/5*arctan
(x)^2 + 1/300*(60*x^5*arctan(x) - 15*x^4 + 30*x^2 + 137)*log(x^2 + 1) - 1/2
0*log(x^2 + 1)^2
```

giac [A] time = 4.70, size = 168, normalized size = 1.51

$$\frac{1}{10}\pi x^5\log\left(x^2+1\right)\text{sgn}(x)-\frac{1}{5}x^5\arctan\left(\frac{1}{x}\right)\log\left(x^2+1\right)-\frac{1}{25}\pi x^5\text{sgn}(x)+\frac{2}{25}x^5\arctan\left(\frac{1}{x}\right)-\frac{1}{20}x^4\log\left(x^2+1\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(x)*log(x^2+1),x, algorithm="giac")
```

```
[Out] 1/10*pi*x^5*log(x^2 + 1)*sgn(x) - 1/5*x^5*arctan(1/x)*log(x^2 + 1) - 1/25*p
i*x^5*sgn(x) + 2/25*x^5*arctan(1/x) - 1/20*x^4*log(x^2 + 1) + 1/15*pi*x^3*s
gn(x) + 9/200*x^4 - 2/15*x^3*arctan(1/x) + 1/10*x^2*log(x^2 + 1) - 3/10*pi^
2*sgn(x) - 1/5*pi*x*sgn(x) - 1/5*pi*arctan(1/x)*sgn(x) + 1/10*pi^2 - 77/300
*x^2 + 1/5*pi*arctan(x) + 1/5*pi*arctan(1/x) + 2/5*x*arctan(1/x) + 1/5*arct
an(1/x)^2 - 1/20*log(x^2 + 1)^2 + 137/300*log(x^2 + 1)
```

maple [C] time = 3.78, size = 3626, normalized size = 32.67

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*arctan(x)*ln(x^2+1),x)
```

```
[Out] -2/5*x*arctan(x)+2/15*x^3*arctan(x)-2/25*x^5*arctan(x)+1/10*I*csgn(I*(1+I*x
)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*
Pi*x^5-1/10*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*arc
tan(x)*Pi*x^5+1/10*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*cs
gn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^5+1/10*I*csgn(I*((1+I*x)^2/(x^
2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^5-1/5*I*csgn(I*((
1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi*x^5+1/4
0*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1
)^2)*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*Pi*x^4-1/20*I*csgn(I*(1+I*x)^2/(x^2+1)
)*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I/((1+I*x)^2/(x^2+
1)+1)^2)*Pi*x^2+1/5*I*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1
/2))*arctan(x)*Pi*x^5-1/10*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I/((1+I*x)^2/(
x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/
(x^2+1)+1)^2)+1/5*x^2*ln(2)-1/5*ln((1+I*x)^2/(x^2+1)+1)*x^2+1/10*ln((1+I*x)
^2/(x^2+1)+1)*x^4+46/75*I*arctan(x)+1/10*(-4*I*arctan(x)+4*x^5*arctan(x)+4*
ln((1+I*x)^2/(x^2+1)+1)+3+2*x^2-x^4)*ln((1+I*x)/(x^2+1)^(1/2))-181/600-1/10
*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*Pi-1/10*csgn(I*(1+I*x)^2/(x^2+1)/((1
+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi+1/10*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3
*arctan(x)*Pi+2/5*ln(2)*arctan(x)*x^5-3/40*I*Pi*csgn(I*(1+I*x)^2/(x^2+1)/((
1+I*x)^2/(x^2+1)+1)^2)^3+3/40*I*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3-3/40*I
*Pi*csgn(I*(1+I*x)^2/(x^2+1))^3-2/5*I*ln(2)*arctan(x)-2/5*ln((1+I*x)^2/(x^2
+1)+1)*arctan(x)*x^5+1/5*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)
^(1/2))*arctan(x)*Pi+1/10*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1
)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi-1/10*csgn(I*(1+I*x)^2/(x^2+1))*cs
gn(I*(1+I*x)/(x^2+1)^(1/2))^2*arctan(x)*Pi+1/10*csgn(I*(1+I*x)^2/(x^2+1)/((
1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi+1/10*
csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*P
i-1/5*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*arcta
n(x)*Pi+3/20*I*Pi*csgn(I*(1+I*x)/(x^2+1)^(1/2))*csgn(I*(1+I*x)^2/(x^2+1))^2
-3/20*I*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2+
1/40*I*csgn(I*(1+I*x)^2/(x^2+1))^3*Pi*x^4+1/40*I*csgn(I*(1+I*x)^2/(x^2+1)/(
(1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x^4-1/40*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*P
i*x^4-1/20*I*csgn(I*(1+I*x)^2/(x^2+1))^3*Pi*x^2-1/20*I*csgn(I*(1+I*x)^2/(x^
2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x^2+1/20*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^
2)^3*Pi*x^2+2/5*ln(2)*ln((1+I*x)^2/(x^2+1)+1)-1/10*ln(2)*x^4-1/10*I*csgn(I*
(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I
/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^5+3/40*I*Pi*csgn(I*((1+I*x)^2/(x^2
```

```
+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)+3/40*I*Pi*csgn(I/((1+I*x)^2/(x^2+
1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2-3/40*I*Pi*csgn
(I*(1+I*x)/(x^2+1)^(1/2))^2*csgn(I*(1+I*x)^2/(x^2+1))+3/40*I*Pi*csgn(I*(1+I
*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2-1/10*I*l
n((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*(1+I*x)^2/(x^2+1))^3+1/10*I*ln((1+I*x)^2/(
x^2+1)+1)*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3-1/10*I*ln((1+I*x)^2/(x^2+1)+
1)*Pi*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3+1/10*I*ln((1+I*x)
^2/(x^2+1)+1)*Pi*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/(
(1+I*x)^2/(x^2+1)+1)^2)^2+1/10*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*(1+I*x)^
2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2-1/5*I*ln((1+
I*x)^2/(x^2+1)+1)*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1
)+1)^2)^2-1/10*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2
*csgn(I*(1+I*x)^2/(x^2+1))-1/40*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^
2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x^4+1/40*I*csgn(I*(1+I*x)^2/(x^2+1)
)*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*x^4-1/40*I*csgn(I*(1+I*x)^2/(x^2+1)/((
1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*Pi*x^4-1/40*I*csgn
(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*Pi*x^4+1/20*I*c
sgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^
2*Pi*x^2-1/10*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2
/(x^2+1)+1)^2)*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi+1/20*I*csgn(I*(
1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)
*Pi*x^2+1/20*I*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)
^2)*Pi*x^2-1/10*I*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1
)^2)^2*Pi*x^2-3/40*I*Pi*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x
^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)-1/10*I*csgn(I*(1+I
*x)^2/(x^2+1))^3*arctan(x)*Pi*x^5-1/10*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^
2/(x^2+1)+1)^2)^3*arctan(x)*Pi*x^5+1/10*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3
*arctan(x)*Pi*x^5-1/20*I*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)
^(1/2))*Pi*x^4+1/5*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*(1+I*x)/(x^2+1)^(1/2
))*csgn(I*(1+I*x)^2/(x^2+1))^2+1/10*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*((1
+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)+1/20*I*csgn(I*((1+I*x
)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x^4+1/10*I*csgn(I*(1+I
*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*Pi*x^2-1/20*I*csgn(I*(1+I*x)
^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*x^2-77/300*x^2+3/10*ln(2)-13
7/150*ln((1+I*x)^2/(x^2+1)+1)-1/5*ln((1+I*x)^2/(x^2+1)+1)^2+9/200*x^4
```

maxima [A] time = 0.42, size = 80, normalized size = 0.72

$$\frac{9}{200}\,x^4-\frac{77}{300}\,x^2+\frac{1}{75}\left(15\,x^5\log\left(x^2+1\right)-6\,x^5+10\,x^3-30\,x+30\,\arctan(x)\right)\arctan(x)-\frac{1}{5}\,\arctan(x)^2-\frac{1}{300}\,(1$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*arctan(x)*log(x^2+1),x, algorithm="maxima")
```

```
[Out] 9/200*x^4 - 77/300*x^2 + 1/75*(15*x^5*log(x^2 + 1) - 6*x^5 + 10*x^3 - 30*x
+ 30*arctan(x))*arctan(x) - 1/5*arctan(x)^2 - 1/300*(15*x^4 - 30*x^2 - 137)
*log(x^2 + 1) - 1/20*log(x^2 + 1)^2
```

mupad [B] time = 0.48, size = 82, normalized size = 0.74

$$\frac{137\,\ln\left(x^2+1\right)}{300}-\frac{\ln\left(x^2+1\right)^2}{20}+\frac{\mathrm{atan}(x)^2}{5}-\mathrm{atan}(x)\left(\frac{2\,x}{5}-\frac{2\,x^3}{15}+\frac{2\,x^5}{25}-\frac{x^5\,\ln\left(x^2+1\right)}{5}\right)+\ln\left(x^2+1\right)\left(\frac{x^2}{10}-\frac{x^4}{20}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*log(x^2 + 1)*atan(x),x)
```

```
[Out] (137*log(x^2 + 1))/300 - log(x^2 + 1)^2/20 + atan(x)^2/5 - atan(x)*((2*x)/5
 - (2*x^3)/15 + (2*x^5)/25 - (x^5*log(x^2 + 1))/5) + log(x^2 + 1)*(x^2/10 -
 x^4/20) - (77*x^2)/300 + (9*x^4)/200
```

sympy [A] time = 4.64, size = 107, normalized size = 0.96

$$\frac{x^5\log\left(x^2+1\right)\operatorname{atan}(x)}{5}-\frac{2x^5\operatorname{atan}(x)}{25}-\frac{x^4\log\left(x^2+1\right)}{20}+\frac{9x^4}{200}+\frac{2x^3\operatorname{atan}(x)}{15}+\frac{x^2\log\left(x^2+1\right)}{10}-\frac{77x^2}{300}-\frac{2x\operatorname{atan}(x)}{5}-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*atan(x)*ln(x**2+1),x)
```

```
[Out] x**5*log(x**2 + 1)*atan(x)/5 - 2*x**5*atan(x)/25 - x**4*log(x**2 + 1)/20 +
9*x**4/200 + 2*x**3*atan(x)/15 + x**2*log(x**2 + 1)/10 - 77*x**2/300 - 2*x*
atan(x)/5 - log(x**2 + 1)**2/20 + 137*log(x**2 + 1)/300 + atan(x)**2/5
```

3.1276 $\int x^3 \tan^{-1}(x) \log\left(1+x^2\right) dx$

Optimal. Leaf size=88

$$-\frac{1}{8}x^4\tan^{-1}(x)+\frac{7x^3}{72}+\frac{1}{4}x\log\left(x^2+1\right)+\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{4}\log\left(x^2+1\right)\tan^{-1}(x)+\frac{1}{4}x^4\log\left(x^2+1\right)\tan^{-1}(x)-\frac{1}{12}x^3$$

```
[Out] -25/24*x+7/72*x^3+25/24*arctan(x)+1/4*x^2*arctan(x)-1/8*x^4*arctan(x)+1/4*x
*ln(x^2+1)-1/12*x^3*ln(x^2+1)-1/4*arctan(x)*ln(x^2+1)+1/4*x^4*arctan(x)*ln(
x^2+1)
```

Rubi [A] time = 0.12, antiderivative size = 88, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 12, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {4852, 302, 203, 2454, 2395, 43, 5019, 459, 321, 2471, 2448, 2455}

$$\frac{7x^3}{72}-\frac{1}{12}x^3\log\left(x^2+1\right)+\frac{1}{4}x\log\left(x^2+1\right)-\frac{1}{8}x^4\tan^{-1}(x)+\frac{1}{4}x^2\tan^{-1}(x)+\frac{1}{4}x^4\log\left(x^2+1\right)\tan^{-1}(x)-\frac{1}{4}\log\left(x^2+\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^3*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (-25*x)/24 + (7*x^3)/72 + (25*ArcTan[x])/24 + (x^2*ArcTan[x])/4 - (x^4*ArcT
an[x])/8 + (x*Log[1 + x^2])/4 - (x^3*Log[1 + x^2])/12 - (ArcTan[x]*Log[1 +
x^2])/4 + (x^4*ArcTan[x]*Log[1 + x^2])/4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
```

```
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + (g_.)*(x_
))^(q_.), x_Symbol] :> Simp[((f + g*x)^(q + 1)*(a + b*Log[c*(d + e*x)^n]))/
(g*(q + 1)), x] - Dist[(b*e*n)/(g*(q + 1)), Int[(f + g*x)^(q + 1)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, q}, x] && NeQ[e*f - d*g, 0] && N
eQ[q, -1]
```

Rule 2448

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)], x_Symbol] :> Simp[x*Log[c*(d
 + e*x^n)^p], x] - Dist[e*n*p, Int[x^n/(d + e*x^n), x], x] /; FreeQ[{c, d,
e, n, p}, x]
```

Rule 2454

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*Lo
g[c*(d + e*x)^p])^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, m, n, p, q},
x] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0] || IGtQ[q, 0]) &&
  !(EqQ[q, 1] && ILtQ[n, 0] && IGtQ[m, 0])
```

Rule 2455

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))*((f_.)*(x_))^
(m_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*Log[c*(d + e*x^n)^p]))/(f*(m
 + 1)), x] - Dist[(b*e*n*p)/(f*(m + 1)), Int[(x^(n - 1)*(f*x)^(m + 1))/(d +
 e*x^n), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && NeQ[m, -1]
```

Rule 2471

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*((f_) +
 (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> With[{t = ExpandIntegrand[(a + b*Log[
c*(d + e*x^n)^p])^q, (f + g*x^s)^r, x]}, Int[t, x] /; SumQ[t]] /; FreeQ[{a,
 b, c, d, e, f, g, n, p, q, r, s}, x] && IntegerQ[n] && IGtQ[q, 0] && Integ
erQ[r] && IntegerQ[s] && (EqQ[q, 1] || (GtQ[r, 0] && GtQ[s, 1]) || (LtQ[s,
0] && LtQ[r, 0]))
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 5019

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*Log[f + g*x^2])
, x]}, Dist[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[ExpandIntegrand[u/(1 +
 c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGtQ[(m + 1)/2
, 0]
```

Rubi steps

$$\int x^3\tan^{-1}(x)\log\left(1+x^2\right)\,dx = \frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)-\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{4}x^4\tan^{-1}(x)\log\left(1\right.$$
$$=\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)-\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{4}x^4\tan^{-1}(x)\log\left(1\right.$$
$$=\frac{x^3}{24}+\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)-\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{4}x^4\tan^{-1}(x)$$
$$=-\frac{3x}{8}+\frac{x^3}{24}+\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)-\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{4}x^4$$
$$=-\frac{3x}{8}+\frac{x^3}{24}+\frac{3}{8}\tan^{-1}(x)+\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)+\frac{1}{4}x\log\left(1+x^2\right)-$$
$$=-\frac{7x}{8}+\frac{x^3}{24}+\frac{3}{8}\tan^{-1}(x)+\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)+\frac{1}{4}x\log\left(1+x^2\right)-$$
$$=-\frac{25x}{24}+\frac{7x^3}{72}+\frac{7}{8}\tan^{-1}(x)+\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)+\frac{1}{4}x\log\left(1+x^2\right)-$$
$$=-\frac{25x}{24}+\frac{7x^3}{72}+\frac{25}{24}\tan^{-1}(x)+\frac{1}{4}x^2\tan^{-1}(x)-\frac{1}{8}x^4\tan^{-1}(x)+\frac{1}{4}x\log\left(1+x^2\right)$$

Mathematica [A] time = 0.03, size = 56, normalized size = 0.64

$$\frac{1}{72}\left(x\left(7x^2-6\left(x^2-3\right)\log\left(x^2+1\right)-75\right)+3\left(-3x^4+6x^2+6\left(x^4-1\right)\log\left(x^2+1\right)+25\right)\tan^{-1}(x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (x*(-75 + 7*x^2 - 6*(-3 + x^2)*Log[1 + x^2]) + 3*ArcTan[x]*(25 + 6*x^2 - 3*
x^4 + 6*(-1 + x^4)*Log[1 + x^2]))/72
```

fricas [A] time = 0.39, size = 49, normalized size = 0.56

$$\frac{7}{72}x^3-\frac{1}{24}\left(3x^4-6x^2-25\right)\arctan(x)-\frac{1}{12}\left(x^3-3\left(x^4-1\right)\arctan(x)-3x\right)\log\left(x^2+1\right)-\frac{25}{24}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(x)*log(x^2+1),x, algorithm="fricas")
```

```
[Out] 7/72*x^3 - 1/24*(3*x^4 - 6*x^2 - 25)*arctan(x) - 1/12*(x^3 - 3*(x^4 - 1)*ar
ctan(x) - 3*x)*log(x^2 + 1) - 25/24*x
```

giac [A] time = 5.98, size = 124, normalized size = 1.41

$$\frac{1}{8}\pi x^4\log\left(x^2+1\right)\operatorname{sgn}(x)-\frac{1}{4}x^4\arctan\left(\frac{1}{x}\right)\log\left(x^2+1\right)-\frac{1}{16}\pi x^4\operatorname{sgn}(x)+\frac{1}{8}x^4\arctan\left(\frac{1}{x}\right)-\frac{1}{12}x^3\log\left(x^2+1\right)+$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(x)*log(x^2+1),x, algorithm="giac")
```

```
[Out] 1/8*pi*x^4*log(x^2 + 1)*sgn(x) - 1/4*x^4*arctan(1/x)*log(x^2 + 1) - 1/16*pi
*x^4*sgn(x) + 1/8*x^4*arctan(1/x) - 1/12*x^3*log(x^2 + 1) + 1/8*pi*x^2*sgn(
x) + 7/72*x^3 - 1/4*x^2*arctan(1/x) - 1/8*pi*log(x^2 + 1)*sgn(x) + 1/4*x*lo
g(x^2 + 1) + 1/4*arctan(1/x)*log(x^2 + 1) - 25/24*pi*sgn(x) - 25/24*x + 25/
24*arctan(x)
```

maple [C] time = 3.22, size = 2849, normalized size = 32.38

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*arctan(x)*ln(x^2+1),x)
```

```
[Out] 1/6*(4+3*I*arctan(x)+I*x-3*x*arctan(x)-x^2-3*I*arctan(x)*x^2+3*x^3*arctan(x
))*(x+I)*ln((1+I*x)/(x^2+1)^(1/2))+1/4*x^2*arctan(x)-1/8*x^4*arctan(x)+1/2*
ln((1+I*x)^2/(x^2+1)+1)*arctan(x)-1/2*ln(2)*arctan(x)-1/2*ln((1+I*x)^2/(x^2
+1)+1)*x+1/6*ln((1+I*x)^2/(x^2+1)+1)*x^3-1/6*x^3*ln(2)+1/6*Pi*csgn(I*(1+I*x
)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3-1/6*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1)^
2)^3+1/6*Pi*csgn(I*(1+I*x)^2/(x^2+1))^3+1/24*I*csgn(I*(1+I*x)^2/(x^2+1)/((1
+I*x)^2/(x^2+1)+1)^2)^3*Pi*x^3+1/24*I*csgn(I*(1+I*x)^2/(x^2+1))^3*Pi*x^3-1/
24*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x^3+1/8*I*csgn(I*(1+I*x)^2/(x^2+1
)/((1+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi-1/8*I*csgn(I*(1+I*x)^2/(x^2+1)/((
1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x+1/8*I*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*P
i-1/8*I*csgn(I*(1+I*x)^2/(x^2+1))^3*Pi*x-1/8*I*csgn(I*((1+I*x)^2/(x^2+1)+1)
^2)^3*arctan(x)*Pi+1/8*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x+1/24*I*csgn
(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*x^3-1/24*I*csgn(I*
((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*Pi*x^3+1/12*I*csgn
(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x^3-1/8*I*cs
gn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1
)^2)^2*arctan(x)*Pi+1/8*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/
(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x-1/8*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+
I*x)^2/(x^2+1)+1)^2)^2*csgn(I*(1+I*x)^2/(x^2+1))*arctan(x)*Pi+1/8*I*csgn(I*
(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*(1+I*x)^2/(x^2+1))*Pi*x
-1/4*I*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*arctan(x)*
Pi+1/4*I*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*Pi*x+1/8
*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*arctan(x)*Pi-1
/8*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*x-1/8*I*c
sgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi
+1/8*I*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*Pi*x
+1/4*I*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*arct
an(x)*Pi-1/4*I*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2
)^2*Pi*x-1/8*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/((1
+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*arctan(x)*Pi*x^4+1/2*ln(2)*
x+1/6*Pi*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(
1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)+1/8*I*csgn(I*((1+I*x)^2/(x^2+1)+1
))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^4-1/4*I*csgn(I*((1+I*x)
^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi*x^4+1/24*I*cs
gn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1
)^2)*csgn(I*(1+I*x)^2/(x^2+1))*Pi*x^3+1/8*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)
*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)
)*arctan(x)*Pi-1/8*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+
1)/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*Pi*x+2/3*I*ln(2)-41/3
6*I-1/8*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi*
x^4-1/8*I*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*Pi*x^4+1/8*I*csgn(I*((1+I*x
)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi*x^4-1/24*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)
*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x^3-1/24*I*csgn(I*(
1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*(1+I*x)^2/(x^2+1))*Pi*x^
3-1/12*I*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*Pi*x^3-2
5/24*x+1/6*Pi*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*csgn(I*(1+I*x)^2/(x^2+1))-1/3
*Pi*csgn(I*(1+I*x)/(x^2+1)^(1/2))*csgn(I*(1+I*x)^2/(x^2+1))^2-1/6*Pi*csgn(I
*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)+1/3*Pi*csgn(I*((1
+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2-1/6*Pi*csgn(I/((1+I*x
)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2-1/6*P
i*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^
2)^2-1/2*ln((1+I*x)^2/(x^2+1)+1)*arctan(x)*x^4+1/2*ln(2)*arctan(x)*x^4+7/72
```

```
*x^3+41/24*arctan(x)+1/8*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2
/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi*x^4+1/8*I*csgn(I*(1+I*x)^2
/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*(1+I*x)^2/(x^2+1))*arctan(x)*Pi*
x^4+1/4*I*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*arctan(
x)*Pi*x^4-1/8*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*a
rctan(x)*Pi*x^4
```

maxima [A] time = 0.41, size = 62, normalized size = 0.70

$$\frac{7}{72}\,x^3+\frac{1}{8}\left(2\,x^4\log\left(x^2+1\right)-x^4+2\,x^2-2\,\log\left(x^2+1\right)\right)\arctan(x)-\frac{1}{12}\left(x^3-3\,x\right)\log\left(x^2+1\right)-\frac{25}{24}\,x+\frac{25}{24}\,\mathrm{arcta}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*arctan(x)*log(x^2+1),x, algorithm="maxima")
```

```
[Out] 7/72*x^3 + 1/8*(2*x^4*log(x^2 + 1) - x^4 + 2*x^2 - 2*log(x^2 + 1))*arctan(x
) - 1/12*(x^3 - 3*x)*log(x^2 + 1) - 25/24*x + 25/24*arctan(x)
```

mupad [B] time = 0.53, size = 69, normalized size = 0.78

$$\frac{25\,\mathrm{atan}(x)}{24}+\frac{x^2\,\mathrm{atan}(x)}{4}+x\left(\frac{\ln\left(x^2+1\right)}{4}-\frac{25}{24}\right)-x^3\left(\frac{\ln\left(x^2+1\right)}{12}-\frac{7}{72}\right)-x^4\left(\frac{\mathrm{atan}(x)}{8}-\frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{4}\right)-\frac{\mathrm{l}}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*log(x^2 + 1)*atan(x),x)
```

```
[Out] (25*atan(x))/24 + (x^2*atan(x))/4 + x*(log(x^2 + 1)/4 - 25/24) - x^3*(log(x
^2 + 1)/12 - 7/72) - x^4*(atan(x)/8 - (log(x^2 + 1)*atan(x))/4) - (log(x^2
+ 1)*atan(x))/4
```

sympy [A] time = 2.85, size = 83, normalized size = 0.94

$$\frac{x^4\log\left(x^2+1\right)\mathrm{atan}\left(x\right)}{4}-\frac{x^4\,\mathrm{atan}\left(x\right)}{8}-\frac{x^3\log\left(x^2+1\right)}{12}+\frac{7x^3}{72}+\frac{x^2\,\mathrm{atan}\left(x\right)}{4}+\frac{x\log\left(x^2+1\right)}{4}-\frac{25x}{24}-\frac{\log\left(x^2+1\right)\mathrm{at}}{4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*atan(x)*ln(x**2+1),x)
```

```
[Out] x**4*log(x**2 + 1)*atan(x)/4 - x**4*atan(x)/8 - x**3*log(x**2 + 1)/12 + 7*x
**3/72 + x**2*atan(x)/4 + x*log(x**2 + 1)/4 - 25*x/24 - log(x**2 + 1)*atan(
x)/4 + 25*atan(x)/24
```

3.1277 $\int x^2 \tan^{-1}(x) \log \left(1+x^2\right) dx$

Optimal. Leaf size=82

$$-\frac{2}{9}x^3\tan^{-1}(x)+\frac{5x^2}{18}+\frac{1}{12}\log^2\left(x^2+1\right)-\frac{1}{6}x^2\log\left(x^2+1\right)-\frac{11}{18}\log\left(x^2+1\right)+\frac{1}{3}x^3\log\left(x^2+1\right)\tan^{-1}(x)+\frac{2}{3}x\tan^{-1}(x$$

```
[Out] 5/18*x^2+2/3*x*arctan(x)-2/9*x^3*arctan(x)-1/3*arctan(x)^2-11/18*ln(x^2+1)-
1/6*x^2*ln(x^2+1)+1/3*x^3*arctan(x)*ln(x^2+1)+1/12*ln(x^2+1)^2
```

Rubi [A] time = 0.33, antiderivative size = 82, normalized size of antiderivative = 1.00, number of steps used = 19, number of rules used = 12, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {4852, 266, 43, 5021, 6725, 4916, 4846, 260, 4884, 2475, 2390, 2301}

$$\frac{5x^2}{18}+\frac{1}{12}\log^2\left(x^2+1\right)-\frac{1}{6}x^2\log\left(x^2+1\right)-\frac{11}{18}\log\left(x^2+1\right)-\frac{2}{9}x^3\tan^{-1}(x)+\frac{1}{3}x^3\log\left(x^2+1\right)\tan^{-1}(x)+\frac{2}{3}x\tan^{-1}(x)-$$

Antiderivative was successfully verified.

```
[In] Int[x^2*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (5*x^2)/18 + (2*x*ArcTan[x])/3 - (2*x^3*ArcTan[x])/9 - ArcTan[x]^2/3 - (11*
Log[1 + x^2])/18 - (x^2*Log[1 + x^2])/6 + (x^3*ArcTan[x]*Log[1 + x^2])/3 +
Log[1 + x^2]^2/12
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
```

```
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int x^2\tan^{-1}(x)\log\left(1+x^2\right)dx = -\frac{1}{6}x^2\log\left(1+x^2\right)+\frac{1}{3}x^3\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{6}\log^2\left(1+x^2\right)-2\int\left(\frac{x^3(-1\right.$$

$$= -\frac{1}{6}x^2\log\left(1+x^2\right)+\frac{1}{3}x^3\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{6}\log^2\left(1+x^2\right)-\frac{1}{3}\int\frac{x^3(-1+}{}$$

$$= -\frac{1}{6}x^2\log\left(1+x^2\right)+\frac{1}{3}x^3\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{6}\log^2\left(1+x^2\right)-\frac{1}{6}\text{Subst}\left(\int\right.$$

$$= -\frac{1}{6}x^2\log\left(1+x^2\right)+\frac{1}{3}x^3\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{6}\log^2\left(1+x^2\right)-\frac{1}{6}\text{Subst}\left(\int\right.$$

$$= -\frac{1}{6}x^2\log\left(1+x^2\right)+\frac{1}{3}x^3\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{12}\log^2\left(1+x^2\right)+\frac{1}{6}\text{Subst}\left(\int\right.$$

$$= -\frac{2}{9}x^3\tan^{-1}(x)-\frac{1}{6}x^2\log\left(1+x^2\right)+\frac{1}{3}x^3\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{12}\log^2\left(1+x^2\right.$$

$$= \frac{x^2}{6}+\frac{2}{3}x\tan^{-1}(x)-\frac{2}{9}x^3\tan^{-1}(x)-\frac{1}{3}\tan^{-1}(x)^2-\frac{1}{6}\log\left(1+x^2\right)-\frac{1}{6}x^2\log\left(1+\right.$$

$$= \frac{x^2}{6}+\frac{2}{3}x\tan^{-1}(x)-\frac{2}{9}x^3\tan^{-1}(x)-\frac{1}{3}\tan^{-1}(x)^2-\frac{1}{2}\log\left(1+x^2\right)-\frac{1}{6}x^2\log\left(1+\right.$$

$$= \frac{5x^2}{18}+\frac{2}{3}x\tan^{-1}(x)-\frac{2}{9}x^3\tan^{-1}(x)-\frac{1}{3}\tan^{-1}(x)^2-\frac{11}{18}\log\left(1+x^2\right)-\frac{1}{6}x^2\log\left(1\right.$$

Mathematica [A] time = 0.02, size = 64, normalized size = 0.78

$$\frac{1}{36}\left(10x^2+3\log^2\left(x^2+1\right)-2\left(3x^2+11\right)\log\left(x^2+1\right)+4x\left(-2x^2+3x^2\log\left(x^2+1\right)+6\right)\tan^{-1}(x)-12\tan^{-1}(x)^2\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (10*x^2 - 12*ArcTan[x]^2 - 2*(11 + 3*x^2)*Log[1 + x^2] + 3*Log[1 + x^2]^2 +
 4*x*ArcTan[x]*(6 - 2*x^2 + 3*x^2*Log[1 + x^2]))/36
```

fricas [A] time = 0.40, size = 55, normalized size = 0.67

$$\frac{5}{18}x^2-\frac{2}{9}\left(x^3-3x\right)\arctan(x)-\frac{1}{3}\arctan(x)^2+\frac{1}{18}\left(6x^3\arctan(x)-3x^2-11\right)\log\left(x^2+1\right)+\frac{1}{12}\log\left(x^2+1\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(x)*log(x^2+1),x, algorithm="fricas")
```

```
[Out] 5/18*x^2 - 2/9*(x^3 - 3*x)*arctan(x) - 1/3*arctan(x)^2 + 1/18*(6*x^3*arctan
(x) - 3*x^2 - 11)*log(x^2 + 1) + 1/12*log(x^2 + 1)^2
```

giac [B] time = 0.13, size = 135, normalized size = 1.65

$$\frac{1}{6}\pi x^3\log\left(x^2+1\right)\text{sgn}(x)-\frac{1}{3}x^3\arctan\left(\frac{1}{x}\right)\log\left(x^2+1\right)-\frac{1}{9}\pi x^3\text{sgn}(x)+\frac{2}{9}x^3\arctan\left(\frac{1}{x}\right)-\frac{1}{6}x^2\log\left(x^2+1\right)+\frac{1}{6}\pi^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(x)*log(x^2+1),x, algorithm="giac")
```

```
[Out] 1/6*pi*x^3*log(x^2 + 1)*sgn(x) - 1/3*x^3*arctan(1/x)*log(x^2 + 1) - 1/9*pi*
x^3*sgn(x) + 2/9*x^3*arctan(1/x) - 1/6*x^2*log(x^2 + 1) + 1/6*pi^2*sgn(x) +
 1/3*pi*x*sgn(x) + 1/3*pi*arctan(1/x)*sgn(x) - 1/6*pi^2 + 5/18*x^2 - 1/3*pi
```

```
*arctan(x) - 1/3*pi*arctan(1/x) - 2/3*x*arctan(1/x) - 1/3*arctan(1/x)^2 + 1
/12*log(x^2 + 1)^2 - 11/18*log(x^2 + 1)
```

maple [C] time = 2.69, size = 3039, normalized size = 37.06

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*arctan(x)*ln(x^2+1),x)
```

```
[Out] -1/6*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+
I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^3+2/3*x*arctan(x)-2/
9*x^3*arctan(x)-8/9*I*arctan(x)+5/18-1/3*x^2*ln(2)+1/3*ln((1+I*x)^2/(x^2+1)
+1)*x^2-2/3*ln((1+I*x)^2/(x^2+1)+1)*arctan(x)*x^3+2/3*ln(2)*arctan(x)*x^3-1
/12*I*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3+2/3*I*ln(2)*arctan(x)+1/12*I*Pi*
csgn(I*(1+I*x)^2/(x^2+1))^3+1/12*I*Pi*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(
x^2+1)+1)^2)^3+1/6*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*Pi+1/6*csgn(I*(1+I
*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi-1/6*csgn(I*((1+I*x)^2
/(x^2+1)+1)^2)^3*arctan(x)*Pi-1/3*(-2*I*arctan(x)-2*x^3*arctan(x)+2*ln((1+I
*x)^2/(x^2+1)+1)+1+x^2)*ln((1+I*x)/(x^2+1)^(1/2))-1/3*csgn(I*(1+I*x)^2/(x^2
+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*arctan(x)*Pi-1/6*csgn(I*(1+I*x)^2/(x^2
+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi+1/6*c
sgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*arctan(x)*Pi-1/6*c
sgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1
)+1)^2)*arctan(x)*Pi-1/6*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/
(x^2+1)+1)^2)*arctan(x)*Pi+1/3*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x
)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi-1/6*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/
(x^2+1)+1)^2)^3*arctan(x)*Pi*x^3+1/6*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*ar
ctan(x)*Pi*x^3-1/12*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2
+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x^2-1/6*I*csgn(I*(1+I*x)^2/(x^2+1))^2*csg
n(I*(1+I*x)/(x^2+1)^(1/2))*Pi*x^2-2/3*ln(2)*ln((1+I*x)^2/(x^2+1)+1)+1/6*csg
n(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*cs
gn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi+1/6*I*csgn(I*(1+I*x)^2/(x^2+1)/(
(1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I/((1+I*x)^2/(x^2+1)
+1)^2)*Pi*ln((1+I*x)^2/(x^2+1)+1)+1/6*I*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csg
n(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi*x^3+1/3*I*csg
n(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*arctan(x)*Pi*x^3+1/6
*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)
^2)^2*arctan(x)*Pi*x^3-1/6*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+
1)^(1/2))^2*arctan(x)*Pi*x^3+1/6*I*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*(
(1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^3-1/3*I*csgn(I*((1+I*x)^2/(x^2+1)+1)
)*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi*x^3+1/12*I*csgn(I/((1+I*x)
^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x
)^2/(x^2+1)+1)^2)*Pi*x^2+5/18*x^2-1/3*ln(2)+11/9*ln((1+I*x)^2/(x^2+1)+1)+1/
3*ln((1+I*x)^2/(x^2+1)+1)^2-1/6*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+
1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*Pi*ln((1+I*x)^2/(x^2+1)+1)-1/6*I
*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*Pi*x^3+1/12*I*Pi*csgn(I*(1+I*x)/(x^2
+1)^(1/2))^2*csgn(I*(1+I*x)^2/(x^2+1))-1/12*I*Pi*csgn(I*((1+I*x)^2/(x^2+1)+
1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)+1/6*I*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1)
)*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2+1/12*I*csgn(I*(1+I*x)^2/(x^2+1))^3*Pi*x
^2+1/12*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x^2-1/12*I
*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x^2-1/6*I*Pi*csgn(I*(1+I*x)/(x^2+1)^(
1/2))*csgn(I*(1+I*x)^2/(x^2+1))^2-1/12*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^
2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*Pi-1/12*I*Pi*csgn(I*(1+I*
x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2+1/6*I*csg
n(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*ln((1+I*x)^2/(x^2+1)+1)
+1/6*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*(1+I*x)^2/(x^2+1))^3-1/6*I*ln((1+I
*x)^2/(x^2+1)+1)*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3-1/12*I*csgn(I*(1+I*x)
^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x^2+1/12
*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*x^2-1/12*I*
```

```
csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*Pi*x^2+1/6*
I*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x^2+1/
12*I*Pi*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1
+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)+1/6*I*csgn(I*(1+I*x)^2/(x^2+1))*cs
gn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*ln((1+I*x)^2/(x^2+1)+1)-1/3*I*csgn(I*(1+I*
x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*Pi*ln((1+I*x)^2/(x^2+1)+1)-1/
6*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*(1+I*x)^2/(x
^2+1))*Pi*ln((1+I*x)^2/(x^2+1)+1)-1/6*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*csg
n(I*((1+I*x)^2/(x^2+1)+1))^2*Pi*ln((1+I*x)^2/(x^2+1)+1)+1/3*I*csgn(I*((1+I*
x)^2/(x^2+1)+1)^2)^2*csgn(I*((1+I*x)^2/(x^2+1)+1))*Pi*ln((1+I*x)^2/(x^2+1)+
1)
```

maxima [A] time = 0.42, size = 65, normalized size = 0.79

$$\frac{5}{18}x^2+\frac{1}{9}\left(3x^3\log\left(x^2+1\right)-2x^3+6x-6\arctan(x)\right)\arctan(x)+\frac{1}{3}\arctan(x)^2-\frac{1}{18}\left(3x^2+11\right)\log\left(x^2+1\right)+\frac{1}{12}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*arctan(x)*log(x^2+1),x, algorithm="maxima")
```

```
[Out] 5/18*x^2 + 1/9*(3*x^3*log(x^2 + 1) - 2*x^3 + 6*x - 6*arctan(x))*arctan(x) +
 1/3*arctan(x)^2 - 1/18*(3*x^2 + 11)*log(x^2 + 1) + 1/12*log(x^2 + 1)^2
```

mupad [B] time = 0.46, size = 65, normalized size = 0.79

$$\frac{\ln\left(x^2+1\right)^2}{12}-\frac{11\ln\left(x^2+1\right)}{18}-\frac{\operatorname{atan}(x)^2}{3}-x^2\left(\frac{\ln\left(x^2+1\right)}{6}-\frac{5}{18}\right)-x^3\left(\frac{2\operatorname{atan}(x)}{9}-\frac{\ln\left(x^2+1\right)\operatorname{atan}(x)}{3}\right)+\frac{2x\operatorname{atan}(x}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*log(x^2 + 1)*atan(x),x)
```

```
[Out] log(x^2 + 1)^2/12 - (11*log(x^2 + 1))/18 - atan(x)^2/3 - x^2*(log(x^2 + 1)/
6 - 5/18) - x^3*((2*atan(x))/9 - (log(x^2 + 1)*atan(x))/3) + (2*x*atan(x))/
3
```

sympy [A] time = 1.80, size = 78, normalized size = 0.95

$$\frac{x^3\log\left(x^2+1\right)\operatorname{atan}(x)}{3}-\frac{2x^3\operatorname{atan}(x)}{9}-\frac{x^2\log\left(x^2+1\right)}{6}+\frac{5x^2}{18}+\frac{2x\operatorname{atan}(x)}{3}+\frac{\log\left(x^2+1\right)^2}{12}-\frac{11\log\left(x^2+1\right)}{18}-\frac{\operatorname{atan}^2}{3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*atan(x)*ln(x**2+1),x)
```

```
[Out] x**3*log(x**2 + 1)*atan(x)/3 - 2*x**3*atan(x)/9 - x**2*log(x**2 + 1)/6 + 5*
x**2/18 + 2*x*atan(x)/3 + log(x**2 + 1)**2/12 - 11*log(x**2 + 1)/18 - atan(
x)**2/3
```

3.1278 $\int x\tan^{-1}(x)\log\left(1+x^2\right)\,dx$

Optimal. Leaf size=49

$$-\frac{1}{2}x\log\left(x^2+1\right)-\frac{1}{2}x^2\tan^{-1}(x)+\frac{1}{2}\left(x^2+1\right)\log\left(x^2+1\right)\tan^{-1}(x)+\frac{3x}{2}-\frac{3}{2}\tan^{-1}(x)$$

```
[Out] 3/2*x-3/2*arctan(x)-1/2*x^2*arctan(x)-1/2*x*ln(x^2+1)+1/2*(x^2+1)*arctan(x)
*ln(x^2+1)
```

Rubi [A] time = 0.05, antiderivative size = 49, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 8, integrand size = 10, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.800, Rules used = {4852, 321, 203, 2454, 2389, 2295, 5019, 2448}

$$-\frac{1}{2}x\log\left(x^2+1\right)-\frac{1}{2}x^2\tan^{-1}(x)+\frac{1}{2}\left(x^2+1\right)\log\left(x^2+1\right)\tan^{-1}(x)+\frac{3x}{2}-\frac{3}{2}\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[x*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (3*x)/2 - (3*ArcTan[x])/2 - (x^2*ArcTan[x])/2 - (x*Log[1 + x^2])/2 + ((1 +
x^2)*ArcTan[x]*Log[1 + x^2])/2
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2389

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.), x_Symbol] :
> Dist[1/e, Subst[Int[(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a
, b, c, d, e, n, p}, x]
```

Rule 2448

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)], x_Symbol] :> Simp[x*Log[c*(d
 + e*x^n)^p], x] - Dist[e*n*p, Int[x^n/(d + e*x^n), x], x] /; FreeQ[{c, d,
e, n, p}, x]
```

Rule 2454

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*Lo
g[c*(d + e*x)^p])^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, m, n, p, q},
x] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0] || IGtQ[q, 0]) &&
```

```
!(EqQ[q, 1] && ILtQ[n, 0] && IGtQ[m, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 5019

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*Log[f + g*x^2])
, x]}, Dist[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[ExpandIntegrand[u/(1 +
 c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGtQ[(m + 1)/2
, 0]
```

Rubi steps

$$
\begin{aligned}
\int x\tan^{-1}(x)\log\left(1+x^2\right)dx &= -\frac{1}{2}x^2\tan^{-1}(x)+\frac{1}{2}\left(1+x^2\right)\tan^{-1}(x)\log\left(1+x^2\right)-\int\left(-\frac{x^2}{2\left(1+x^2\right)}+\frac{1}{2}\log\left(1+\right.\right. \\
&= -\frac{1}{2}x^2\tan^{-1}(x)+\frac{1}{2}\left(1+x^2\right)\tan^{-1}(x)\log\left(1+x^2\right)+\frac{1}{2}\int\frac{x^2}{1+x^2}\,dx-\frac{1}{2}\int\log\left(1\right. \\
&= \frac{x}{2}-\frac{1}{2}x^2\tan^{-1}(x)-\frac{1}{2}x\log\left(1+x^2\right)+\frac{1}{2}\left(1+x^2\right)\tan^{-1}(x)\log\left(1+x^2\right)-\frac{1}{2}\int\frac{1}{1+} \\
&= \frac{3x}{2}-\frac{1}{2}\tan^{-1}(x)-\frac{1}{2}x^2\tan^{-1}(x)-\frac{1}{2}x\log\left(1+x^2\right)+\frac{1}{2}\left(1+x^2\right)\tan^{-1}(x)\log\left(1+\right. \\
&= \frac{3x}{2}-\frac{3}{2}\tan^{-1}(x)-\frac{1}{2}x^2\tan^{-1}(x)-\frac{1}{2}x\log\left(1+x^2\right)+\frac{1}{2}\left(1+x^2\right)\tan^{-1}(x)\log\left(1+\right.
\end{aligned}
$$

Mathematica [A] time = 0.02, size = 38, normalized size = 0.78

$$\frac{1}{2}\left(x^2\left(-\tan^{-1}(x)\right)+\log\left(x^2+1\right)\left(\left(x^2+1\right)\tan^{-1}(x)-x\right)+3x-3\tan^{-1}(x)\right)$$

Antiderivative was successfully verified.

```
[In] Integrate[x*ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] (3*x - 3*ArcTan[x] - x^2*ArcTan[x] + (-x + (1 + x^2)*ArcTan[x])*Log[1 + x^2
])/2
```

fricas [A] time = 0.39, size = 33, normalized size = 0.67

$$-\frac{1}{2}\left(x^2+3\right)\arctan(x)+\frac{1}{2}\left(\left(x^2+1\right)\arctan(x)-x\right)\log\left(x^2+1\right)+\frac{3}{2}x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(x)*log(x^2+1),x, algorithm="fricas")
```

```
[Out] -1/2*(x^2 + 3)*arctan(x) + 1/2*((x^2 + 1)*arctan(x) - x)*log(x^2 + 1) + 3/2
*x
```

giac [B] time = 0.13, size = 86, normalized size = 1.76

$$\frac{1}{4}\pi x^2\log\left(x^2+1\right)\mathrm{sgn}(x)-\frac{1}{2}x^2\arctan\left(\frac{1}{x}\right)\log\left(x^2+1\right)-\frac{1}{4}\pi x^2\mathrm{sgn}(x)+\frac{1}{2}x^2\arctan\left(\frac{1}{x}\right)+\frac{1}{4}\pi\log\left(x^2+1\right)\mathrm{sgn}(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(x)*log(x^2+1),x, algorithm="giac")
```

```
[Out] 1/4*pi*x^2*log(x^2 + 1)*sgn(x) - 1/2*x^2*arctan(1/x)*log(x^2 + 1) - 1/4*pi*
x^2*sgn(x) + 1/2*x^2*arctan(1/x) + 1/4*pi*log(x^2 + 1)*sgn(x) - 1/2*x*log(x
^2 + 1) - 1/2*arctan(1/x)*log(x^2 + 1) + 3/2*x - 3/2*arctan(x)
```

maple [C] time = 1.57, size = 2240, normalized size = 45.71

Expression too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*arctan(x)*ln(x^2+1),x)
```

```
[Out] -1/2*x^2*arctan(x)-ln((1+I*x)^2/(x^2+1)+1)*arctan(x)+ln(2)*arctan(x)+ln((1+
I*x)^2/(x^2+1)+1)*x-1/4*Pi*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2
)^3+1/4*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3-1/4*Pi*csgn(I*(1+I*x)^2/(x^2+1
))^3+(-1-I*arctan(x)+x*arctan(x))*(x+I)*ln((1+I*x)/(x^2+1)^(1/2))+ln(2)*arc
tan(x)*x^2-ln((1+I*x)^2/(x^2+1)+1)*arctan(x)*x^2-1/4*I*csgn(I*(1+I*x)^2/(x^
2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I/((1+I*x)^2/(
x^2+1)+1)^2)*arctan(x)*Pi+1/4*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/
(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*Pi*x+1/2*I
*csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*arctan(x)*Pi*x^2
+1/4*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1
)+1)^2)^2*arctan(x)*Pi*x^2-1/4*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(
x^2+1)^(1/2))^2*arctan(x)*Pi*x^2+1/4*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/
(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^2-1/2*I*csgn
(I*((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*((1+I*x)^2/(x^2+1)+1))*arctan(x)*Pi*x^
2+1/4*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*arc
tan(x)*Pi*x^2-1/4*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+
I*x)^2/(x^2+1)+1)^2)*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x^2-ln(2)
*x-1/4*Pi*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*
(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)+3/2*x-1/4*Pi*csgn(I*(1+I*x)/(x^2
+1)^(1/2))^2*csgn(I*(1+I*x)^2/(x^2+1))+1/2*Pi*csgn(I*(1+I*x)/(x^2+1)^(1/2))
*csgn(I*(1+I*x)^2/(x^2+1))^2+1/4*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*
((1+I*x)^2/(x^2+1)+1)^2)-1/2*Pi*csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*
x)^2/(x^2+1)+1)^2)^2+1/4*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2
)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi-1/4*I*csgn(I*(1+I*x)^2/(x^
2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*Pi*x-1/2*I*
csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*((1+I*x)^2/(x^2+1)+1))*arctan(x)*P
i+1/2*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*((1+I*x)^2/(x^2+1)+1))*Pi*
x+1/4*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*arc
tan(x)*Pi-1/4*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*((1+I*x)^2/(x^2+1)+1
))^2*Pi*x+3/2*I-I*ln(2)-1/4*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1
)^2)^3*arctan(x)*Pi+1/4*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)
^3*Pi*x+1/4*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi-1/4*I*csgn(I*(
(1+I*x)^2/(x^2+1)+1)^2)^3*Pi*x-1/4*I*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*
Pi+1/4*I*csgn(I*(1+I*x)^2/(x^2+1))^3*Pi*x+1/4*Pi*csgn(I/((1+I*x)^2/(x^2+1)+
1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2+1/4*Pi*csgn(I*(1+
I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2-5/2*arc
tan(x)-1/4*I*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*Pi*x^2-1/4*I*csgn(I*(1+I
*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi*x^2+1/4*I*csgn(I*((1+
I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi*x^2+1/2*I*csgn(I*(1+I*x)^2/(x^2+1))^2*c
sgn(I*(1+I*x)/(x^2+1)^(1/2))*arctan(x)*Pi-1/2*I*csgn(I*(1+I*x)^2/(x^2+1))^2
*csgn(I*(1+I*x)/(x^2+1)^(1/2))*Pi*x+1/4*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*
(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi-1/4*I*csgn(I*(1+I
*x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*Pi*x-1/4
*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*arctan(x)*Pi+1
/4*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*x
```

maxima [A] time = 0.52, size = 39, normalized size = 0.80

$$-\frac{1}{2}\left(x^2-\left(x^2+1\right)\log\left(x^2+1\right)+1\right)\arctan(x)-\frac{1}{2}x\log\left(x^2+1\right)+\frac{3}{2}x-\arctan(x)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*arctan(x)*log(x^2+1),x, algorithm="maxima")
```

```
[Out] -1/2*(x^2 - (x^2 + 1)*log(x^2 + 1) + 1)*arctan(x) - 1/2*x*log(x^2 + 1) + 3/
2*x - arctan(x)
```

mupad [B] time = 0.47, size = 48, normalized size = 0.98

$$\frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{2}-x\left(\frac{\ln\left(x^2+1\right)}{2}-\frac{3}{2}\right)-x^2\left(\frac{\mathrm{atan}(x)}{2}-\frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{2}\right)-\frac{3\,\mathrm{atan}(x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*log(x^2 + 1)*atan(x),x)
```

```
[Out] (log(x^2 + 1)*atan(x))/2 - x*(log(x^2 + 1)/2 - 3/2) - x^2*(atan(x)/2 - (log
(x^2 + 1)*atan(x))/2) - (3*atan(x))/2
```

sympy [A] time = 1.06, size = 56, normalized size = 1.14

$$\frac{x^2\log\left(x^2+1\right)\operatorname{atan}(x)}{2}-\frac{x^2\operatorname{atan}(x)}{2}-\frac{x\log\left(x^2+1\right)}{2}+\frac{3x}{2}+\frac{\log\left(x^2+1\right)\operatorname{atan}(x)}{2}-\frac{3\operatorname{atan}(x)}{2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*atan(x)*ln(x**2+1),x)
```

```
[Out] x**2*log(x**2 + 1)*atan(x)/2 - x**2*atan(x)/2 - x*log(x**2 + 1)/2 + 3*x/2 +
 log(x**2 + 1)*atan(x)/2 - 3*atan(x)/2
```

3.1279 $\int \tan^{-1}(x) \log \left(1 + x^2\right) dx$

Optimal. Leaf size=38

$$-\frac{1}{4}\log^2\left(x^2+1\right)+\log\left(x^2+1\right)+x\log\left(x^2+1\right)\tan^{-1}(x)+\tan^{-1}(x)^2-2x\tan^{-1}(x)$$

```
[Out] -2*x*arctan(x)+arctan(x)^2+ln(x^2+1)+x*arctan(x)*ln(x^2+1)-1/4*ln(x^2+1)^2
```

Rubi [**A**] time = 0.11, antiderivative size = 38, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 8, integrand size = 9, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.889, Rules used = {4846, 260, 5009, 2475, 2390, 2301, 4916, 4884}

$$-\frac{1}{4}\log^2\left(x^2+1\right)+\log\left(x^2+1\right)+x\log\left(x^2+1\right)\tan^{-1}(x)+\tan^{-1}(x)^2-2x\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] -2*x*ArcTan[x] + ArcTan[x]^2 + Log[1 + x^2] + x*ArcTan[x]*Log[1 + x^2] - Lo
g[1 + x^2]^2/4
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 5009

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.)), x_Symbol] :> Simp[x*(d + e*Log[f + g*x^2])*(a + b*ArcTan[c*x]), x] +
 (-Dist[b*c, Int[(x*(d + e*Log[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[2*
e*g, Int[(x^2*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c,
d, e, f, g}, x]
```

Rubi steps

$$\int \tan^{-1}(x)\log\left(1+x^2\right)dx = x\tan^{-1}(x)\log\left(1+x^2\right)-2\int\frac{x^2\tan^{-1}(x)}{1+x^2}dx-\int\frac{x\log\left(1+x^2\right)}{1+x^2}dx$$
$$= x\tan^{-1}(x)\log\left(1+x^2\right)-\frac{1}{2}\text{Subst}\left(\int\frac{\log(1+x)}{1+x}dx,x,x^2\right)-2\int\tan^{-1}(x)\,dx+2\int$$
$$= -2x\tan^{-1}(x)+\tan^{-1}(x)^2+x\tan^{-1}(x)\log\left(1+x^2\right)-\frac{1}{2}\text{Subst}\left(\int\frac{\log(x)}{x}dx,x,1+\right.$$
$$= -2x\tan^{-1}(x)+\tan^{-1}(x)^2+\log\left(1+x^2\right)+x\tan^{-1}(x)\log\left(1+x^2\right)-\frac{1}{4}\log^2\left(1+x^2\right.$$

Mathematica [A] time = 0.01, size = 38, normalized size = 1.00

$$-\frac{1}{4}\log^2\left(x^2+1\right)+\log\left(x^2+1\right)+x\log\left(x^2+1\right)\tan^{-1}(x)+\tan^{-1}(x)^2-2x\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[ArcTan[x]*Log[1 + x^2],x]
```

```
[Out] -2*x*ArcTan[x] + ArcTan[x]^2 + Log[1 + x^2] + x*ArcTan[x]*Log[1 + x^2] - Lo
g[1 + x^2]^2/4
```

fricas [A] time = 0.39, size = 33, normalized size = 0.87

$$-2\,x\arctan(x)+\arctan(x)^2+(x\arctan(x)+1)\log\left(x^2+1\right)-\frac{1}{4}\,\log\left(x^2+1\right)^2$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1),x, algorithm="fricas")
```

```
[Out] -2*x*arctan(x) + arctan(x)^2 + (x*arctan(x) + 1)*log(x^2 + 1) - 1/4*log(x^2
 + 1)^2
```

giac [B] time = 0.12, size = 92, normalized size = 2.42

$$\frac{1}{2}\pi x\log\left(x^2+1\right)\text{sgn}(x)-x\arctan\left(\frac{1}{x}\right)\log\left(x^2+1\right)-\frac{3}{2}\pi^2\text{sgn}(x)-\pi x\text{sgn}(x)-\pi\arctan\left(\frac{1}{x}\right)\text{sgn}(x)+\frac{1}{2}\pi^2+\pi\,\text{arcta}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1),x, algorithm="giac")
```

```
[Out] 1/2*pi*x*log(x^2 + 1)*sgn(x) - x*arctan(1/x)*log(x^2 + 1) - 3/2*pi^2*sgn(x)
 - pi*x*sgn(x) - pi*arctan(1/x)*sgn(x) + 1/2*pi^2 + pi*arctan(x) + pi*arcta
n(1/x) + 2*x*arctan(1/x) + arctan(1/x)^2 - 1/4*log(x^2 + 1)^2 + log(x^2 + 1
)
```

maple [C] time = 1.36, size = 1913, normalized size = 50.34

result too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(x)*ln(x^2+1),x)
```

```
[Out] -2*x*arctan(x)+1/2*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*ln((1+I*x)^2/(x^2
+1)+1)-1/2*I*csgn(I*(1+I*x)^2/(x^2+1))^3*Pi*ln((1+I*x)^2/(x^2+1)+1)-1/2*I*c
sgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*Pi*ln((1+I*x)^2/(x^2+1)+
1)+2*(-I*arctan(x)+x*arctan(x)+ln((1+I*x)^2/(x^2+1)+1))*ln((1+I*x)/(x^2+1)^
(1/2))+2*I*arctan(x)-1/2*csgn(I*(1+I*x)^2/(x^2+1))^3*arctan(x)*Pi-1/2*csgn(
I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi+1/2*csgn(I*((1+
I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi+csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I
*x)/(x^2+1)^(1/2))*arctan(x)*Pi+1/2*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x
)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi-1/2*csgn(I*(1+I*x)^2/(x
^2+1))*csgn(I*(1+I*x)/(x^2+1)^(1/2))^2*arctan(x)*Pi+1/2*csgn(I*(1+I*x)^2/(x
^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*
Pi+1/2*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*arct
an(x)*Pi-csgn(I*((1+I*x)^2/(x^2+1)+1))*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*ar
ctan(x)*Pi+2*ln(2)*ln((1+I*x)^2/(x^2+1)+1)-1/2*csgn(I*(1+I*x)^2/(x^2+1))*cs
gn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I/((1+I*x)^2/(x^2+1)+1
)^2)*arctan(x)*Pi-2*ln((1+I*x)^2/(x^2+1)+1)-ln((1+I*x)^2/(x^2+1)+1)^2-1/2*I
*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)^2
/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)*arctan(x)*Pi*x+1/2*I*csgn(I*(1+I*x)^2/(x^
2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*arctan(x)*Pi*x+I*
csgn(I*(1+I*x)^2/(x^2+1))^2*csgn(I*(1+I*x)/(x^2+1)^(1/2))*arctan(x)*Pi*x-1/
2*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*
x)^2/(x^2+1))*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)+1/2*I*csgn(
I/((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2
)^2*arctan(x)*Pi*x-1/2*I*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x)/(x^2+1)^(
1/2))^2*arctan(x)*Pi*x-I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I*((1+I*x)^
2/(x^2+1)+1))*arctan(x)*Pi*x+1/2*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)*csgn(I*(
(1+I*x)^2/(x^2+1)+1))^2*arctan(x)*Pi*x+I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*
(1+I*x)/(x^2+1)^(1/2))*csgn(I*(1+I*x)^2/(x^2+1))^2-1/2*I*csgn(I*(1+I*x)^2/(
x^2+1))^3*arctan(x)*Pi*x-1/2*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+
1)^2)^3*arctan(x)*Pi*x+1/2*I*csgn(I*((1+I*x)^2/(x^2+1)+1)^2)^3*arctan(x)*Pi
*x+1/2*I*ln((1+I*x)^2/(x^2+1)+1)*Pi*csgn(I*(1+I*x)^2/(x^2+1))*csgn(I*(1+I*x
)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2-2*arctan(x)*ln((1+I*x)^2/(x^2+1)+1)*
x+2*arctan(x)*ln(2)*x-2*I*ln(2)*arctan(x)-1/2*I*csgn(I*(1+I*x)^2/(x^2+1))*c
sgn(I*(1+I*x)/(x^2+1)^(1/2))^2*Pi*ln((1+I*x)^2/(x^2+1)+1)-I*csgn(I*((1+I*x)
^2/(x^2+1)+1)^2)^2*csgn(I*((1+I*x)^2/(x^2+1)+1))*Pi*ln((1+I*x)^2/(x^2+1)+1)
+1/2*I*csgn(I*(1+I*x)^2/(x^2+1)/((1+I*x)^2/(x^2+1)+1)^2)^2*csgn(I/((1+I*x)^
2/(x^2+1)+1)^2)*Pi*ln((1+I*x)^2/(x^2+1)+1)+1/2*I*csgn(I*((1+I*x)^2/(x^2+1)+
1)^2)*csgn(I*((1+I*x)^2/(x^2+1)+1))^2*Pi*ln((1+I*x)^2/(x^2+1)+1)
```

maxima [A] time = 0.41, size = 42, normalized size = 1.11

$$\left(x\log\left(x^2+1\right)-2\,x+2\,\arctan(x)\right)\arctan(x)-\arctan(x)^2-\frac{1}{4}\,\log\left(x^2+1\right)^2+\log\left(x^2+1\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1),x, algorithm="maxima")
```

```
[Out] (x*log(x^2 + 1) - 2*x + 2*arctan(x))*arctan(x) - arctan(x)^2 - 1/4*log(x^2
+ 1)^2 + log(x^2 + 1)
```

mupad [B] time = 0.46, size = 39, normalized size = 1.03

$$\ln\left(x^2+1\right)-\frac{\ln\left(x^2+1\right)^2}{4}+\mathrm{atan}(x)^2-x\,\left(2\,\mathrm{atan}(x)-\ln\left(x^2+1\right)\,\mathrm{atan}(x)\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(log(x^2 + 1)*atan(x),x)
```

```
[Out] log(x^2 + 1) - log(x^2 + 1)^2/4 + atan(x)^2 - x*(2*atan(x) - log(x^2 + 1)*a
tan(x))
```

sympy [A] time = 0.59, size = 39, normalized size = 1.03

$$x\log\left(x^2+1\right)\mathrm{atan}\left(x\right)-2x\,\mathrm{atan}\left(x\right)-\frac{\log\left(x^2+1\right)^2}{4}+\log\left(x^2+1\right)+\mathrm{atan}^2\left(x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(x)*ln(x**2+1),x)
```

```
[Out] x*log(x**2 + 1)*atan(x) - 2*x*atan(x) - log(x**2 + 1)**2/4 + log(x**2 + 1)
+ atan(x)**2
```

3.1280 $\int \frac{\tan^{-1}(x)\log(1+x^2)}{x}\,dx$

Optimal. Leaf size=189

$$-\frac{1}{2}i\text{Li}_2(-ix)\left(-\log\left(x^2+1\right)+\log(1-ix)+\log(1+ix)\right)+\frac{1}{2}i\text{Li}_2(ix)\left(-\log\left(x^2+1\right)+\log(1-ix)+\log(1+ix)\right)$$

```
[Out] -1/2*I*ln(1+I*x)^2*ln(-I*x)+1/2*I*ln(1-I*x)^2*ln(I*x)+I*ln(1-I*x)*polylog(2
,1-I*x)-I*ln(1+I*x)*polylog(2,1+I*x)-1/2*I*(ln(1-I*x)+ln(1+I*x)-ln(x^2+1))*
polylog(2,-I*x)+1/2*I*(ln(1-I*x)+ln(1+I*x)-ln(x^2+1))*polylog(2,I*x)-I*poly
log(3,1-I*x)+I*polylog(3,1+I*x)
```

Rubi [A] time = 0.18, antiderivative size = 189, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 7, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {4848, 2391, 5011, 2396, 2433, 2374, 6589}

$$-\frac{1}{2}i\left(-\log\left(x^2+1\right)+\log(1-ix)+\log(1+ix)\right)\text{PolyLog}(2,-ix)+\frac{1}{2}i\left(-\log\left(x^2+1\right)+\log(1-ix)+\log(1+ix)\right)$$

Antiderivative was successfully verified.

```
[In] Int[(ArcTan[x]*Log[1 + x^2])/x,x]
```

```
[Out] (-I/2)*Log[1 + I*x]^2*Log[(-I)*x] + (I/2)*Log[1 - I*x]^2*Log[I*x] + I*Log[1
 - I*x]*PolyLog[2, 1 - I*x] - I*Log[1 + I*x]*PolyLog[2, 1 + I*x] - (I/2)*(L
og[1 - I*x] + Log[1 + I*x] - Log[1 + x^2])*PolyLog[2, (-I)*x] + (I/2)*(Log[
1 - I*x] + Log[1 + I*x] - Log[1 + x^2])*PolyLog[2, I*x] - I*PolyLog[3, 1 -
I*x] + I*PolyLog[3, 1 + I*x]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 5011

```
Int[(ArcTan[(c_.)*(x_)]*Log[(f_.) + (g_.)*(x_)^2])/(x_), x_Symbol] :> Dist[
Log[f + g*x^2] - Log[1 - I*c*x] - Log[1 + I*c*x], Int[ArcTan[c*x]/x, x], x]
 + (Dist[I/2, Int[Log[1 - I*c*x]^2/x, x], x] - Dist[I/2, Int[Log[1 + I*c*x]
^2/x, x], x]) /; FreeQ[{c, f, g}, x] && EqQ[g, c^2*f]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x}\,dx = \frac{1}{2}i\int \frac{\log^2(1-ix)}{x}\,dx - \frac{1}{2}i\int \frac{\log^2(1+ix)}{x}\,dx + \left(-\log(1-ix) - \log(1+ix) + \log\left(\right.\right.$$
$$= -\frac{1}{2}i\log^2(1+ix)\log(-ix) + \frac{1}{2}i\log^2(1-ix)\log(ix) + \frac{1}{2}\left(i\left(\log(1-ix) + \log(1+ix\right.\right.$$
$$= -\frac{1}{2}i\log^2(1+ix)\log(-ix) + \frac{1}{2}i\log^2(1-ix)\log(ix) - \frac{1}{2}i\left(\log(1-ix) + \log(1+ix) - \right.$$
$$= -\frac{1}{2}i\log^2(1+ix)\log(-ix) + \frac{1}{2}i\log^2(1-ix)\log(ix) + i\log(1-ix)\text{Li}_2(1-ix) - i\log$$
$$= -\frac{1}{2}i\log^2(1+ix)\log(-ix) + \frac{1}{2}i\log^2(1-ix)\log(ix) + i\log(1-ix)\text{Li}_2(1-ix) - i\log$$

Mathematica [F] time = 0.78, size = 0, normalized size = 0.00

$$\int \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[(ArcTan[x]*Log[1 + x^2])/x,x]
[Out] Integrate[(ArcTan[x]*Log[1 + x^2])/x, x]
```

fricas [F] time = 0.40, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(x)\log\left(x^2+1\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x,x, algorithm="fricas")
[Out] integral(arctan(x)*log(x^2 + 1)/x, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\log\left(x^2+1\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x,x, algorithm="giac")
```

```
[Out] integrate(arctan(x)*log(x^2 + 1)/x, x)
```

maple [C] time = 2.80, size = 5237, normalized size = 27.71

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(x)*ln(x^2+1)/x,x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\log\left(x^2+1\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x,x, algorithm="maxima")
```

```
[Out] integrate(arctan(x)*log(x^2 + 1)/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((log(x^2 + 1)*atan(x))/x,x)
```

```
[Out] int((log(x^2 + 1)*atan(x))/x, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(x^2+1\right)\mathrm{atan}\,(x)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(x)*ln(x**2+1)/x,x)
```

```
[Out] Integral(log(x**2 + 1)*atan(x)/x, x)
```

3.1281 $\int \frac{\tan^{-1}(x)\log(1+x^2)}{x^2}\,dx$

Optimal. Leaf size=41

$$-\frac{\text{Li}_2\left(-x^2\right)}{2}-\frac{1}{4}\log^2\left(x^2+1\right)-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{x}+\tan^{-1}(x)^2$$

```
[Out] arctan(x)^2-arctan(x)*ln(x^2+1)/x-1/4*ln(x^2+1)^2-1/2*polylog(2,-x^2)
```

Rubi [A] time = 0.13, antiderivative size = 41, normalized size of antiderivative = 1.00, number of steps used = 8, number of rules used = 12, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.000, Rules used = {4852, 266, 36, 29, 31, 5017, 2475, 2410, 2390, 2301, 2391, 4884}

$$-\frac{1}{2}\text{PolyLog}\left(2,-x^2\right)-\frac{1}{4}\log^2\left(x^2+1\right)-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{x}+\tan^{-1}(x)^2$$

Antiderivative was successfully verified.

```
[In] Int[(ArcTan[x]*Log[1 + x^2])/x^2,x]
```

```
[Out] ArcTan[x]^2 - (ArcTan[x]*Log[1 + x^2])/x - Log[1 + x^2]^2/4 - PolyLog[2, -x
^2]/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2410

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))]*(x_)^(m_.))/((f_) + (g_.)*(x_)), x_Symb
ol] :> Int[ExpandIntegrand[Log[c*(d + e*x)], x^m/(f + g*x), x], x] /; FreeQ
[{c, d, e, f, g}, x] && EqQ[e*f - d*g, 0] && EqQ[c*d, 1] && IntegerQ[m]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 5017

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> Simp[(x^(m + 1)*(d + e*Log[f + g*x^2])*(a +
b*ArcTan[c*x]))/(m + 1), x] + (-Dist[(b*c)/(m + 1), Int[(x^(m + 1)*(d + e*L
og[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[(2*e*g)/(m + 1), Int[(x^(m + 2
)*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c, d, e, f, g},
 x] && ILtQ[m/2, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x^2}\,dx = -\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x} + 2\int \frac{\tan^{-1}(x)}{1+x^2}\,dx + \int \frac{\log\left(1+x^2\right)}{x\left(1+x^2\right)}\,dx$$
$$= \tan^{-1}(x)^2 - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x} + \frac{1}{2}\text{Subst}\left(\int \frac{\log(1+x)}{x(1+x)}\,dx, x, x^2\right)$$
$$= \tan^{-1}(x)^2 - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x} + \frac{1}{2}\text{Subst}\left(\int \left(\frac{\log(1+x)}{-1-x} + \frac{\log(1+x)}{x}\right)dx, x, x^2\right)$$
$$= \tan^{-1}(x)^2 - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x} + \frac{1}{2}\text{Subst}\left(\int \frac{\log(1+x)}{-1-x}\,dx, x, x^2\right) + \frac{1}{2}\text{Subst}\left(\int \frac{\log(1+x)}{x}\,dx, x, x^2\right)$$
$$= \tan^{-1}(x)^2 - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x} - \frac{\text{Li}_2\left(-x^2\right)}{2} - \frac{1}{2}\text{Subst}\left(\int \frac{\log(x)}{x}\,dx, x, 1+x^2\right)$$
$$= \tan^{-1}(x)^2 - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x} - \frac{1}{4}\log^2\left(1+x^2\right) - \frac{\text{Li}_2\left(-x^2\right)}{2}$$

Mathematica [A] time = 0.01, size = 41, normalized size = 1.00

$$-\frac{\text{Li}_2\left(-x^2\right)}{2} - \frac{1}{4}\log^2\left(x^2+1\right) - \frac{\log\left(x^2+1\right)\tan^{-1}(x)}{x} + \tan^{-1}(x)^2$$

Antiderivative was successfully verified.

```
[In] Integrate[(ArcTan[x]*Log[1 + x^2])/x^2,x]
[Out] ArcTan[x]^2 - (ArcTan[x]*Log[1 + x^2])/x - Log[1 + x^2]^2/4 - PolyLog[2, -x
^2]/2
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(x)\log\left(x^2+1\right)}{x^2}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^2,x, algorithm="fricas")
[Out] integral(arctan(x)*log(x^2 + 1)/x^2, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\log\left(x^2+1\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^2,x, algorithm="giac")
[Out] integrate(arctan(x)*log(x^2 + 1)/x^2, x)
```

maple [F] time = 4.42, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\ln\left(x^2+1\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(x)*ln(x^2+1)/x^2,x)
[Out] int(arctan(x)*ln(x^2+1)/x^2,x)
```

maxima [A] time = 0.42, size = 58, normalized size = 1.41

$$-\left(\frac{\log\left(x^2+1\right)}{x}-2\arctan(x)\right)\arctan(x)-\arctan(x)^2+\frac{1}{2}\log\left(-x^2\right)\log\left(x^2+1\right)-\frac{1}{4}\log\left(x^2+1\right)^2+\frac{1}{2}\operatorname{Li}_2\left(x^2+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^2,x, algorithm="maxima")
[Out] -(log(x^2 + 1)/x - 2*arctan(x))*arctan(x) - arctan(x)^2 + 1/2*log(-x^2)*log
(x^2 + 1) - 1/4*log(x^2 + 1)^2 + 1/2*dilog(x^2 + 1)
```

mupad [B] time = 0.11, size = 36, normalized size = 0.88

$$\operatorname{atan}(x)^2-\frac{\ln\left(x^2+1\right)^2}{4}-\frac{\operatorname{Li}_2\left(x^2+1\right)}{2}-\frac{\ln\left(x^2+1\right)\operatorname{atan}(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((log(x^2 + 1)*atan(x))/x^2,x)
[Out] atan(x)^2 - log(x^2 + 1)^2/4 - dilog(x^2 + 1)/2 - (log(x^2 + 1)*atan(x))/x
```

sympy [C] time = 83.96, size = 37, normalized size = 0.90

$$-\frac{\log\left(x^2+1\right)^2}{4}+\operatorname{atan}^2(x)-\frac{\operatorname{Li}_2\left(x^2e^{i\pi}\right)}{2}-\frac{\log\left(x^2+1\right)\operatorname{atan}(x)}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(x)*ln(x**2+1)/x**2,x)
[Out] -log(x**2 + 1)**2/4 + atan(x)**2 - polylog(2, x**2*exp_polar(I*pi))/2 - log
(x**2 + 1)*atan(x)/x
```

3.1282 $\int \frac{\tan^{-1}(x)\log(1+x^2)}{x^3}\,dx$

Optimal. Leaf size=69

$$\frac{1}{2}i\text{Li}_2(-ix)-\frac{1}{2}i\text{Li}_2(ix)-\frac{\log\left(x^2+1\right)}{2x}-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{2x^2}-\frac{1}{2}\log\left(x^2+1\right)\tan^{-1}(x)+\tan^{-1}(x)$$

```
[Out] arctan(x)-1/2*ln(x^2+1)/x-1/2*arctan(x)*ln(x^2+1)-1/2*arctan(x)*ln(x^2+1)/x
^2+1/2*I*polylog(2,-I*x)-1/2*I*polylog(2,I*x)
```

Rubi [A] time = 0.08, antiderivative size = 69, normalized size of antiderivative = 1.00, number of steps used = 6, number of rules used = 6, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.500, Rules used = {4852, 325, 203, 5021, 4848, 2391}

$$\frac{1}{2}i\text{PolyLog}(2,-ix)-\frac{1}{2}i\text{PolyLog}(2,ix)-\frac{\log\left(x^2+1\right)}{2x}-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{2x^2}-\frac{1}{2}\log\left(x^2+1\right)\tan^{-1}(x)+\tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Int[(ArcTan[x]*Log[1 + x^2])/x^3,x]
```

```
[Out] ArcTan[x] - Log[1 + x^2]/(2*x) - (ArcTan[x]*Log[1 + x^2])/2 - (ArcTan[x]*Lo
g[1 + x^2])/(2*x^2) + (I/2)*PolyLog[2, (-I)*x] - (I/2)*PolyLog[2, I*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x^3}\,dx = -\frac{\log\left(1+x^2\right)}{2x} - \frac{1}{2}\tan^{-1}(x)\log\left(1+x^2\right) - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{2x^2} - 2\int\left(-\frac{1}{2\left(1+\right.}\right.$$
$$= -\frac{\log\left(1+x^2\right)}{2x} - \frac{1}{2}\tan^{-1}(x)\log\left(1+x^2\right) - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{2x^2} + \int\frac{1}{1+x^2}\,dx$$
$$= \tan^{-1}(x) - \frac{\log\left(1+x^2\right)}{2x} - \frac{1}{2}\tan^{-1}(x)\log\left(1+x^2\right) - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{2x^2} + \frac{1}{2}i$$
$$= \tan^{-1}(x) - \frac{\log\left(1+x^2\right)}{2x} - \frac{1}{2}\tan^{-1}(x)\log\left(1+x^2\right) - \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{2x^2} + \frac{1}{2}i\mathrm{I}$$

Mathematica [A] time = 0.03, size = 49, normalized size = 0.71

$$\frac{1}{2}i(\mathrm{Li}_2(-ix)-\mathrm{Li}_2(ix)) - \frac{\log\left(x^2+1\right)\left(x^2\tan^{-1}(x)+x+\tan^{-1}(x)\right)}{2x^2} + \tan^{-1}(x)$$

Antiderivative was successfully verified.

```
[In] Integrate[(ArcTan[x]*Log[1 + x^2])/x^3,x]
```

```
[Out] ArcTan[x] - ((x + ArcTan[x] + x^2*ArcTan[x])*Log[1 + x^2])/(2*x^2) + (I/2)*
(PolyLog[2, (-I)*x] - PolyLog[2, I*x])
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{\arctan(x)\log\left(x^2+1\right)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^3,x, algorithm="fricas")
```

```
[Out] integral(arctan(x)*log(x^2 + 1)/x^3, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\log\left(x^2+1\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^3,x, algorithm="giac")
```

```
[Out] integrate(arctan(x)*log(x^2 + 1)/x^3, x)
```

maple [F] time = 8.36, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\ln\left(x^2+1\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(x)*ln(x^2+1)/x^3,x)
```

```
[Out] int(arctan(x)*ln(x^2+1)/x^3,x)
```

maxima [A] time = 0.47, size = 70, normalized size = 1.01

$$\frac{4\,x^2\arctan(x)\log(x)+4\,x^2\arctan(x)-2i\,x^2\mathrm{Li}_2\,(i\,x+1)+2i\,x^2\mathrm{Li}_2\,(-i\,x+1)-\left(\pi x^2+2\left(x^2+1\right)\arctan(x)+2\,x\right.}{4\,x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^3,x, algorithm="maxima")
```

```
[Out] 1/4*(4*x^2*arctan(x)*log(x) + 4*x^2*arctan(x) - 2*I*x^2*dilog(I*x + 1) + 2*
I*x^2*dilog(-I*x + 1) - (pi*x^2 + 2*(x^2 + 1)*arctan(x) + 2*x)*log(x^2 + 1)
)/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((log(x^2 + 1)*atan(x))/x^3,x)
```

```
[Out] int((log(x^2 + 1)*atan(x))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(x^2+1\right)\mathrm{atan}\,(x)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(x)*ln(x**2+1)/x**3,x)
```

```
[Out] Integral(log(x**2 + 1)*atan(x)/x**3, x)
```

3.1283 $\int \frac{\tan^{-1}(x)\log(1+x^2)}{x^4}\,dx$

Optimal. Leaf size=81

$$\frac{\text{Li}_2(-x^2)}{6}+\frac{1}{12}\log^2(x^2+1)-\frac{\log(x^2+1)}{6x^2}-\frac{1}{2}\log(x^2+1)-\frac{\log(x^2+1)\tan^{-1}(x)}{3x^3}+\log(x)-\frac{1}{3}\tan^{-1}(x)^2-\frac{2\tan^{-1}(x)}{3x}$$

[Out] -2/3*arctan(x)/x-1/3*arctan(x)^2+ln(x)-1/2*ln(x^2+1)-1/6*ln(x^2+1)/x^2-1/3*arctan(x)*ln(x^2+1)/x^3+1/12*ln(x^2+1)^2+1/6*polylog(2,-x^2)

Rubi [A] time = 0.21, antiderivative size = 81, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 15, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.250, Rules used = {4852, 266, 44, 5017, 2475, 2410, 2395, 36, 29, 31, 2391, 2390, 2301, 4918, 4884}

$$\frac{1}{6}\text{PolyLog}(2,-x^2)+\frac{1}{12}\log^2(x^2+1)-\frac{\log(x^2+1)}{6x^2}-\frac{1}{2}\log(x^2+1)-\frac{\log(x^2+1)\tan^{-1}(x)}{3x^3}+\log(x)-\frac{1}{3}\tan^{-1}(x$$

Antiderivative was successfully verified.

[In] Int[(ArcTan[x]*Log[1 + x^2])/x^4,x]

[Out] (-2*ArcTan[x])/(3*x) - ArcTan[x]^2/3 + Log[x] - Log[1 + x^2]/2 - Log[1 + x^2]/(6*x^2) - (ArcTan[x]*Log[1 + x^2])/(3*x^3) + Log[1 + x^2]^2/12 + PolyLog[2, -x^2]/6

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x, x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] && !(IGtQ[n, 0] && LtQ[m + n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Log[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + (g_.)*(x_
))^(q_.), x_Symbol] :> Simp[((f + g*x)^(q + 1)*(a + b*Log[c*(d + e*x)^n]))/
(g*(q + 1)), x] - Dist[(b*e*n)/(g*(q + 1)), Int[(f + g*x)^(q + 1)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, q}, x] && NeQ[e*f - d*g, 0] && N
eQ[q, -1]
```

Rule 2410

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))]*(x_)^(m_.))/((f_) + (g_.)*(x_)), x_Symb
ol] :> Int[ExpandIntegrand[Log[c*(d + e*x)], x^m/(f + g*x), x], x] /; FreeQ
[{c, d, e, f, g}, x] && EqQ[e*f - d*g, 0] && EqQ[c*d, 1] && IntegerQ[m]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 5017

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> Simp[(x^(m + 1)*(d + e*Log[f + g*x^2])*(a +
```

```
b*ArcTan[c*x]))/(m + 1), x] + (-Dist[(b*c)/(m + 1), Int[(x^(m + 1)*(d + e*L
og[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[(2*e*g)/(m + 1), Int[(x^(m + 2
)*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c, d, e, f, g},
 x] && ILtQ[m/2, 0]
```

Rubi steps

$$\begin{aligned}\int \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x^4}\,dx &= -\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{3x^3}+\frac{1}{3}\int\frac{\log\left(1+x^2\right)}{x^3\left(1+x^2\right)}\,dx+\frac{2}{3}\int\frac{\tan^{-1}(x)}{x^2\left(1+x^2\right)}\,dx\\ &= -\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{3x^3}+\frac{1}{6}\text{Subst}\left(\int\frac{\log(1+x)}{x^2(1+x)}\,dx,x,x^2\right)+\frac{2}{3}\int\frac{\tan^{-1}(x)}{x^2}\,dx\\ &= -\frac{2\tan^{-1}(x)}{3x}-\frac{1}{3}\tan^{-1}(x)^2-\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{3x^3}+\frac{1}{6}\text{Subst}\left(\int\left(\frac{\log(1+x)}{x^2}\right.\right.\\ &= -\frac{2\tan^{-1}(x)}{3x}-\frac{1}{3}\tan^{-1}(x)^2-\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{3x^3}+\frac{1}{6}\text{Subst}\left(\int\frac{\log(1+x)}{x^2}\,dx\right.\\ &= -\frac{2\tan^{-1}(x)}{3x}-\frac{1}{3}\tan^{-1}(x)^2-\frac{\log\left(1+x^2\right)}{6x^2}-\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{3x^3}+\frac{\text{Li}_2\left(-x^2\right)}{6}\\ &= -\frac{2\tan^{-1}(x)}{3x}-\frac{1}{3}\tan^{-1}(x)^2+\frac{2\log(x)}{3}-\frac{1}{3}\log\left(1+x^2\right)-\frac{\log\left(1+x^2\right)}{6x^2}-\frac{\tan^{-1}(}{}\\ &= -\frac{2\tan^{-1}(x)}{3x}-\frac{1}{3}\tan^{-1}(x)^2+\log(x)-\frac{1}{2}\log\left(1+x^2\right)-\frac{\log\left(1+x^2\right)}{6x^2}-\frac{\tan^{-1}(x)}{}\end{aligned}$$

Mathematica [A] time = 0.01, size = 81, normalized size = 1.00

$$\frac{\text{Li}_2\left(-x^2\right)}{6}+\frac{1}{12}\log^2\left(x^2+1\right)-\frac{\log\left(x^2+1\right)}{6x^2}-\frac{1}{2}\log\left(x^2+1\right)-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{3x^3}+\log(x)-\frac{1}{3}\tan^{-1}(x)^2-\frac{2\tan^{-}}{3x}$$

Antiderivative was successfully verified.

```
[In] Integrate[(ArcTan[x]*Log[1 + x^2])/x^4,x]
```

```
[Out] (-2*ArcTan[x])/(3*x) - ArcTan[x]^2/3 + Log[x] - Log[1 + x^2]/2 - Log[1 + x^
2]/(6*x^2) - (ArcTan[x]*Log[1 + x^2])/(3*x^3) + Log[1 + x^2]^2/12 + PolyLog
[2, -x^2]/6
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(x)\log\left(x^2+1\right)}{x^4},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^4,x, algorithm="fricas")
```

```
[Out] integral(arctan(x)*log(x^2 + 1)/x^4, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int\frac{\arctan(x)\log\left(x^2+1\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^4,x, algorithm="giac")
```

```
[Out] integrate(arctan(x)*log(x^2 + 1)/x^4, x)
```

maple [F] time = 4.93, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\ln\left(x^2+1\right)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(x)*ln(x^2+1)/x^4,x)
```

```
[Out] int(arctan(x)*ln(x^2+1)/x^4,x)
```

maxima [A] time = 0.42, size = 95, normalized size = 1.17

$$-\frac{1}{3}\left(\frac{2}{x}+\frac{\log\left(x^2+1\right)}{x^3}+2\arctan(x)\right)\arctan(x)+\frac{4x^2\arctan(x)^2+x^2\log\left(x^2+1\right)^2-2x^2\mathrm{Li}_2\left(x^2+1\right)+12x^2\log}{12x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^4,x, algorithm="maxima")
```

```
[Out] -1/3*(2/x + log(x^2 + 1)/x^3 + 2*arctan(x))*arctan(x) + 1/12*(4*x^2*arctan(
x)^2 + x^2*log(x^2 + 1)^2 - 2*x^2*dilog(x^2 + 1) + 12*x^2*log(x) - 2*(x^2*l
og(-x^2) + 3*x^2 + 1)*log(x^2 + 1))/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{x^4}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((log(x^2 + 1)*atan(x))/x^4,x)
```

```
[Out] int((log(x^2 + 1)*atan(x))/x^4, x)
```

sympy [C] time = 28.09, size = 97, normalized size = 1.20

$$\frac{2\log(x)}{3}+\frac{\log\left(2x^2\right)}{6}+\frac{\log\left(x^2+1\right)^2}{12}-\frac{\log\left(x^2+1\right)}{3}-\frac{\log\left(2x^2+2\right)}{6}-\frac{\mathrm{atan}^2(x)}{3}+\frac{\mathrm{Li}_2\left(x^2e^{i\pi}\right)}{6}-\frac{2\,\mathrm{atan}(x)}{3x}-\frac{\log\left(x^2+\right.}{6x^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(x)*ln(x**2+1)/x**4,x)
```

```
[Out] 2*log(x)/3 + log(2*x**2)/6 + log(x**2 + 1)**2/12 - log(x**2 + 1)/3 - log(2*
x**2 + 2)/6 - atan(x)**2/3 + polylog(2, x**2*exp_polar(I*pi))/6 - 2*atan(x)
/(3*x) - log(x**2 + 1)/(6*x**2) - log(x**2 + 1)*atan(x)/(3*x**3)
```

3.1284 $\int \frac{\tan^{-1}(x)\log(1+x^2)}{x^5}\,dx$

Optimal. Leaf size=102

$$-\frac{1}{4}i\text{Li}_2(-ix)+\frac{1}{4}i\text{Li}_2(ix)+\frac{\log\left(x^2+1\right)}{4x}-\frac{\tan^{-1}(x)}{4x^2}+\frac{1}{4}\log\left(x^2+1\right)\tan^{-1}(x)-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{4x^4}-\frac{\log\left(x^2+1\right)}{12x^3}$$

```
[Out] -5/12/x-11/12*arctan(x)-1/4*arctan(x)/x^2-1/12*ln(x^2+1)/x^3+1/4*ln(x^2+1)/
x+1/4*arctan(x)*ln(x^2+1)-1/4*arctan(x)*ln(x^2+1)/x^4-1/4*I*polylog(2,-I*x)
+1/4*I*polylog(2,I*x)
```

Rubi [A] time = 0.13, antiderivative size = 102, normalized size of antiderivative = 1.00, number of steps used = 12, number of rules used = 8, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.667, Rules used = {4852, 325, 203, 5021, 453, 4980, 4848, 2391}

$$-\frac{1}{4}i\text{PolyLog}(2,-ix)+\frac{1}{4}i\text{PolyLog}(2,ix)+\frac{\log\left(x^2+1\right)}{4x}-\frac{\log\left(x^2+1\right)}{12x^3}-\frac{\tan^{-1}(x)}{4x^2}-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{4x^4}+\frac{1}{4}\log\left(\right.$$

Antiderivative was successfully verified.

```
[In] Int[(ArcTan[x]*Log[1 + x^2])/x^5,x]
```

```
[Out] -5/(12*x) - (11*ArcTan[x])/12 - ArcTan[x]/(4*x^2) - Log[1 + x^2]/(12*x^3) +
 Log[1 + x^2]/(4*x) + (ArcTan[x]*Log[1 + x^2])/4 - (ArcTan[x]*Log[1 + x^2])
/(4*x^4) - (I/4)*PolyLog[2, (-I)*x] + (I/4)*PolyLog[2, I*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 453

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(c*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*e*(m + 1)),
 x] + Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(a*e^n*(m + 1)), Int[(e*
x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, p}, x] && NeQ[b*c
 - a*d, 0] && (IntegerQ[n] || GtQ[e, 0]) && ((GtQ[n, 0] && LtQ[m, -1]) || (
LtQ[n, 0] && GtQ[m + n, -1])) &&  !ILtQ[p, -1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x^5}\,dx = -\frac{\log\left(1+x^2\right)}{12x^3}+\frac{\log\left(1+x^2\right)}{4x}+\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)-\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{4x^4}-2$$

$$= -\frac{\log\left(1+x^2\right)}{12x^3}+\frac{\log\left(1+x^2\right)}{4x}+\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)-\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{4x^4}-$$

$$= -\frac{1}{6x}-\frac{\log\left(1+x^2\right)}{12x^3}+\frac{\log\left(1+x^2\right)}{4x}+\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)-\frac{\tan^{-1}(x)\log\left(1+x\right.}{4x^4}$$

$$= -\frac{1}{6x}-\frac{2}{3}\tan^{-1}(x)-\frac{\log\left(1+x^2\right)}{12x^3}+\frac{\log\left(1+x^2\right)}{4x}+\frac{1}{4}\tan^{-1}(x)\log\left(1+x^2\right)-\frac{\tan^{-1}}{}$$

$$= -\frac{1}{6x}-\frac{2}{3}\tan^{-1}(x)-\frac{\tan^{-1}(x)}{4x^2}-\frac{\log\left(1+x^2\right)}{12x^3}+\frac{\log\left(1+x^2\right)}{4x}+\frac{1}{4}\tan^{-1}(x)\log\left(1+\right.$$

$$= -\frac{5}{12x}-\frac{2}{3}\tan^{-1}(x)-\frac{\tan^{-1}(x)}{4x^2}-\frac{\log\left(1+x^2\right)}{12x^3}+\frac{\log\left(1+x^2\right)}{4x}+\frac{1}{4}\tan^{-1}(x)\log\left(1+\right.$$

$$= -\frac{5}{12x}-\frac{11}{12}\tan^{-1}(x)-\frac{\tan^{-1}(x)}{4x^2}-\frac{\log\left(1+x^2\right)}{12x^3}+\frac{\log\left(1+x^2\right)}{4x}+\frac{1}{4}\tan^{-1}(x)\log\left(1\right.$$

Mathematica [A] time = 0.04, size = 98, normalized size = 0.96

$$-\frac{1}{4}i(\text{Li}_2(-ix)-\text{Li}_2(ix))+\frac{1}{2}\left(\frac{1}{2}\left(-\frac{1}{x}-\tan^{-1}(x)\right)-\frac{\tan^{-1}(x)}{2x^2}\right)+\frac{\log\left(x^2+1\right)\left(3x^4\tan^{-1}(x)+3x^3-x-3\tan^{-1}(x)\right)}{12x^4}-$$

Antiderivative was successfully verified.

```
[In] Integrate[(ArcTan[x]*Log[1 + x^2])/x^5,x]
```

```
[Out] -1/6*1/x - (2*ArcTan[x])/3 + ((-x^(-1) - ArcTan[x])/2 - ArcTan[x]/(2*x^2))/
2 + ((-x + 3*x^3 - 3*ArcTan[x] + 3*x^4*ArcTan[x])*Log[1 + x^2])/(12*x^4) -
(I/4)*(PolyLog[2, (-I)*x] - PolyLog[2, I*x])
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(x)\log\left(x^2+1\right)}{x^5}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^5,x, algorithm="fricas")
```

```
[Out] integral(arctan(x)*log(x^2 + 1)/x^5, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\log\left(x^2+1\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^5,x, algorithm="giac")
```

```
[Out] integrate(arctan(x)*log(x^2 + 1)/x^5, x)
```

maple [F] time = 8.10, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\ln\left(x^2+1\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(x)*ln(x^2+1)/x^5,x)
```

```
[Out] int(arctan(x)*ln(x^2+1)/x^5,x)
```

maxima [A] time = 0.49, size = 89, normalized size = 0.87

$$-\frac{12\,x^4\arctan(x)\log(x) - 6i\,x^4\mathrm{Li}_2\left(i\,x+1\right) + 6i\,x^4\mathrm{Li}_2\left(-i\,x+1\right) + 10\,x^3 + 2\left(11\,x^4+3\,x^2\right)\arctan(x) - \left(3\,\pi x^4 +\right.}{24\,x^4}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^5,x, algorithm="maxima")
```

```
[Out] -1/24*(12*x^4*arctan(x)*log(x) - 6*I*x^4*dilog(I*x + 1) + 6*I*x^4*dilog(-I*
x + 1) + 10*x^3 + 2*(11*x^4 + 3*x^2)*arctan(x) - (3*pi*x^4 + 6*x^3 + 6*(x^4
 - 1)*arctan(x) - 2*x)*log(x^2 + 1))/x^4
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((log(x^2 + 1)*atan(x))/x^5,x)
```

```
[Out] int((log(x^2 + 1)*atan(x))/x^5, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\log\left(x^2+1\right)\mathrm{atan}\,(x)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(x)*ln(x**2+1)/x**5,x)
```

```
[Out] Integral(log(x**2 + 1)*atan(x)/x**5, x)
```

3.1285 $\int \frac{\tan^{-1}(x)\log(1+x^2)}{x^6}\,dx$

Optimal. Leaf size=114

$$-\frac{\text{Li}_2(-x^2)}{10}-\frac{2\tan^{-1}(x)}{15x^3}-\frac{7}{60x^2}-\frac{1}{20}\log^2(x^2+1)+\frac{\log(x^2+1)}{10x^2}+\frac{5}{12}\log(x^2+1)-\frac{\log(x^2+1)\tan^{-1}(x)}{5x^5}-\frac{\log(x^2+}{20x^4}$$

```
[Out] -7/60/x^2-2/15*arctan(x)/x^3+2/5*arctan(x)/x+1/5*arctan(x)^2-5/6*ln(x)+5/12
*ln(x^2+1)-1/20*ln(x^2+1)/x^4+1/10*ln(x^2+1)/x^2-1/5*arctan(x)*ln(x^2+1)/x^
5-1/20*ln(x^2+1)^2-1/10*polylog(2,-x^2)
```

Rubi [A] time = 0.28, antiderivative size = 114, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 15, integrand size = 12, $\frac{\text{number of rules}}{\text{integrand size}}$ = 1.250, Rules used = {4852, 266, 44, 5017, 2475, 2410, 2390, 2301, 2395, 36, 29, 31, 2391, 4918, 4884}

$$-\frac{1}{10}\text{PolyLog}(2,-x^2)-\frac{7}{60x^2}-\frac{1}{20}\log^2(x^2+1)+\frac{\log(x^2+1)}{10x^2}-\frac{\log(x^2+1)}{20x^4}+\frac{5}{12}\log(x^2+1)-\frac{2\tan^{-1}(x)}{15x^3}-\frac{\log(x^2}{}$$

Antiderivative was successfully verified.

```
[In] Int[(ArcTan[x]*Log[1 + x^2])/x^6,x]
```

```
[Out] -7/(60*x^2) - (2*ArcTan[x])/(15*x^3) + (2*ArcTan[x])/(5*x) + ArcTan[x]^2/5
- (5*Log[x])/6 + (5*Log[1 + x^2])/12 - Log[1 + x^2]/(20*x^4) + Log[1 + x^2]
/(10*x^2) - (ArcTan[x]*Log[1 + x^2])/(5*x^5) - Log[1 + x^2]^2/20 - PolyLog[
2, -x^2]/10
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + (g_.)*(x_
))^(q_.), x_Symbol] :> Simp[((f + g*x)^(q + 1)*(a + b*Log[c*(d + e*x)^n]))/
(g*(q + 1)), x] - Dist[(b*e*n)/(g*(q + 1)), Int[(f + g*x)^(q + 1)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, q}, x] && NeQ[e*f - d*g, 0] && N
eQ[q, -1]
```

Rule 2410

```
Int[(Log[(c_.)*((d_) + (e_.)*(x_))]*(x_)^(m_.))/((f_) + (g_.)*(x_)), x_Symb
ol] :> Int[ExpandIntegrand[Log[c*(d + e*x)], x^m/(f + g*x), x], x] /; FreeQ
[{c, d, e, f, g}, x] && EqQ[e*f - d*g, 0] && EqQ[c*d, 1] && IntegerQ[m]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 5017

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> Simp[(x^(m + 1)*(d + e*Log[f + g*x^2])*(a +
```

```
b*ArcTan[c*x]))/(m + 1), x] + (-Dist[(b*c)/(m + 1), Int[(x^(m + 1)*(d + e*L
og[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[(2*e*g)/(m + 1), Int[(x^(m + 2
)*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c, d, e, f, g},
 x] && ILtQ[m/2, 0]
```

Rubi steps

$$\int \frac{\tan^{-1}(x)\log\left(1+x^2\right)}{x^6}\,dx = -\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{5x^5}+\frac{1}{5}\int \frac{\log\left(1+x^2\right)}{x^5\left(1+x^2\right)}\,dx+\frac{2}{5}\int \frac{\tan^{-1}(x)}{x^4\left(1+x^2\right)}\,dx$$

$$= -\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{5x^5}+\frac{1}{10}\text{Subst}\left(\int \frac{\log(1+x)}{x^3(1+x)}\,dx,x,x^2\right)+\frac{2}{5}\int \frac{\tan^{-1}(x)}{x^4}\,dx-$$

$$= -\frac{2\tan^{-1}(x)}{15x^3}-\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{5x^5}+\frac{1}{10}\text{Subst}\left(\int \left(\frac{\log(1+x)}{-1-x}+\frac{\log(1+x)}{x^3}-\right.\right.$$

$$= -\frac{2\tan^{-1}(x)}{15x^3}+\frac{2\tan^{-1}(x)}{5x}+\frac{1}{5}\tan^{-1}(x)^2-\frac{\tan^{-1}(x)\log\left(1+x^2\right)}{5x^5}+\frac{1}{15}\text{Subst}\left(\int \right.$$

$$= -\frac{2\tan^{-1}(x)}{15x^3}+\frac{2\tan^{-1}(x)}{5x}+\frac{1}{5}\tan^{-1}(x)^2-\frac{\log\left(1+x^2\right)}{20x^4}+\frac{\log\left(1+x^2\right)}{10x^2}-\frac{\tan^{-1}(x)}{}$$

$$= -\frac{1}{15x^2}-\frac{2\tan^{-1}(x)}{15x^3}+\frac{2\tan^{-1}(x)}{5x}+\frac{1}{5}\tan^{-1}(x)^2-\frac{2\log(x)}{15}+\frac{1}{15}\log\left(1+x^2\right)-$$

$$= -\frac{7}{60x^2}-\frac{2\tan^{-1}(x)}{15x^3}+\frac{2\tan^{-1}(x)}{5x}+\frac{1}{5}\tan^{-1}(x)^2-\frac{5\log(x)}{6}+\frac{5}{12}\log\left(1+x^2\right)-$$

Mathematica [A] time = 0.03, size = 114, normalized size = 1.00

$$-\frac{\text{Li}_2\left(-x^2\right)}{10}-\frac{2\tan^{-1}(x)}{15x^3}-\frac{7}{60x^2}-\frac{1}{20}\log^2\left(x^2+1\right)+\frac{\log\left(x^2+1\right)}{10x^2}+\frac{5}{12}\log\left(x^2+1\right)-\frac{\log\left(x^2+1\right)\tan^{-1}(x)}{5x^5}-\frac{\log\left(x^2+\right.}{20x^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[(ArcTan[x]*Log[1 + x^2])/x^6,x]
```

```
[Out] -7/(60*x^2) - (2*ArcTan[x])/(15*x^3) + (2*ArcTan[x])/(5*x) + ArcTan[x]^2/5
- (5*Log[x])/6 + (5*Log[1 + x^2])/12 - Log[1 + x^2]/(20*x^4) + Log[1 + x^2]
/(10*x^2) - (ArcTan[x]*Log[1 + x^2])/(5*x^5) - Log[1 + x^2]^2/20 - PolyLog[
2, -x^2]/10
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{\arctan(x)\log\left(x^2+1\right)}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^6,x, algorithm="fricas")
```

```
[Out] integral(arctan(x)*log(x^2 + 1)/x^6, x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x)\log\left(x^2+1\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^6,x, algorithm="giac")
[Out] integrate(arctan(x)*log(x^2 + 1)/x^6, x)
```

maple [F] time = 5.15, size = 0, normalized size = 0.00

$$\int \frac{\arctan(x) \ln \left(x^2+1\right)}{x^6} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(arctan(x)*ln(x^2+1)/x^6,x)
[Out] int(arctan(x)*ln(x^2+1)/x^6,x)
```

maxima [A] time = 0.43, size = 115, normalized size = 1.01

$$\frac{1}{15}\left(\frac{2\left(3x^2-1\right)}{x^3}-\frac{3\log\left(x^2+1\right)}{x^5}+6\arctan(x)\right)\arctan(x)-\frac{12x^4\arctan(x)^2+3x^4\log\left(x^2+1\right)^2-6x^4\mathrm{Li}_2\left(x\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(arctan(x)*log(x^2+1)/x^6,x, algorithm="maxima")
[Out] 1/15*(2*(3*x^2 - 1)/x^3 - 3*log(x^2 + 1)/x^5 + 6*arctan(x))*arctan(x) - 1/6
0*(12*x^4*arctan(x)^2 + 3*x^4*log(x^2 + 1)^2 - 6*x^4*dilog(x^2 + 1) + 50*x^
4*log(x) + 7*x^2 - (6*x^4*log(-x^2) + 25*x^4 + 6*x^2 - 3)*log(x^2 + 1))/x^4
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\ln\left(x^2+1\right)\,\mathrm{atan}(x)}{x^6} dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((log(x^2 + 1)*atan(x))/x^6,x)
[Out] int((log(x^2 + 1)*atan(x))/x^6, x)
```

sympy [C] time = 38.32, size = 134, normalized size = 1.18

$$-\frac{8\log(x)}{15}-\frac{\log\left(x^2\right)}{20}-\frac{\log\left(2x^2\right)}{10}-\frac{\log\left(x^2+1\right)^2}{20}+\frac{19\log\left(x^2+1\right)}{60}+\frac{\log\left(2x^2+2\right)}{10}+\frac{\mathrm{atan}^2(x)}{5}-\frac{\mathrm{Li}_2\left(x^2e^{i\pi}\right)}{10}+\frac{2\,\mathrm{ata}}{5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(atan(x)*ln(x**2+1)/x**6,x)
[Out] -8*log(x)/15 - log(x**2)/20 - log(2*x**2)/10 - log(x**2 + 1)**2/20 + 19*log
(x**2 + 1)/60 + log(2*x**2 + 2)/10 + atan(x)**2/5 - polylog(2, x**2*exp_pol
ar(I*pi))/10 + 2*atan(x)/(5*x) + log(x**2 + 1)/(10*x**2) - 7/(60*x**2) - 2*
atan(x)/(15*x**3) - log(x**2 + 1)/(20*x**4) - log(x**2 + 1)*atan(x)/(5*x**5
)
```

3.1286 $\int x^4 \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)\,dx$

Optimal. Leaf size=278

$$\frac{1}{5}x^5\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)+\frac{2ae\tan^{-1}(cx)}{5c^5}-\frac{2aex}{5c^4}+\frac{2aex^3}{15c^2}-\frac{2}{25}aex^5+\frac{be\tan^{-1}(cx)^2}{5c^5}-\frac{2bex\tan^{-1}(cx}{5c^4}$$

```
[Out] -2/5*a*e*x/c^4-77/300*b*e*x^2/c^3+2/15*a*e*x^3/c^2+9/200*b*e*x^4/c-2/25*a*e
*x^5+2/5*a*e*arctan(c*x)/c^5-2/5*b*e*x*arctan(c*x)/c^4+2/15*b*e*x^3*arctan(
c*x)/c^2-2/25*b*e*x^5*arctan(c*x)+1/5*b*e*arctan(c*x)^2/c^5+137/300*b*e*ln(
c^2*x^2+1)/c^5+1/20*b*e*ln(c^2*x^2+1)^2/c^5+1/10*b*x^2*(d+e*ln(c^2*x^2+1))/
c^3-1/20*b*x^4*(d+e*ln(c^2*x^2+1))/c+1/5*x^5*(a+b*arctan(c*x))*(d+e*ln(c^2*
x^2+1))-1/10*b*ln(c^2*x^2+1)*(d+e*ln(c^2*x^2+1))/c^5
```

Rubi [A] time = 0.69, antiderivative size = 278, normalized size of antiderivative = 1.00, number of steps used = 26, number of rules used = 15, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.577, Rules used = {4852, 266, 43, 5021, 6725, 1802, 635, 203, 260, 4916, 4846, 4884, 2475, 2390, 2301}

$$\frac{1}{5}x^5\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)+\frac{2aex^3}{15c^2}-\frac{2aex}{5c^4}+\frac{2ae\tan^{-1}(cx)}{5c^5}-\frac{2}{25}aex^5-\frac{bx^4\left(e\log\left(c^2x^2+1\right)+d\right)}{20c}+-\frac{b}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^4*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] (-2*a*e*x)/(5*c^4) - (77*b*e*x^2)/(300*c^3) + (2*a*e*x^3)/(15*c^2) + (9*b*e
*x^4)/(200*c) - (2*a*e*x^5)/25 + (2*a*e*ArcTan[c*x])/(5*c^5) - (2*b*e*x*Arc
Tan[c*x])/(5*c^4) + (2*b*e*x^3*ArcTan[c*x])/(15*c^2) - (2*b*e*x^5*ArcTan[c*
x])/25 + (b*e*ArcTan[c*x]^2)/(5*c^5) + (137*b*e*Log[1 + c^2*x^2])/(300*c^5)
 + (b*e*Log[1 + c^2*x^2]^2)/(20*c^5) + (b*x^2*(d + e*Log[1 + c^2*x^2]))/(10
*c^3) - (b*x^4*(d + e*Log[1 + c^2*x^2]))/(20*c) + (x^5*(a + b*ArcTan[c*x])*
(d + e*Log[1 + c^2*x^2]))/5 - (b*Log[1 + c^2*x^2]*(d + e*Log[1 + c^2*x^2]))
/(10*c^5)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int x^4\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)\,dx=\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{10c^3}-\frac{bx^4\left(d+e\log\left(1+c^2x^2\right)\right)}{20c}+\frac{1}{5}x^5\left(\right.$$

$$=\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{10c^3}-\frac{bx^4\left(d+e\log\left(1+c^2x^2\right)\right)}{20c}+\frac{1}{5}x^5\left(\right.$$

$$=\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{10c^3}-\frac{bx^4\left(d+e\log\left(1+c^2x^2\right)\right)}{20c}+\frac{1}{5}x^5\left(\right.$$

$$=\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{10c^3}-\frac{bx^4\left(d+e\log\left(1+c^2x^2\right)\right)}{20c}+\frac{1}{5}x^5\left(\right.$$

$$=\frac{be\log^2\left(1+c^2x^2\right)}{20c^5}+\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{10c^3}-\frac{bx^4\left(d+e\log\right.}{2\!\!\!\!\quad}$$

$$=-\frac{2aex}{5c^4}-\frac{3bex^2}{20c^3}+\frac{2aex^3}{15c^2}+\frac{bex^4}{40c}-\frac{2}{25}aex^5-\frac{2}{25}bex^5\tan^{-1}(cx)$$

$$=-\frac{2aex}{5c^4}-\frac{3bex^2}{20c^3}+\frac{2aex^3}{15c^2}+\frac{bex^4}{40c}-\frac{2}{25}aex^5+\frac{2bex^3\tan^{-1}(cx)}{15c^2}$$

$$=-\frac{2aex}{5c^4}-\frac{3bex^2}{20c^3}+\frac{2aex^3}{15c^2}+\frac{bex^4}{40c}-\frac{2}{25}aex^5+\frac{2ae\tan^{-1}(cx)}{5c^5}-$$

$$=-\frac{2aex}{5c^4}-\frac{19bex^2}{100c^3}+\frac{2aex^3}{15c^2}+\frac{9bex^4}{200c}-\frac{2}{25}aex^5+\frac{2ae\tan^{-1}(cx)}{5c^5}$$

$$=-\frac{2aex}{5c^4}-\frac{77bex^2}{300c^3}+\frac{2aex^3}{15c^2}+\frac{9bex^4}{200c}-\frac{2}{25}aex^5+\frac{2ae\tan^{-1}(cx)}{5c^5}$$

Mathematica [A] time = 0.19, size = 214, normalized size = 0.77

$$\frac{cx\left(8a\left(15c^4dx^4-2e\left(3c^4x^4-5c^2x^2+15\right)\right)+bcx\left(e\left(27c^2x^2-154\right)-30d\left(c^2x^2-2\right)\right)\right)+\log\left(c^2x^2+1\right)\left(120ac^5ex\right.}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^4*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] (c*x*(b*c*x*(-30*d*(-2 + c^2*x^2) + e*(-154 + 27*c^2*x^2)) + 8*a*(15*c^4*d*
x^4 - 2*e*(15 - 5*c^2*x^2 + 3*c^4*x^4))) + 120*b*e*ArcTan[c*x]^2 + (-60*b*d
 + 120*a*c^5*e*x^5 + 2*b*e*(137 + 30*c^2*x^2 - 15*c^4*x^4))*Log[1 + c^2*x^2
```

```
] - 30*b*e*Log[1 + c^2*x^2]^2 + 8*ArcTan[c*x]*(30*a*e + 15*b*c^5*d*x^5 - 2*
b*c*e*x*(15 - 5*c^2*x^2 + 3*c^4*x^4) + 15*b*c^5*e*x^5*Log[1 + c^2*x^2]))/(6
00*c^5)
```

fricas [A] time = 0.56, size = 220, normalized size = 0.79

$$\frac{80\,ac^3ex^3 + 24\left(5\,ac^5d - 2\,ac^5e\right)x^5 - 3\left(10\,bc^4d - 9\,bc^4e\right)x^4 - 240\,acex + 120\,be\arctan\left(cx\right)^2 - 30\,be\log\left(c^2x^2 + \right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="fricas")
```

```
[Out] 1/600*(80*a*c^3*e*x^3 + 24*(5*a*c^5*d - 2*a*c^5*e)*x^5 - 3*(10*b*c^4*d - 9*
b*c^4*e)*x^4 - 240*a*c*e*x + 120*b*e*arctan(c*x)^2 - 30*b*e*log(c^2*x^2 + 1
)^2 + 2*(30*b*c^2*d - 77*b*c^2*e)*x^2 + 8*(10*b*c^3*e*x^3 + 3*(5*b*c^5*d -
2*b*c^5*e)*x^5 - 30*b*c*e*x + 30*a*e)*arctan(c*x) + 2*(60*b*c^5*e*x^5*arcta
n(c*x) + 60*a*c^5*e*x^5 - 15*b*c^4*e*x^4 + 30*b*c^2*e*x^2 - 30*b*d + 137*b*
e)*log(c^2*x^2 + 1))/c^5
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 3.80, size = 4941, normalized size = 17.77

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1)),x)
```

```
[Out] -181/600*e/c^5*b-1/10*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^
2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I/((1+I*c*x)^2/(c^2*x^2+1
)+1)^2)*arctan(c*x)*Pi*x^5*e+1/40*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csg
n(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I/((1+I*c*x
)^2/(c^2*x^2+1)+1)^2)*Pi*x^4*e-1/20*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))
*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I/((1+I
*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^2*e-1/10*I/c^5*b*csgn(I*(1+I*c*x)^2/(c^2*x^2
+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I/(
(1+I*c*x)^2/(c^2*x^2+1)+1)^2)*e*Pi*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+3/40*I/c^5
*b*Pi*e*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1
)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2+3/20*I/c^5*b*Pi*e*csgn(I*(1+I*c*x)/(c^2*
x^2+1)^(1/2))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2-1/10*I/c^5*b*ln((1+I*c*x)^2
/(c^2*x^2+1)+1)*e*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3+1/10*I/c^5*b*ln((1+I
*c*x)^2/(c^2*x^2+1)+1)*e*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3-1/10*I/
c^5*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*e*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1
+I*c*x)^2/(c^2*x^2+1)+1)^2)^3-3/20*I/c^5*b*Pi*e*csgn(I*((1+I*c*x)^2/(c^2*x^
2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2-2/25*a*e*x^5-2/5*b*e*x*arc
tan(c*x)/c^4+2/15*b*e*x^3*arctan(c*x)/c^2+3/10/c^5*b*ln(2)*e-2/5*a*e*x/c^4-
77/300*b*e*x^2/c^3+2/15*a*e*x^3/c^2+2/5*a*e*arctan(c*x)/c^5-2/25*b*e*x^5*ar
ctan(c*x)-1/10/c^5*b*arctan(c*x)*Pi*e*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3-1/1
0/c^5*b*arctan(c*x)*Pi*e*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x
^2+1)+1)^2)^3+1/10/c^5*b*arctan(c*x)*Pi*e*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1
)^2)^3+3/40*I/c^5*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*e-3/40*I/c^5
*b*Pi*e*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3-3/4
```

0*I/c^5*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*e-2/5*I/c^5*b*arctan(c*x)*ln
(2)*e+1/5*x^5*a*d+1/10/c^5*b*e*(4*arctan(c*x)*x^5*c^5-c^4*x^4-4*I*arctan(c*
x)+2*c^2*x^2+4*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+3)*ln((1+I*c*x)/(c^2*x^2+1)^(1
/2))+1/10*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1
)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*arctan(c*x)*Pi*x^5*e-1/5*I*b*csgn(I*((1+
I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*arctan(c*x
)*Pi*x^5*e-1/20/c*b*x^4*d+1/10/c^3*b*d*x^2+1/5*a*e*x^5*ln(c^2*x^2+1)+1/5/c^
5*b*arctan(c*x)*Pi*e*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*csgn(I*(1+I*c*x)^2
/(c^2*x^2+1))^2+1/10/c^5*b*arctan(c*x)*Pi*e*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)
+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2-137/
150/c^5*b*e*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/5/c^5*b*d*ln((1+I*c*x)^2/(c^2*x
^2+1)+1)-1/5/c^5*b*e*ln((1+I*c*x)^2/(c^2*x^2+1)+1)^2+1/5*b*arctan(c*x)*x^5*
d-1/5/c^5*b*arctan(c*x)*Pi*e*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1
+I*c*x)^2/(c^2*x^2+1)+1)^2)^2+1/10/c^5*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1
+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*arctan(c*x)*P
i*e+1/10/c*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*x^4*e-1/5/c^3*b*ln((1+I*c*x)^2/(
c^2*x^2+1)+1)*x^2*e-1/10/c*b*ln(2)*x^4*e+1/5/c^3*b*ln(2)*x^2*e+2/5/c^5*b*e*
ln(2)*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+2/5*b*ln(2)*arctan(c*x)*x^5*e-2/5*b*ln(
(1+I*c*x)^2/(c^2*x^2+1)+1)*arctan(c*x)*x^5*e-1/5*I/c^5*b*arctan(c*x)*d+46/7
5*I/c^5*b*e*arctan(c*x)+1/5*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1
+I*c*x)/(c^2*x^2+1)^(1/2))*arctan(c*x)*Pi*x^5*e-1/10*I*b*csgn(I*(1+I*c*x)^2
/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*arctan(c*x)*Pi*x^5*e+1/
10*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn
(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*arctan(c*x)*Pi*x^5*e+1/10*I*b*csgn(I*((1+
I*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*arctan(c*x
)*Pi*x^5*e-3/40*I/c^5*b*Pi*e*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(
1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^
2+1)+1)^2)+1/40*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^2
*x^2+1)^(1/2))^2*Pi*x^4*e+1/20*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*cs
gn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^4*e-1/20*I/c*b*csgn(I*(1+I*c*x)^
2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*Pi*x^4*e-1/40*I/c*b*cs
gn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(
c^2*x^2+1)+1)^2)^2*Pi*x^4*e-1/10*I/c^3*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)
)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^2*e+1/10*I/c^3*b*csgn(I*(1+I
*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*Pi*x^2*e+1/20*I/
c^3*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)
+1)^2)*Pi*x^2*e+1/20*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*
x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^2*e+1/20*I/c^3*b*csg
n(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c
*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^2*e-1/20*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1
))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*Pi*x^2*e-1/40*I/c*b*csgn(I*(1+I*c*
x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c*x)^2/(c^2*
x^2+1)+1)^2)*Pi*x^4*e-1/40*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*csgn
(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^4*e-1/5*I/c^5*b*ln((1+I*c*x)^2/(c^2*
x^2+1)+1)*e*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2
*x^2+1)+1)^2)^2+1/10*I/c^5*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*e*Pi*csgn(I*(1+I
*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1
)+1)^2)^2-1/10*I/c^5*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^
2*x^2+1)^(1/2))^2*e*Pi*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/5*I/c^5*b*csgn(I*(1+
I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*e*Pi*ln((1+I*c*
x)^2/(c^2*x^2+1)+1)+1/10*I/c^5*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn
(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*Pi*e*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/10*I
/c^5*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*e*Pi*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1
)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2-1/10/c
^5*b*arctan(c*x)*Pi*e*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x
)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)
^2)-3/40*I/c^5*b*Pi*e*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*csgn(I*(1+I*c*x
)^2/(c^2*x^2+1))-1/20*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*x^2*e+1/
40*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi

```
*x^4*e+1/40*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*x^4*e-1/40*I/c*b*csg
n(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^4*e+1/20*I/c^3*b*csgn(I*((1+I*c*x
)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^2*e-1/10*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((
1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*arctan(c*x)*Pi*x^5*e+1/10*I*b*csgn(I*((1+I*c
*x)^2/(c^2*x^2+1)+1)^2)^3*arctan(c*x)*Pi*x^5*e-1/10*I*b*csgn(I*(1+I*c*x)^2/
(c^2*x^2+1))^3*arctan(c*x)*Pi*x^5*e+1/10/c^5*b*arctan(c*x)*Pi*e*csgn(I*((1+
I*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)+3/20/c^5*b
*d-1/10/c^5*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^
(1/2))^2*arctan(c*x)*Pi*e-1/20*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I
*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^2*e+3/40*I/c^5*b*Pi*e*csgn(I*(1+I*c*x)^2/(
c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2
+3/40*I/c^5*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*((1+I*c*x)^2/(c^
2*x^2+1)+1))^2*Pi*e+9/200*b*e*x^4/c
```

maxima [A] time = 0.43, size = 256, normalized size = 0.92

$$\frac{1}{5}adx^5+\frac{1}{75}\left(15x^5\log\left(c^2x^2+1\right)-2c^2\left(\frac{3c^4x^5-5c^2x^3+15x}{c^6}-\frac{15\arctan(cx)}{c^7}\right)\right)be\arctan(cx)+\frac{1}{20}\left(4x^5\text{arct}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^4*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="maxima")
```

```
[Out] 1/5*a*d*x^5 + 1/75*(15*x^5*log(c^2*x^2 + 1) - 2*c^2*((3*c^4*x^5 - 5*c^2*x^3
 + 15*x)/c^6 - 15*arctan(c*x)/c^7))*b*e*arctan(c*x) + 1/20*(4*x^5*arctan(c*
x) - c*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*d + 1/75*(15*x^5
*log(c^2*x^2 + 1) - 2*c^2*((3*c^4*x^5 - 5*c^2*x^3 + 15*x)/c^6 - 15*arctan(c
*x)/c^7))*a*e + 1/600*(27*c^4*x^4 - 154*c^2*x^2 - 120*arctan(c*x)^2 - 2*(15
*c^4*x^4 - 30*c^2*x^2 - 137)*log(c^2*x^2 + 1) - 30*log(c^2*x^2 + 1)^2)*b*e/
c^5
```

mupad [B] time = 3.35, size = 276, normalized size = 0.99

$$\frac{a\,d\,x^5}{5}-\frac{2\,a\,e\,x^5}{25}-\frac{b\,e\ln\left(c^2\,x^2+1\right)^2}{20\,c^5}-\frac{2\,a\,e\,x}{5\,c^4}+\frac{2\,a\,e\,\mathrm{atan}\left(c\,x\right)}{5\,c^5}+\frac{b\,d\,x^5\,\mathrm{atan}\left(c\,x\right)}{5}-\frac{2\,b\,e\,x^5\,\mathrm{atan}\left(c\,x\right)}{25}-\frac{b\,d\,\ln\left(c^2\,x^2+\right.}{10\,c^5}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^4*(a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)),x)
```

```
[Out] (a*d*x^5)/5 - (2*a*e*x^5)/25 - (b*e*log(c^2*x^2 + 1)^2)/(20*c^5) - (2*a*e*x
)/(5*c^4) + (2*a*e*atan(c*x))/(5*c^5) + (b*d*x^5*atan(c*x))/5 - (2*b*e*x^5*
atan(c*x))/25 - (b*d*log(c^2*x^2 + 1))/(10*c^5) + (137*b*e*log(c^2*x^2 + 1)
)/(300*c^5) + (2*a*e*x^3)/(15*c^2) - (b*d*x^4)/(20*c) + (b*d*x^2)/(10*c^3)
+ (9*b*e*x^4)/(200*c) - (77*b*e*x^2)/(300*c^3) + (a*e*x^5*log(c^2*x^2 + 1))
/5 + (b*e*atan(c*x)^2)/(5*c^5) + (2*b*e*x^3*atan(c*x))/(15*c^2) + (b*e*x^5*
atan(c*x)*log(c^2*x^2 + 1))/5 - (b*e*x^4*log(c^2*x^2 + 1))/(20*c) + (b*e*x^
2*log(c^2*x^2 + 1))/(10*c^3) - (2*b*e*x*atan(c*x))/(5*c^4)
```

sympy [A] time = 13.49, size = 338, normalized size = 1.22

$$\begin{cases}\frac{adx^5}{5}+\frac{aex^5\log\left(c^2x^2+1\right)}{5}-\frac{2aex^5}{25}+\frac{2aex^3}{15c^2}-\frac{2aex}{5c^4}+\frac{2ae\,\mathrm{atan}\,(cx)}{5c^5}+\frac{bdx^5\,\mathrm{atan}\,(cx)}{5}+\frac{bex^5\log\left(c^2x^2+1\right)\mathrm{atan}\,(cx)}{5}-\frac{2bex^5\,\mathrm{atan}\,(cx)}{25}-\\ \frac{adx^5}{5}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**4*(a+b*atan(c*x))*(d+e*ln(c**2*x**2+1)),x)
```

```
[Out] Piecewise((a*d*x**5/5 + a*e*x**5*log(c**2*x**2 + 1)/5 - 2*a*e*x**5/25 + 2*a
*e*x**3/(15*c**2) - 2*a*e*x/(5*c**4) + 2*a*e*atan(c*x)/(5*c**5) + b*d*x**5*
atan(c*x)/5 + b*e*x**5*log(c**2*x**2 + 1)*atan(c*x)/5 - 2*b*e*x**5*atan(c*x
)/25 - b*d*x**4/(20*c) - b*e*x**4*log(c**2*x**2 + 1)/(20*c) + 9*b*e*x**4/(2
00*c) + 2*b*e*x**3*atan(c*x)/(15*c**2) + b*d*x**2/(10*c**3) + b*e*x**2*log(
c**2*x**2 + 1)/(10*c**3) - 77*b*e*x**2/(300*c**3) - 2*b*e*x*atan(c*x)/(5*c*
*4) - b*d*log(c**2*x**2 + 1)/(10*c**5) - b*e*log(c**2*x**2 + 1)**2/(20*c**5
) + 137*b*e*log(c**2*x**2 + 1)/(300*c**5) + b*e*atan(c*x)**2/(5*c**5), Ne(c
, 0)), (a*d*x**5/5, True))
```

3.1287 $\int x^3 \left(a + b\tan^{-1}(cx)\right)\left(d + e\log\left(1 + c^2x^2\right)\right)\,dx$

Optimal. Leaf size=221

$$\frac{1}{4}x^4\left(a + b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)+\frac{ex^2\left(a + b\tan^{-1}(cx)\right)}{4c^2}-\frac{e\log\left(c^2x^2+1\right)\left(a + b\tan^{-1}(cx)\right)}{4c^4}-\frac{1}{8}ex^4\left(a\right.$$

```
[Out] 1/8*b*(2*d-3*e)*x/c^3-2/3*b*e*x/c^3-1/24*b*(2*d-e)*x^3/c+1/18*b*e*x^3/c-1/8
*b*(2*d-3*e)*arctan(c*x)/c^4+2/3*b*e*arctan(c*x)/c^4+1/4*e*x^2*(a+b*arctan(
c*x))/c^2-1/8*e*x^4*(a+b*arctan(c*x))+1/4*b*e*x*ln(c^2*x^2+1)/c^3-1/12*b*e*
x^3*ln(c^2*x^2+1)/c-1/4*e*(a+b*arctan(c*x))*ln(c^2*x^2+1)/c^4+1/4*x^4*(a+b*
arctan(c*x))*(d+e*ln(c^2*x^2+1))
```

Rubi [A] time = 0.24, antiderivative size = 221, normalized size of antiderivative = 1.00, number of steps used = 14, number of rules used = 11, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.423, Rules used = {2454, 2395, 43, 5019, 459, 321, 203, 2471, 2448, 2455, 302}

$$\frac{1}{4}x^4\left(a + b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)+\frac{ex^2\left(a + b\tan^{-1}(cx)\right)}{4c^2}-\frac{e\log\left(c^2x^2+1\right)\left(a + b\tan^{-1}(cx)\right)}{4c^4}-\frac{1}{8}ex^4\left(a\right.$$

Antiderivative was successfully verified.

```
[In] Int[x^3*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] (b*(2*d - 3*e)*x)/(8*c^3) - (2*b*e*x)/(3*c^3) - (b*(2*d - e)*x^3)/(24*c) +
(b*e*x^3)/(18*c) - (b*(2*d - 3*e)*ArcTan[c*x])/(8*c^4) + (2*b*e*ArcTan[c*x]
)/(3*c^4) + (e*x^2*(a + b*ArcTan[c*x]))/(4*c^2) - (e*x^4*(a + b*ArcTan[c*x]
))/8 + (b*e*x*Log[1 + c^2*x^2])/(4*c^3) - (b*e*x^3*Log[1 + c^2*x^2])/(12*c)
 - (e*(a + b*ArcTan[c*x])*Log[1 + c^2*x^2])/(4*c^4) + (x^4*(a + b*ArcTan[c*
x])*(d + e*Log[1 + c^2*x^2]))/4
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 302

```
Int[(x_)^(m_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Int[PolynomialDivide[x
^m, a + b*x^n, x], x] /; FreeQ[{a, b}, x] && IGtQ[m, 0] && IGtQ[n, 0] && Gt
Q[m, 2*n - 1]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 459

```
Int[((e_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n
_)), x_Symbol] :> Simp[(d*(e*x)^(m + 1)*(a + b*x^n)^(p + 1))/(b*e*(m + n*(p
 + 1) + 1)), x] - Dist[(a*d*(m + 1) - b*c*(m + n*(p + 1) + 1))/(b*(m + n*(p
 + 1) + 1)), Int[(e*x)^m*(a + b*x^n)^p, x], x] /; FreeQ[{a, b, c, d, e, m,
n, p}, x] && NeQ[b*c - a*d, 0] && NeQ[m + n*(p + 1) + 1, 0]
```

Rule 2395

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))*((f_.) + (g_.)*(x_
))^(q_.), x_Symbol] :> Simp[((f + g*x)^(q + 1)*(a + b*Log[c*(d + e*x)^n]))/
(g*(q + 1)), x] - Dist[(b*e*n)/(g*(q + 1)), Int[(f + g*x)^(q + 1)/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, q}, x] && NeQ[e*f - d*g, 0] && N
eQ[q, -1]
```

Rule 2448

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)], x_Symbol] :> Simp[x*Log[c*(d
 + e*x^n)^p], x] - Dist[e*n*p, Int[x^n/(d + e*x^n), x], x] /; FreeQ[{c, d,
e, n, p}, x]
```

Rule 2454

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*Lo
g[c*(d + e*x)^p])^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, m, n, p, q},
x] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0] || IGtQ[q, 0]) &&
  !(EqQ[q, 1] && ILtQ[n, 0] && IGtQ[m, 0])
```

Rule 2455

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))*((f_.)*(x_))^
(m_.), x_Symbol] :> Simp[((f*x)^(m + 1)*(a + b*Log[c*(d + e*x^n)^p]))/(f*(m
 + 1)), x] - Dist[(b*e*n*p)/(f*(m + 1)), Int[(x^(n - 1)*(f*x)^(m + 1))/(d +
 e*x^n), x], x] /; FreeQ[{a, b, c, d, e, f, m, n, p}, x] && NeQ[m, -1]
```

Rule 2471

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*((f_) +
 (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> With[{t = ExpandIntegrand[(a + b*Log[
c*(d + e*x^n)^p])^q, (f + g*x^s)^r, x]}, Int[t, x] /; SumQ[t]] /; FreeQ[{a,
 b, c, d, e, f, g, n, p, q, r, s}, x] && IntegerQ[n] && IGtQ[q, 0] && Integ
erQ[r] && IntegerQ[s] && (EqQ[q, 1] || (GtQ[r, 0] && GtQ[s, 1]) || (LtQ[s,
0] && LtQ[r, 0]))
```

Rule 5019

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*Log[f + g*x^2])
, x]}, Dist[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[ExpandIntegrand[u/(1 +
 c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGtQ[(m + 1)/2
, 0]
```

Rubi steps

$$\int x^3 \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)dx = \frac{ex^2\left(a+b\tan^{-1}(cx)\right)}{4c^2} - \frac{1}{8}ex^4\left(a+b\tan^{-1}(cx)\right) - \frac{e\left(a+b\,\mathrm{ta}\right.}{}$$

$$= \frac{ex^2\left(a+b\tan^{-1}(cx)\right)}{4c^2} - \frac{1}{8}ex^4\left(a+b\tan^{-1}(cx)\right) - \frac{e\left(a+b\,\mathrm{ta}\right.}{}$$

$$= -\frac{b(2d-e)x^3}{24c} + \frac{ex^2\left(a+b\tan^{-1}(cx)\right)}{4c^2} - \frac{1}{8}ex^4\left(a+b\tan^{-1}(c\right.$$

$$= \frac{b(2d-3e)x}{8c^3} - \frac{b(2d-e)x^3}{24c} + \frac{ex^2\left(a+b\tan^{-1}(cx)\right)}{4c^2} - \frac{1}{8}ex^4\left(\right.$$

$$= \frac{b(2d-3e)x}{8c^3} - \frac{b(2d-e)x^3}{24c} - \frac{b(2d-3e)\tan^{-1}(cx)}{8c^4} + \frac{ex^2\left(a\right.}{}$$

$$= \frac{b(2d-3e)x}{8c^3} - \frac{bex}{2c^3} - \frac{b(2d-e)x^3}{24c} - \frac{b(2d-3e)\tan^{-1}(cx)}{8c^4} +$$

$$= \frac{b(2d-3e)x}{8c^3} - \frac{2bex}{3c^3} - \frac{b(2d-e)x^3}{24c} + \frac{bex^3}{18c} - \frac{b(2d-3e)\tan^{}}{8c^4}$$

$$= \frac{b(2d-3e)x}{8c^3} - \frac{2bex}{3c^3} - \frac{b(2d-e)x^3}{24c} + \frac{bex^3}{18c} - \frac{b(2d-3e)\tan^{}}{8c^4}$$

Mathematica [A] time = 0.18, size = 164, normalized size = 0.74

$$\frac{-6e\log\left(c^2x^2+1\right)\left(a\left(3-3c^4x^4\right)+bcx\left(c^2x^2-3\right)\right)+cx\left(18ac^3dx^3-9acex\left(c^2x^2-2\right)-6bd\left(c^2x^2-3\right)+be\left(7c\right.\right.}{72c^4}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^3*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] (c*x*(18*a*c^3*d*x^3 - 6*b*d*(-3 + c^2*x^2) - 9*a*c*e*x*(-2 + c^2*x^2) + b*
e*(-75 + 7*c^2*x^2)) - 6*e*(b*c*x*(-3 + c^2*x^2) + a*(3 - 3*c^4*x^4))*Log[1
 + c^2*x^2] + 3*b*ArcTan[c*x]*(e*(25 + 6*c^2*x^2 - 3*c^4*x^4) + 6*d*(-1 + c
^4*x^4) + 6*e*(-1 + c^4*x^4)*Log[1 + c^2*x^2]))/(72*c^4)
```

fricas [A] time = 0.48, size = 178, normalized size = 0.81

$$\frac{18\,ac^2ex^2+9\left(2\,ac^4d-ac^4e\right)x^4-\left(6\,bc^3d-7\,bc^3e\right)x^3+3\left(6\,bcd-25\,bce\right)x+3\left(6\,bc^2ex^2+3\left(2\,bc^4d-bc^4e\right)x^4\right.}{72}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="fricas")
```

```
[Out] 1/72*(18*a*c^2*e*x^2 + 9*(2*a*c^4*d - a*c^4*e)*x^4 - (6*b*c^3*d - 7*b*c^3*e
)*x^3 + 3*(6*b*c*d - 25*b*c*e)*x + 3*(6*b*c^2*e*x^2 + 3*(2*b*c^4*d - b*c^4*
e)*x^4 - 6*b*d + 25*b*e)*arctan(c*x) + 6*(3*a*c^4*e*x^4 - b*c^3*e*x^3 + 3*b
*c*e*x - 3*a*e + 3*(b*c^4*e*x^4 - b*e)*arctan(c*x))*log(c^2*x^2 + 1))/c^4
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="giac")
```

[Out] sage0*x

maple [C] time = 4.05, size = 3897, normalized size = 17.63

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1)),x)
```

```
[Out] -1/2/c^4*b*arctan(c*x)*ln(2)*e+1/2/c^4*b*e*arctan(c*x)*ln((1+I*c*x)^2/(c^2*
x^2+1)+1)+1/2*b*ln(2)*arctan(c*x)*x^4*e-1/2*b*arctan(c*x)*ln((1+I*c*x)^2/(c
^2*x^2+1)+1)*x^4*e-25/24*b*e*x/c^3+41/24*b*e*arctan(c*x)/c^4+1/4*b*d*x/c^3-
1/12*b*d*x^3/c-1/4*b*d*arctan(c*x)/c^4+1/24*I/c*b*csgn(I*(1+I*c*x)/(c^2*x^2
+1)^(1/2))^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*Pi*x^3*e-1/12*I/c*b*csgn(I*(1+
I*c*x)/(c^2*x^2+1)^(1/2))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*Pi*x^3*e-1/24*I
/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c
*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^3*e-1/24*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1
)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi
*x^3*e+1/12*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*((1+I*c*x)
^2/(c^2*x^2+1)+1))*Pi*x^3*e-1/24*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2
)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*Pi*x^3*e-1/4*I*b*arctan(c*x)*csgn(I
*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*x^
4*e+1/8*I*b*arctan(c*x)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*((1+I*
c*x)^2/(c^2*x^2+1)+1))^2*Pi*x^4*e-1/8*I/c^3*b*csgn(I*(1+I*c*x)/(c^2*x^2+1)^
(1/2))^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*Pi*x*e+1/4*I/c^3*b*csgn(I*(1+I*c*x
)/(c^2*x^2+1)^(1/2))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*Pi*x*e+1/8*I/c^3*b*c
sgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/
(c^2*x^2+1)+1)^2)^2*Pi*x*e+1/8*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I
*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x*e-1/
4*I/c^3*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*((1+I*c*x)^2/(c^2*
x^2+1)+1))*Pi*x*e+1/8*I/c^3*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*
((1+I*c*x)^2/(c^2*x^2+1)+1))^2*Pi*x*e+1/8*I/c^4*b*csgn(I*(1+I*c*x)^2/(c^2*x
^2+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*Pi*e*arctan(c*x)-1/4*I/c^4*b*c
sgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*Pi*e*a
rctan(c*x)-1/8*I/c^4*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2
+1)+1)^2)^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*Pi*e*arctan(c*x)-1/8*I/c^4*b*Pi
*e*arctan(c*x)*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^
2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2+1/4*I/c^4*b*csgn(I*((1+I*c*x)^2/(
c^2*x^2+1)+1)^2)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*e*arctan(c*x)-1/8
*I/c^4*b*Pi*e*arctan(c*x)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+
I*c*x)^2/(c^2*x^2+1)+1)^2)-1/8*I*b*arctan(c*x)*csgn(I*(1+I*c*x)/(c^2*x^2+1)
^(1/2))^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*Pi*x^4*e+1/4*I*b*arctan(c*x)*csgn
(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*Pi*x^4*e+
1/8*I*b*arctan(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2
*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^4*e+1/8*I*b*arctan(c*x)*csgn(
I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c*x
)^2/(c^2*x^2+1)+1)^2)*Pi*x^4*e+1/4*a*e/c^2*x^2-1/4*a*e/c^4*ln(c^2*x^2+1)+1/
4*x^4*a*e*ln(c^2*x^2+1)+1/4*b*arctan(c*x)*x^4*d+1/4*x^4*a*d+1/6/c^4*b*e*Pi*
csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))-1/3/c
^4*b*e*Pi*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1
))^2-1/6/c^4*b*e*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2
*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2-1/6/c^4*b*e*Pi*csgn(I/((1+I*c*x)^2
/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+
1)^2)^2+1/3/c^4*b*e*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x
)^2/(c^2*x^2+1)+1)^2)^2-1/6/c^4*b*e*Pi*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^
2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)+1/6/c^4*b*e*(3*arctan(c*x)*x^3*c^3-
c^2*x^2-3*I*arctan(c*x)*x^2*c^2+I*c*x-3*arctan(c*x)*x*c+4+3*I*arctan(c*x))*
(I+c*x)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))-1/6/c*b*ln(2)*x^3*e+1/6/c*b*ln((1+I
*c*x)^2/(c^2*x^2+1)+1)*x^3*e+1/4/c^2*b*arctan(c*x)*x^2*e+1/6/c^4*b*e*Pi*csg
n(I*(1+I*c*x)^2/(c^2*x^2+1))^3+1/6/c^4*b*e*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1
```

```
)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3-1/6/c^4*b*e*Pi*csgn(I*((1+I*c*x)^2/(c^2*
x^2+1)+1)^2)^3+1/2/c^3*b*ln(2)*x*e-1/2/c^3*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*
x*e+2/3*I/c^4*b*e*ln(2)+1/24*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*x^3
*e+1/24*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)
^3*Pi*x^3*e-1/24*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^3*e-1/8
*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*x*e-1/8*I/c^3*b*csgn(I*(1+I*c
*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x*e+1/8*I/c^3*b*csgn(
I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x*e+1/8*I/c^4*b*Pi*e*arctan(c*x)*csgn
(I*(1+I*c*x)^2/(c^2*x^2+1))^3+1/8*I/c^4*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((
1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*e*arctan(c*x)-1/8*I/c^4*b*Pi*e*arctan(c*x
)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3+1/6/c^4*b*e*Pi*csgn(I/((1+I*c*x)^
2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2
*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)-1/8*I*b*arctan(c*x)*csgn(I*(1+I*c*x)
^2/(c^2*x^2+1))^3*Pi*x^4*e-1/8*I*b*arctan(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+
1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^4*e+1/8*I*b*arctan(c*x)*csgn(I*((1
+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^4*e+1/24*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x
^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I
/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^3*e-1/8*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^
2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csg
n(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x*e+1/8*I/c^4*b*Pi*e*arctan(c*x)*csgn
(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1
+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)-1/8*I*b*arctan(c*x)*cs
gn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(
c^2*x^2+1)+1)^2)*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^4*e+7/72*b*e*x^
3/c-1/8*a*e*x^4+1/3*I/c^4*b*d-41/36*I/c^4*b*e-1/8*b*arctan(c*x)*e*x^4
```

maxima [A] time = 0.42, size = 224, normalized size = 1.01

$$\frac{1}{4}adx^4+\frac{1}{72}bce\left(\frac{7c^2x^3-6\left(c^2x^3-3x\right)\log\left(c^2x^2+1\right)-75x}{c^4}+\frac{75\arctan(cx)}{c^5}\right)+\frac{1}{8}\left(2x^4\log\left(c^2x^2+1\right)-c^2\left(\frac{c^2}{}\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^3*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="maxima")
```

```
[Out] 1/4*a*d*x^4 + 1/72*b*c*e*((7*c^2*x^3 - 6*(c^2*x^3 - 3*x)*log(c^2*x^2 + 1) -
 75*x)/c^4 + 75*arctan(c*x)/c^5) + 1/8*(2*x^4*log(c^2*x^2 + 1) - c^2*((c^2*
x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*b*e*arctan(c*x) + 1/12*(3*x^4*a
rctan(c*x) - c*((c^2*x^3 - 3*x)/c^4 + 3*arctan(c*x)/c^5))*b*d + 1/8*(2*x^4*
log(c^2*x^2 + 1) - c^2*((c^2*x^4 - 2*x^2)/c^4 + 2*log(c^2*x^2 + 1)/c^6))*a*
e
```

mupad [B] time = 1.78, size = 297, normalized size = 1.34

$$\frac{a\,d\,x^4}{4}-\frac{a\,e\,x^4}{8}+\frac{b\,d\,x}{4\,c^3}-\frac{25\,b\,e\,x}{24\,c^3}+\frac{b\,d\,x^4\,\mathrm{atan}\left(c\,x\right)}{4}-\frac{b\,e\,x^4\,\mathrm{atan}\left(c\,x\right)}{8}-\frac{a\,e\,\ln\left(c^2\,x^2+1\right)}{4\,c^4}+\frac{a\,e\,x^2}{4\,c^2}-\frac{b\,d\,x^3}{12\,c}-\frac{b\,d\,\mathrm{atan}\left(\frac{}{6}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^3*(a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)),x)
```

```
[Out] (a*d*x^4)/4 - (a*e*x^4)/8 + (b*d*x)/(4*c^3) - (25*b*e*x)/(24*c^3) + (b*d*x^
4*atan(c*x))/4 - (b*e*x^4*atan(c*x))/8 - (a*e*log(c^2*x^2 + 1))/(4*c^4) + (
a*e*x^2)/(4*c^2) - (b*d*x^3)/(12*c) - (b*d*atan((6*b*c*d*x)/(6*b*d - 25*b*e
) - (25*b*c*e*x)/(6*b*d - 25*b*e)))/(4*c^4) + (7*b*e*x^3)/(72*c) + (25*b*e*
atan((6*b*c*d*x)/(6*b*d - 25*b*e) - (25*b*c*e*x)/(6*b*d - 25*b*e)))/(24*c^4
) + (a*e*x^4*log(c^2*x^2 + 1))/4 + (b*e*x*log(c^2*x^2 + 1))/(4*c^3) - (b*e*
atan(c*x)*log(c^2*x^2 + 1))/(4*c^4) + (b*e*x^2*atan(c*x))/(4*c^2) + (b*e*x^
4*atan(c*x)*log(c^2*x^2 + 1))/4 - (b*e*x^3*log(c^2*x^2 + 1))/(12*c)
```

sympy [A] time = 8.52, size = 279, normalized size = 1.26

$$\begin{cases} \frac{adx^4}{4} + \frac{aex^4\log\left(c^2x^2+1\right)}{4} - \frac{aex^4}{8} + \frac{aex^2}{4c^2} - \frac{ae\log\left(c^2x^2+1\right)}{4c^4} + \frac{bdx^4\operatorname{atan}(cx)}{4} + \frac{bex^4\log\left(c^2x^2+1\right)\operatorname{atan}(cx)}{4} - \frac{bex^4\operatorname{atan}(cx)}{8} - \frac{bdx^3}{12c} - \frac{bex^3 \\ \frac{adx^4}{4} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**3*(a+b*atan(c*x))*(d+e*ln(c**2*x**2+1)),x)
```

```
[Out] Piecewise((a*d*x**4/4 + a*e*x**4*log(c**2*x**2 + 1)/4 - a*e*x**4/8 + a*e*x*
*2/(4*c**2) - a*e*log(c**2*x**2 + 1)/(4*c**4) + b*d*x**4*atan(c*x)/4 + b*e*
x**4*log(c**2*x**2 + 1)*atan(c*x)/4 - b*e*x**4*atan(c*x)/8 - b*d*x**3/(12*c
) - b*e*x**3*log(c**2*x**2 + 1)/(12*c) + 7*b*e*x**3/(72*c) + b*e*x**2*atan(
c*x)/(4*c**2) + b*d*x/(4*c**3) + b*e*x*log(c**2*x**2 + 1)/(4*c**3) - 25*b*e
*x/(24*c**3) - b*d*atan(c*x)/(4*c**4) - b*e*log(c**2*x**2 + 1)*atan(c*x)/(4
*c**4) + 25*b*e*atan(c*x)/(24*c**4), Ne(c, 0)), (a*d*x**4/4, True))
```

3.1288 $\int x^2 \left(a + b \tan^{-1}(cx)\right) \left(d + e \log \left(1 + c^2 x^2\right)\right) dx$

Optimal. Leaf size=213

$$\frac{1}{3}x^3 \left(a + b \tan^{-1}(cx)\right) \left(e \log \left(c^2 x^2 + 1\right) + d\right) - \frac{2ae \tan^{-1}(cx)}{3c^3} + \frac{2aex}{3c^2} - \frac{2}{9}aex^3 - \frac{be \tan^{-1}(cx)^2}{3c^3} - \frac{bx^2 \left(e \log \left(c^2 x^2 + 1\right)\right.}{6c}$$

```
[Out] 2/3*a*e*x/c^2+5/18*b*e*x^2/c-2/9*a*e*x^3-2/3*a*e*arctan(c*x)/c^3+2/3*b*e*x*
arctan(c*x)/c^2-2/9*b*e*x^3*arctan(c*x)-1/3*b*e*arctan(c*x)^2/c^3-11/18*b*e
*ln(c^2*x^2+1)/c^3-1/12*b*e*ln(c^2*x^2+1)^2/c^3-1/6*b*x^2*(d+e*ln(c^2*x^2+1
))/c+1/3*x^3*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))+1/6*b*ln(c^2*x^2+1)*(d+e
*ln(c^2*x^2+1))/c^3
```

Rubi [A] time = 0.57, antiderivative size = 213, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 15, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}} = 0.577$, Rules used = {4852, 266, 43, 5021, 6725, 801, 635, 203, 260, 4916, 4846, 4884, 2475, 2390, 2301}

$$\frac{1}{3}x^3 \left(a + b \tan^{-1}(cx)\right) \left(e \log \left(c^2 x^2 + 1\right) + d\right) + \frac{2aex}{3c^2} - \frac{2ae \tan^{-1}(cx)}{3c^3} - \frac{2}{9}aex^3 - \frac{bx^2 \left(e \log \left(c^2 x^2 + 1\right) + d\right)}{6c} + \frac{b \log \left(c\right.}{}$$

Antiderivative was successfully verified.

```
[In] Int[x^2*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] (2*a*e*x)/(3*c^2) + (5*b*e*x^2)/(18*c) - (2*a*e*x^3)/9 - (2*a*e*ArcTan[c*x]
)/(3*c^3) + (2*b*e*x*ArcTan[c*x])/(3*c^2) - (2*b*e*x^3*ArcTan[c*x])/9 - (b*
e*ArcTan[c*x]^2)/(3*c^3) - (11*b*e*Log[1 + c^2*x^2])/(18*c^3) - (b*e*Log[1
+ c^2*x^2]^2)/(12*c^3) - (b*x^2*(d + e*Log[1 + c^2*x^2]))/(6*c) + (x^3*(a +
 b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/3 + (b*Log[1 + c^2*x^2]*(d + e*Lo
g[1 + c^2*x^2]))/(6*c^3)
```

Rule 43

```
Int[((a_.) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int
[ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d, n},
x] && NeQ[b*c - a*d, 0] && IGtQ[m, 0] && ( !IntegerQ[n] || (EqQ[c, 0] && Le
Q[7*m + 4*n + 4, 0]) || LtQ[9*m + 5*(n + 1), 0] || GtQ[m + n + 2, 0])
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
```

```
}, x] && !NiceSqrtQ[-(a*c)]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int x^2 \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)dx = -\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{6c}+\frac{1}{3}x^3\left(a+b\tan^{-1}(cx)\right)\left(d+e\,\mathrm{l}\right.$$

$$= -\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{6c}+\frac{1}{3}x^3\left(a+b\tan^{-1}(cx)\right)\left(d+e\,\mathrm{l}\right.$$

$$= -\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{6c}+\frac{1}{3}x^3\left(a+b\tan^{-1}(cx)\right)\left(d+e\,\mathrm{l}\right.$$

$$= -\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{6c}+\frac{1}{3}x^3\left(a+b\tan^{-1}(cx)\right)\left(d+e\,\mathrm{l}\right.$$

$$= -\frac{be\log^2\left(1+c^2x^2\right)}{12c^3}-\frac{bx^2\left(d+e\log\left(1+c^2x^2\right)\right)}{6c}+\frac{1}{3}x^3\left(a+\right.$$

$$= \frac{2aex}{3c^2}+\frac{bex^2}{6c}-\frac{2}{9}aex^3-\frac{2}{9}bex^3\tan^{-1}(cx)-\frac{be\log^2\left(1+c^2x\right.}{12c^3}$$

$$= \frac{2aex}{3c^2}+\frac{bex^2}{6c}-\frac{2}{9}aex^3+\frac{2bex\tan^{-1}(cx)}{3c^2}-\frac{2}{9}bex^3\tan^{-1}(cx)$$

$$= \frac{2aex}{3c^2}+\frac{bex^2}{6c}-\frac{2}{9}aex^3-\frac{2ae\tan^{-1}(cx)}{3c^3}+\frac{2bex\tan^{-1}(cx)}{3c^2}-$$

$$= \frac{2aex}{3c^2}+\frac{5bex^2}{18c}-\frac{2}{9}aex^3-\frac{2ae\tan^{-1}(cx)}{3c^3}+\frac{2bex\tan^{-1}(cx)}{3c^2}-$$

Mathematica [A] time = 0.14, size = 171, normalized size = 0.80

$$\frac{2cx\left(6ac^2dx^2-4ae\left(c^2x^2-3\right)+bcx(5e-3d)\right)+2\log\left(c^2x^2+1\right)\left(6ac^3ex^3-be\left(3c^2x^2+11\right)+3bd\right)-4\tan^{-1}(}{36c^3}$$

Antiderivative was successfully verified.

```
[In] Integrate[x^2*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] (2*c*x*(b*c*(-3*d + 5*e)*x + 6*a*c^2*d*x^2 - 4*a*e*(-3 + c^2*x^2)) - 12*b*e
*ArcTan[c*x]^2 + 2*(3*b*d + 6*a*c^3*e*x^3 - b*e*(11 + 3*c^2*x^2))*Log[1 + c
^2*x^2] + 3*b*e*Log[1 + c^2*x^2]^2 - 4*ArcTan[c*x]*(6*a*e + b*c*x*(-6*e - 3
*c^2*d*x^2 + 2*c^2*e*x^2) - 3*b*c^3*e*x^3*Log[1 + c^2*x^2]))/(36*c^3)
```

fricas [A] time = 0.46, size = 169, normalized size = 0.79

$$24\,acex+4\left(3\,ac^3d-2\,ac^3e\right)x^3-12\,be\arctan(cx)^2+3\,be\log\left(c^2x^2+1\right)^2-2\left(3\,bc^2d-5\,bc^2e\right)x^2+4\left(6\,bcex+\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="fricas")
```

```
[Out] 1/36*(24*a*c*e*x + 4*(3*a*c^3*d - 2*a*c^3*e)*x^3 - 12*b*e*arctan(c*x)^2 + 3
*b*e*log(c^2*x^2 + 1)^2 - 2*(3*b*c^2*d - 5*b*c^2*e)*x^2 + 4*(6*b*c*e*x + (3
*b*c^3*d - 2*b*c^3*e)*x^3 - 6*a*e)*arctan(c*x) + 2*(6*b*c^3*e*x^3*arctan(c*
x) + 6*a*c^3*e*x^3 - 3*b*c^2*e*x^2 + 3*b*d - 11*b*e)*log(c^2*x^2 + 1))/c^3
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 2.80, size = 4145, normalized size = 19.46

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1)),x)
```

```
[Out] 5/18*e/c^3*b-2/9*a*e*x^3-1/6*b*d*x^2/c+1/3/c^3*b*e*ln((1+I*c*x)^2/(c^2*x^2+
1)+1)^2+1/3*b*arctan(c*x)*x^3*d-1/3/c^3*b*d*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1
1/9/c^3*b*e*ln((1+I*c*x)^2/(c^2*x^2+1)+1)+1/3*x^3*a*d+2/3*b*e*x*arctan(c*x)
/c^2+1/12*I/c*b*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c
^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi
*x^2*e+1/6*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+
1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)
*e*Pi*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/6*I*b*arctan(c*x)*csgn(I/((1+I*c*x)^2
/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*
x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^3*e+2/3*a*e*x/c^2-2/3*a*e*arctan
(c*x)/c^3-2/9*b*e*x^3*arctan(c*x)-1/3/c*b*ln(2)*x^2*e-2/3/c^3*b*e*ln(2)*ln(
(1+I*c*x)^2/(c^2*x^2+1)+1)-2/3*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*arctan(c*x)*
x^3*e+2/3*b*ln(2)*arctan(c*x)*x^3*e+1/3*I/c^3*b*d*arctan(c*x)-8/9*I/c^3*b*e
*arctan(c*x)+1/3*x^3*a*e*ln(c^2*x^2+1)+1/3*I/c^3*b*csgn(I*((1+I*c*x)^2/(c^2
*x^2+1)+1)^2)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*e*Pi*ln((1+I*c*x)^2/(c^
2*x^2+1)+1)+1/12*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x
^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)
+1)^2)*Pi*e+1/6*I*b*arctan(c*x)*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(
I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^3*e+1/3*I*b
*arctan(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)
^(1/2))*Pi*x^3*e+1/6*I*b*arctan(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I
*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^3*e-1/6*I*b*
arctan(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1
/2))^2*Pi*x^3*e+1/6*I*b*arctan(c*x)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*c
sgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^3*e-1/3*I*b*arctan(c*x)*csgn(I*((
1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^3*e
+1/6/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*cs
gn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*e*ar
ctan(c*x)-1/12*I/c*b*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)
^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^2*e-1/6*I/c*b*csgn(I*(
1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*Pi*x^2*e-1/12
*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I
*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x^2*e+1/12*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2
+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*Pi*x^2*e-1/12*I/c*b*csgn(I*((1+I
*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x^2*e+1/
```

```
6*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)
+1)^2)^2*Pi*x^2*e-1/6*I/c^3*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*e*Pi*csgn(I/((1
+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^
2*x^2+1)+1)^2)^2-1/3*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*
c*x)/(c^2*x^2+1)^(1/2))*e*Pi*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/6*I/c^3*b*csgn
(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*(1+I*c*x
)^2/(c^2*x^2+1))*e*Pi*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/6/c^3*b*d+1/6*I/c^3*b
*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*e*Pi
*ln((1+I*c*x)^2/(c^2*x^2+1)+1)-1/6*I/c^3*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+
1)^2)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*e*Pi*ln((1+I*c*x)^2/(c^2*x^2+1)
+1)+1/3/c*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*x^2*e-1/6/c^3*b*csgn(I*(1+I*c*x)^
2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c*x)^2/(c^2*x^2
+1)+1)^2)*Pi*e*arctan(c*x)-1/3/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn
(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*Pi*e*arctan(c*x)-1/6/c^3*b*csgn(I*(1+I*c*x)
^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*(1+I*c*x)^2/(c^2*x^2
+1))*Pi*e*arctan(c*x)+1/6/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I
*c*x)/(c^2*x^2+1)^(1/2))^2*Pi*e*arctan(c*x)-1/6/c^3*b*Pi*e*arctan(c*x)*csgn
(I*((1+I*c*x)^2/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)+1/3
/c^3*b*Pi*e*arctan(c*x)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*
x)^2/(c^2*x^2+1)+1)^2)^2+1/12*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(
I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*Pi*e-1/12*I/c^3*b*Pi*e*csgn(I*((1+I*c*x)^2
/(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)+1/6*I/c^3*b*csgn(I
*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*e-
1/6*I*b*arctan(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*x^3*e-1/6*I*b*arct
an(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*
x^3*e+1/6*I*b*arctan(c*x)*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^3*e+
1/12*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*x^2*e+1/12*I/c*b*csgn(I*(1+
I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^2*e-1/12*I/c*b*c
sgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x^2*e+1/6*I/c^3*b*ln((1+I*c*x)^2/
(c^2*x^2+1)+1)*e*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3+1/6*I/c^3*b*ln((1+I*c
*x)^2/(c^2*x^2+1)+1)*e*Pi*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*
x^2+1)+1)^2)^3-1/6*I/c^3*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*e*Pi*csgn(I*((1+I*
c*x)^2/(c^2*x^2+1)+1)^2)^3-1/12*I/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+
I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*e-1/6
*I/c^3*b*Pi*e*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*csgn(I*(1+I*c*x)^2/(c^2*x
^2+1))^2-1/12*I/c^3*b*Pi*e*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)
^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2+5/18*b*e*x^2/c-1/3/c^3*b*ln
(2)*e+1/6/c^3*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*e*arctan(c*x)+1/6/c^3*
b*Pi*e*arctan(c*x)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+
1)^2)^3-1/6/c^3*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*e*arctan(c*x)+
1/12*I/c^3*b*Pi*e*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3+1/12*I/c^3*b*Pi*e*csgn(
I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3-1/12*I/c^3*b*Pi*
e*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3+2/3*I/c^3*b*ln(2)*e*arctan(c*x)-1
/3/c^3*b*e*(-2*arctan(c*x)*x^3*c^3+c^2*x^2-2*I*arctan(c*x)+2*ln((1+I*c*x)^2
/(c^2*x^2+1)+1)+1)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))
```

maxima [A] time = 0.43, size = 212, normalized size = 1.00

$$\frac{1}{3}adx^3+\frac{1}{9}\left(3x^3\log\left(c^2x^2+1\right)-2c^2\left(\frac{c^2x^3-3x}{c^4}+\frac{3\arctan(cx)}{c^5}\right)\right)be\arctan(cx)+\frac{1}{6}\left(2x^3\arctan(cx)-c\left(\frac{x^2}{c^2}-\right.\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x^2*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="maxima")
```

```
[Out] 1/3*a*d*x^3 + 1/9*(3*x^3*log(c^2*x^2 + 1) - 2*c^2*((c^2*x^3 - 3*x)/c^4 + 3*
arctan(c*x)/c^5))*b*e*arctan(c*x) + 1/6*(2*x^3*arctan(c*x) - c*(x^2/c^2 - l
og(c^2*x^2 + 1)/c^4))*b*d + 1/9*(3*x^3*log(c^2*x^2 + 1) - 2*c^2*((c^2*x^3 -
 3*x)/c^4 + 3*arctan(c*x)/c^5))*a*e + 1/36*(10*c^2*x^2 + 12*arctan(c*x)^2 -
 2*(3*c^2*x^2 + 11)*log(c^2*x^2 + 1) + 3*log(c^2*x^2 + 1)^2)*b*e/c^3
```

mupad [B] time = 2.53, size = 212, normalized size = 1.00

$$\frac{a\,d\,x^3}{3}-\frac{2\,a\,e\,x^3}{9}+\frac{b\,e\ln\left(c^2\,x^2+1\right)^2}{12\,c^3}+\frac{2\,a\,e\,x}{3\,c^2}-\frac{2\,a\,e\,\mathrm{atan}\left(c\,x\right)}{3\,c^3}+\frac{b\,d\,x^3\,\mathrm{atan}\left(c\,x\right)}{3}-\frac{2\,b\,e\,x^3\,\mathrm{atan}\left(c\,x\right)}{9}+\frac{b\,d\,\ln\left(c^2\,x^2+1\right.}{6\,c^3}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x^2*(a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)),x)
```

```
[Out] (a*d*x^3)/3 - (2*a*e*x^3)/9 + (b*e*log(c^2*x^2 + 1)^2)/(12*c^3) + (2*a*e*x)
/(3*c^2) - (2*a*e*atan(c*x))/(3*c^3) + (b*d*x^3*atan(c*x))/3 - (2*b*e*x^3*a
tan(c*x))/9 + (b*d*log(c^2*x^2 + 1))/(6*c^3) - (11*b*e*log(c^2*x^2 + 1))/(1
8*c^3) - (b*d*x^2)/(6*c) + (5*b*e*x^2)/(18*c) + (a*e*x^3*log(c^2*x^2 + 1))/
3 - (b*e*atan(c*x)^2)/(3*c^3) + (b*e*x^3*atan(c*x)*log(c^2*x^2 + 1))/3 - (b
*e*x^2*log(c^2*x^2 + 1))/(6*c) + (2*b*e*x*atan(c*x))/(3*c^2)
```

sympy [A] time = 5.70, size = 258, normalized size = 1.21

$$\begin{cases} \frac{adx^3}{3}+\frac{aex^3\log\left(c^2x^2+1\right)}{3}-\frac{2aex^3}{9}+\frac{2aex}{3c^2}-\frac{2ae\,\mathrm{atan}\,(cx)}{3c^3}+\frac{bdx^3\,\mathrm{atan}\,(cx)}{3}+\frac{bex^3\log\left(c^2x^2+1\right)\mathrm{atan}\,(cx)}{3}-\frac{2bex^3\,\mathrm{atan}\,(cx)}{9}-\frac{bdx^2}{6c}-\frac{bex^2}{} \\ \frac{adx^3}{3} \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x**2*(a+b*atan(c*x))*(d+e*ln(c**2*x**2+1)),x)
```

```
[Out] Piecewise((a*d*x**3/3 + a*e*x**3*log(c**2*x**2 + 1)/3 - 2*a*e*x**3/9 + 2*a*
e*x/(3*c**2) - 2*a*e*atan(c*x)/(3*c**3) + b*d*x**3*atan(c*x)/3 + b*e*x**3*l
og(c**2*x**2 + 1)*atan(c*x)/3 - 2*b*e*x**3*atan(c*x)/9 - b*d*x**2/(6*c) - b
*e*x**2*log(c**2*x**2 + 1)/(6*c) + 5*b*e*x**2/(18*c) + 2*b*e*x*atan(c*x)/(3
*c**2) + b*d*log(c**2*x**2 + 1)/(6*c**3) + b*e*log(c**2*x**2 + 1)**2/(12*c*
*3) - 11*b*e*log(c**2*x**2 + 1)/(18*c**3) - b*e*atan(c*x)**2/(3*c**3), Ne(c
, 0)), (a*d*x**3/3, True))
```

3.1289 $\int x \left(a + b \tan^{-1}(cx)\right) \left(d + e \log\left(1 + c^2x^2\right)\right) dx$

Optimal. Leaf size=137

$$\frac{e\left(c^2x^2+1\right)\log\left(c^2x^2+1\right)\left(a+b\tan^{-1}(cx)\right)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{b(d-e)\tan^{-1}(c}{2c^2}$$

```
[Out] -1/2*b*(d-e)*x/c+b*e*x/c+1/2*b*(d-e)*arctan(c*x)/c^2-b*e*arctan(c*x)/c^2+1/
2*d*x^2*(a+b*arctan(c*x))-1/2*e*x^2*(a+b*arctan(c*x))-1/2*b*e*x*ln(c^2*x^2+
1)/c+1/2*e*(c^2*x^2+1)*(a+b*arctan(c*x))*ln(c^2*x^2+1)/c^2
```

Rubi [A] time = 0.11, antiderivative size = 137, normalized size of antiderivative = 1.00, number of steps used = 7, number of rules used = 7, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.292, Rules used = {2454, 2389, 2295, 5019, 321, 203, 2448}

$$\frac{e\left(c^2x^2+1\right)\log\left(c^2x^2+1\right)\left(a+b\tan^{-1}(cx)\right)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{b(d-e)\tan^{-1}(c}{2c^2}$$

Antiderivative was successfully verified.

```
[In] Int[x*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] -(b*(d - e)*x)/(2*c) + (b*e*x)/c + (b*(d - e)*ArcTan[c*x])/(2*c^2) - (b*e*A
rcTan[c*x])/c^2 + (d*x^2*(a + b*ArcTan[c*x]))/2 - (e*x^2*(a + b*ArcTan[c*x]
))/2 - (b*e*x*Log[1 + c^2*x^2])/(2*c) + (e*(1 + c^2*x^2)*(a + b*ArcTan[c*x]
)*Log[1 + c^2*x^2])/(2*c^2)
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2389

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.), x_Symbol] :
> Dist[1/e, Subst[Int[(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a
, b, c, d, e, n, p}, x]
```

Rule 2448

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)], x_Symbol] :> Simp[x*Log[c*(d
 + e*x^n)^p], x] - Dist[e*n*p, Int[x^n/(d + e*x^n), x], x] /; FreeQ[{c, d,
e, n, p}, x]
```

Rule 2454

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*Lo
g[c*(d + e*x)^p])^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, m, n, p, q},
x] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0] || IGtQ[q, 0]) &&
  !(EqQ[q, 1] && ILtQ[n, 0] && IGtQ[m, 0])
```

Rule 5019

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*Log[f + g*x^2])
, x]}, Dist[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[ExpandIntegrand[u/(1 +
 c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGtQ[(m + 1)/2
, 0]
```

Rubi steps

$$\int x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)dx=\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{e\left(1+c^2x^2\right)}{}$$

$$=\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{e\left(1+c^2x^2\right)}{}$$

$$=-\frac{b(d-e)x}{2c}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)-$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right.$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}-\frac{be\tan^{-1}(cx)}{c^2}+\frac{1}{2}dx^2($$

Mathematica [A] time = 0.10, size = 105, normalized size = 0.77

$$\frac{e\log\left(c^2x^2+1\right)\left(ac^2x^2+a-bcx\right)+cx(acx(d-e)-b(d-3e))+b\tan^{-1}(cx)\left(c^2dx^2-e\left(c^2x^2+3\right)+\left(c^2ex^2+e\right)\mathrm{lo}\right.}{2c^2}$$

Antiderivative was successfully verified.

```
[In] Integrate[x*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] (c*x*(-(b*(d - 3*e)) + a*c*(d - e)*x) + e*(a - b*c*x + a*c^2*x^2)*Log[1 + c
^2*x^2] + b*ArcTan[c*x]*(d + c^2*d*x^2 - e*(3 + c^2*x^2) + (e + c^2*e*x^2)*
Log[1 + c^2*x^2]))/(2*c^2)
```

fricas [A] time = 0.42, size = 116, normalized size = 0.85

$$\frac{\left(ac^2d-ac^2e\right)x^2-(bcd-3\,bce)x+\left(\left(bc^2d-bc^2e\right)x^2+bd-3\,be\right)\arctan(cx)+\left(ac^2ex^2-bcex+ae+\left(bc^2ex^2+be\right.\right.}{2\,c^2}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="fricas")
```

```
[Out] 1/2*((a*c^2*d - a*c^2*e)*x^2 - (b*c*d - 3*b*c*e)*x + ((b*c^2*d - b*c^2*e)*x
^2 + b*d - 3*b*e)*arctan(c*x) + (a*c^2*e*x^2 - b*c*e*x + a*e + (b*c^2*e*x^2
 + b*e)*arctan(c*x))*log(c^2*x^2 + 1))/c^2
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [C] time = 2.68, size = 3074, normalized size = 22.44

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1)),x)
```

```
[Out] 3/2*b*e*x/c-1/2*a*x^2*e+1/4*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2
/(c^2*x^2+1)+1)^2)^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*arctan(c*x)*Pi*x^2*e+1
/2*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2)
)*arctan(c*x)*Pi*x^2*e-1/4*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*
c*x)/(c^2*x^2+1)^(1/2))^2*arctan(c*x)*Pi*x^2*e+1/4*I*b*csgn(I*((1+I*c*x)^2/
(c^2*x^2+1)+1))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*arctan(c*x)*Pi*x^2*
e-1/2*I*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+
1)+1)^2)^2*arctan(c*x)*Pi*x^2*e-1/4*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1
))^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x*e+1/2*I/c*b*csgn(I*((1+I*c*
x)^2/(c^2*x^2+1)+1))*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*Pi*x*e+1/4*I/c
^2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I
/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*e*arctan(c*x)+1/4*I/c^2*b*csgn(I*(1+I*c*
x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*(1+I*c*x)^2/(c^2*x
^2+1))*Pi*e*arctan(c*x)+1/2*I/c^2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(
I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*Pi*e*arctan(c*x)-1/2*b*d*x/c+1/2*b*d*arctan(
c*x)/c^2-I/c^2*b*e*ln(2)+b*ln(2)*arctan(c*x)*x^2*e-b*ln((1+I*c*x)^2/(c^2*x^
2+1)+1)*arctan(c*x)*x^2*e-1/2*b*arctan(c*x)*x^2*e+1/2*a*e/c^2*ln(c^2*x^2+1)
-1/4/c^2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*
Pi*e-1/4/c^2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*e+1/4*I/c*b*csgn(I*(1+I
*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I/((1+I*c*x)^2/(c^2
*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*Pi*x*e-1/4*I/c^2*b*csgn(I*(1+
I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2
*x^2+1))*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*e*arctan(c*x)-1/4*I*b*csg
n(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I/((1+I*c*x
)^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*arctan(c*x)*Pi*x^2*e-
1/2*I/c^2*b*d+3/2*I/c^2*b*e-1/4*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*
x)^2/(c^2*x^2+1)+1)^2)^3*arctan(c*x)*Pi*x^2*e-1/4*I*b*csgn(I*(1+I*c*x)^2/(c
^2*x^2+1))^3*arctan(c*x)*Pi*x^2*e+1/4*I*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1
)^2)^3*arctan(c*x)*Pi*x^2*e+1/4*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*
c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x*e+1/4*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))
^3*Pi*x*e-1/4*I/c*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*x*e-1/4*I/c^
2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*e*ar
ctan(c*x)-1/4*I/c^2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^3*Pi*e*arctan(c*x)+1/
4*I/c^2*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*e*arctan(c*x)-1/4*I/c^
2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))^2*P
i*e*arctan(c*x)+1/4*I/c^2*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*((
1+I*c*x)^2/(c^2*x^2+1)+1))^2*Pi*e*arctan(c*x)-1/2*I/c^2*b*csgn(I*((1+I*c*x)
^2/(c^2*x^2+1)+1)^2)^2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*Pi*e*arctan(c*x)
-1/4*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*
csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*Pi*x*e-1/4*I/c*b*csgn(I*(1+I*c*x)^2/(
c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))
*Pi*x*e-1/2*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x
^2+1)^(1/2))*Pi*x*e+1/4*I/c*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c
*x)/(c^2*x^2+1)^(1/2))^2*Pi*x*e+1/4*I*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+
I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*arctan(c
*x)*Pi*x^2*e+1/4/c^2*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^3*Pi*e-1/c*b*l
n(2)*x*e+1/c*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*x*e+1/c^2*b*ln(2)*e*arctan(c*x
```

```
)-1/c^2*b*ln((1+I*c*x)^2/(c^2*x^2+1)+1)*e*arctan(c*x)+1/c^2*b*e*(arctan(c*x
)*x*c-1-I*arctan(c*x))*(I+c*x)*ln((1+I*c*x)/(c^2*x^2+1)^(1/2))+1/4/c^2*b*cs
gn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I/((1+I*
c*x)^2/(c^2*x^2+1)+1)^2)*Pi*e+1/4/c^2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1)/((1+
I*c*x)^2/(c^2*x^2+1)+1)^2)^2*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*Pi*e+1/2/c^2*b
*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))^2*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/2))*e*Pi
-1/4/c^2*b*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)/(c^2*x^2+1)^(1/
2))^2*Pi*e+1/4/c^2*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)*csgn(I*((1+I*c*x
)^2/(c^2*x^2+1)+1))^2*Pi*e-1/2/c^2*b*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1)^2)^
2*csgn(I*((1+I*c*x)^2/(c^2*x^2+1)+1))*e*Pi-1/4/c^2*b*e*Pi*csgn(I/((1+I*c*x)
^2/(c^2*x^2+1)+1)^2)*csgn(I*(1+I*c*x)^2/(c^2*x^2+1))*csgn(I*(1+I*c*x)^2/(c^
2*x^2+1)/((1+I*c*x)^2/(c^2*x^2+1)+1)^2)-5/2*b*e*arctan(c*x)/c^2+1/2*a*x^2*d
+1/2*x^2*a*e*ln(c^2*x^2+1)-1/2*a*e/c^2+1/2*b*arctan(c*x)*d*x^2
```

maxima [A] time = 0.43, size = 149, normalized size = 1.09

$$\frac{1}{2}\,adx^2+\frac{1}{2}\left(x^2\arctan\left(cx\right)-c\left(\frac{x}{c^2}-\frac{\arctan\left(cx\right)}{c^3}\right)\right)bd-\frac{\left(x\log\left(c^2x^2+1\right)-3\,x+\frac{2\,\arctan(cx)}{c}\right)be}{2\,c}-\frac{\left(c^2x^2-\left(c^2x^2+1\right)1\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="maxima")
```

```
[Out] 1/2*a*d*x^2 + 1/2*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*d - 1/2
*(x*log(c^2*x^2 + 1) - 3*x + 2*arctan(c*x)/c)*b*e/c - 1/2*(c^2*x^2 - (c^2*x
^2 + 1)*log(c^2*x^2 + 1) + 1)*b*e*arctan(c*x)/c^2 - 1/2*(c^2*x^2 - (c^2*x^2
 + 1)*log(c^2*x^2 + 1) + 1)*a*e/c^2
```

mupad [B] time = 1.26, size = 227, normalized size = 1.66

$$\frac{a\,d\,x^2}{2}-\frac{a\,e\,x^2}{2}-\frac{b\,d\,x}{2\,c}+\frac{3\,b\,e\,x}{2\,c}+\frac{b\,d\,x^2\,\mathrm{atan}\left(c\,x\right)}{2}-\frac{b\,e\,x^2\,\mathrm{atan}\left(c\,x\right)}{2}+\frac{a\,e\,\ln\left(c^2\,x^2+1\right)}{2\,c^2}+\frac{b\,d\,\mathrm{atan}\left(\frac{b\,c\,d\,x}{b\,d-3\,b\,e}-\frac{3\,b\,c\,e\,x}{b\,d-3\,b\,e}\right)}{2\,c^2}-\frac{3}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)),x)
```

```
[Out] (a*d*x^2)/2 - (a*e*x^2)/2 - (b*d*x)/(2*c) + (3*b*e*x)/(2*c) + (b*d*x^2*atan
(c*x))/2 - (b*e*x^2*atan(c*x))/2 + (a*e*log(c^2*x^2 + 1))/(2*c^2) + (b*d*at
an((b*c*d*x)/(b*d - 3*b*e) - (3*b*c*e*x)/(b*d - 3*b*e)))/(2*c^2) - (3*b*e*a
tan((b*c*d*x)/(b*d - 3*b*e) - (3*b*c*e*x)/(b*d - 3*b*e)))/(2*c^2) + (a*e*x^
2*log(c^2*x^2 + 1))/2 - (b*e*x*log(c^2*x^2 + 1))/(2*c) + (b*e*atan(c*x)*log
(c^2*x^2 + 1))/(2*c^2) + (b*e*x^2*atan(c*x)*log(c^2*x^2 + 1))/2
```

sympy [A] time = 3.31, size = 202, normalized size = 1.47

$$\begin{cases}\frac{adx^2}{2}+\frac{aex^2\log\left(c^2x^2+1\right)}{2}-\frac{aex^2}{2}+\frac{ae\log\left(c^2x^2+1\right)}{2c^2}+\frac{bdx^2\,\mathrm{atan}\,(cx)}{2}+\frac{bex^2\log\left(c^2x^2+1\right)\mathrm{atan}\,(cx)}{2}-\frac{bex^2\,\mathrm{atan}\,(cx)}{2}-\frac{bdx}{2c}-\frac{bex\log\left(c^2x^2\right.}{2c} \\ \frac{adx^2}{2}\end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))*(d+e*ln(c**2*x**2+1)),x)
```

```
[Out] Piecewise((a*d*x**2/2 + a*e*x**2*log(c**2*x**2 + 1)/2 - a*e*x**2/2 + a*e*lo
g(c**2*x**2 + 1)/(2*c**2) + b*d*x**2*atan(c*x)/2 + b*e*x**2*log(c**2*x**2 +
 1)*atan(c*x)/2 - b*e*x**2*atan(c*x)/2 - b*d*x/(2*c) - b*e*x*log(c**2*x**2
+ 1)/(2*c) + 3*b*e*x/(2*c) + b*d*atan(c*x)/(2*c**2) + b*e*log(c**2*x**2 + 1
)*atan(c*x)/(2*c**2) - 3*b*e*atan(c*x)/(2*c**2), Ne(c, 0)), (a*d*x**2/2, Tr
ue))
```

3.1290 $\int \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)\,dx$

Optimal. Leaf size=100

$$x\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)+\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{bc}-2aex-\frac{b\left(e\log\left(c^2x^2+1\right)+d\right)^2}{4ce}+\frac{be\log\left(c^2x^2+\right.}{c}$$

```
[Out] -2*a*e*x-2*b*e*x*arctan(c*x)+e*(a+b*arctan(c*x))^2/b/c+b*e*ln(c^2*x^2+1)/c+
x*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))-1/4*b*(d+e*ln(c^2*x^2+1))^2/c/e
```

Rubi [A] time = 0.19, antiderivative size = 100, normalized size of antiderivative = 1.00, number of steps used = 9, number of rules used = 8, integrand size = 23, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.348, Rules used = {5009, 2475, 2390, 2301, 4916, 4846, 260, 4884}

$$x\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)+\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{bc}-2aex-\frac{b\left(e\log\left(c^2x^2+1\right)+d\right)^2}{4ce}+\frac{be\log\left(c^2x^2+\right.}{c}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] -2*a*e*x - 2*b*e*x*ArcTan[c*x] + (e*(a + b*ArcTan[c*x])^2)/(b*c) + (b*e*Log
[1 + c^2*x^2])/c + x*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]) - (b*(d +
 e*Log[1 + c^2*x^2])^2)/(4*c*e)
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2390

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_))^(q_.), x_Symbol] :> Dist[1/e, Subst[Int[((f*x)/d)^q*(a + b*Log[c*x^
n])^p, x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e, f, g, n, p, q}, x] && E
qQ[e*f - d*g, 0]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 5009

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.)), x_Symbol] :> Simp[x*(d + e*Log[f + g*x^2])*(a + b*ArcTan[c*x]), x] +
 (-Dist[b*c, Int[(x*(d + e*Log[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[2*
e*g, Int[(x^2*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c,
d, e, f, g}, x]
```

Rubi steps

$$\int \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)\,dx = x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)-(bc)\int \frac{x\left(d+e\log\left(1\right.\right.}{1+c^2\ldots}$$

$$= x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{d+e\ldots}{\ldots}\right.$$

$$= -2aex+\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{bc}+x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1\ldots\right.\right.$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{bc}+x\left(a+b\tan^{-1}(c\ldots\right.$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{e\left(a+b\tan^{-1}(cx)\right)^2}{bc}+\frac{be\log\left(1+c^2x^2\ldots\right.}{c}$$

Mathematica [A] time = 0.02, size = 138, normalized size = 1.38

$$aex\log\left(c^2x^2+1\right)+\frac{2ae\tan^{-1}(cx)}{c}+adx-2aex-\frac{bd\log\left(c^2x^2+1\right)}{2c}-\frac{be\log^2\left(c^2x^2+1\right)}{4c}+\frac{be\log\left(c^2x^2+1\right)}{c}+bex\log\left(\ldots\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]),x]
```

```
[Out] a*d*x - 2*a*e*x + (2*a*e*ArcTan[c*x])/c + b*d*x*ArcTan[c*x] - 2*b*e*x*ArcTa
n[c*x] + (b*e*ArcTan[c*x]^2)/c - (b*d*Log[1 + c^2*x^2])/(2*c) + (b*e*Log[1
+ c^2*x^2])/c + a*e*x*Log[1 + c^2*x^2] + b*e*x*ArcTan[c*x]*Log[1 + c^2*x^2]
 - (b*e*Log[1 + c^2*x^2]^2)/(4*c)
```

fricas [A] time = 0.46, size = 105, normalized size = 1.05

$$\frac{4\,be\arctan\left(cx\right)^2-be\log\left(c^2x^2+1\right)^2+4\left(acd-2\,ace\right)x+4\left(2\,ae+\left(bcd-2\,bce\right)x\right)\arctan\left(cx\right)+2\left(2\,bcex\arctan\left(\ldots\right.\right.}{4\,c}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="fricas")
```

```
[Out] 1/4*(4*b*e*arctan(c*x)^2 - b*e*log(c^2*x^2 + 1)^2 + 4*(a*c*d - 2*a*c*e)*x +
 4*(2*a*e + (b*c*d - 2*b*c*e)*x)*arctan(c*x) + 2*(2*b*c*e*x*arctan(c*x) + 2
*a*c*e*x - b*d + 2*b*e)*log(c^2*x^2 + 1))/c
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [A] time = 0.69, size = 192, normalized size = 1.92

$$axd+bd\arctan(cx)x-\frac{bd\ln(c^2x^2+1)}{2c}+\frac{be\ln\left(\frac{2}{1+\frac{-c^2x^2+1}{c^2x^2+1}}\right)}{c}+\frac{b\arctan(cx)^2e}{c}-\frac{be\ln\left(\frac{2}{1+\frac{-c^2x^2+1}{c^2x^2+1}}\right)^2}{4c}-2bex\arctan(cx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1)),x)
```

```
[Out] a*x*d+b*d*arctan(c*x)*x-1/2*b*d*ln(c^2*x^2+1)/c+1/c*b*e*ln(2/(1+(-c^2*x^2+1
)/(c^2*x^2+1)))+1/c*b*arctan(c*x)^2*e-1/4/c*b*e*ln(2/(1+(-c^2*x^2+1)/(c^2*x
^2+1)))^2-2*b*e*x*arctan(c*x)+b*e*arctan(c*x)*x*ln(2/(1+(-c^2*x^2+1)/(c^2*x
^2+1)))+a*x*e*ln(c^2*x^2+1)-2*a*e*x+2*a*e/c*arctan(c*x)
```

maxima [A] time = 0.44, size = 153, normalized size = 1.53

$$-\left(2c^2\left(\frac{x}{c^2}-\frac{\arctan(cx)}{c^3}\right)-x\log\left(c^2x^2+1\right)\right)be\arctan(cx)-\left(2c^2\left(\frac{x}{c^2}-\frac{\arctan(cx)}{c^3}\right)-x\log\left(c^2x^2+1\right)\right)ae+ad$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1)),x, algorithm="maxima")
```

```
[Out] -(2*c^2*(x/c^2 - arctan(c*x)/c^3) - x*log(c^2*x^2 + 1))*b*e*arctan(c*x) - (
2*c^2*(x/c^2 - arctan(c*x)/c^3) - x*log(c^2*x^2 + 1))*a*e + a*d*x + 1/2*(2*
c*x*arctan(c*x) - log(c^2*x^2 + 1))*b*d/c - 1/4*(4*arctan(c*x)^2 + log(c^2*
x^2 + 1)^2 - 4*log(c^2*x^2 + 1))*b*e/c
```

mupad [B] time = 0.99, size = 134, normalized size = 1.34

$$a\,d\,x-2\,a\,e\,x-\frac{b\,e\ln\left(c^2\,x^2+1\right)^2}{4\,c}+b\,d\,x\,\mathrm{atan}\left(c\,x\right)-2\,b\,e\,x\,\mathrm{atan}\left(c\,x\right)+a\,e\,x\,\ln\left(c^2\,x^2+1\right)+\frac{2\,a\,e\,\mathrm{atan}\left(c\,x\right)}{c}-\frac{b\,d\,\ln\left(\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)),x)
```

```
[Out] a*d*x - 2*a*e*x - (b*e*log(c^2*x^2 + 1)^2)/(4*c) + b*d*x*atan(c*x) - 2*b*e*
x*atan(c*x) + a*e*x*log(c^2*x^2 + 1) + (2*a*e*atan(c*x))/c - (b*d*log(c^2*x
^2 + 1))/(2*c) + (b*e*log(c^2*x^2 + 1))/c + (b*e*atan(c*x)^2)/c + b*e*x*ata
n(c*x)*log(c^2*x^2 + 1)
```

sympy [A] time = 1.94, size = 148, normalized size = 1.48

$$\begin{cases} adx + aex\log\left(c^2x^2+1\right) - 2aex + \frac{2ae\,\mathrm{atan}\,(cx)}{c} + bdx\,\mathrm{atan}\,(cx) + bex\log\left(c^2x^2+1\right)\mathrm{atan}\,(cx) - 2bex\,\mathrm{atan}\,(cx) \\ adx \end{cases}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(c**2*x**2+1)),x)
```

```
[Out] Piecewise((a*d*x + a*e*x*log(c**2*x**2 + 1) - 2*a*e*x + 2*a*e*atan(c*x)/c +
 b*d*x*atan(c*x) + b*e*x*log(c**2*x**2 + 1)*atan(c*x) - 2*b*e*x*atan(c*x) -
 b*d*log(c**2*x**2 + 1)/(2*c) - b*e*log(c**2*x**2 + 1)**2/(4*c) + b*e*log(c
**2*x**2 + 1)/c + b*e*atan(c*x)**2/c, Ne(c, 0)), (a*d*x, True))
```

3.1291 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(1+c^2x^2))}{x}\,dx$

Optimal. Leaf size=282

$$-\frac{1}{2}ae\text{Li}_2\left(-c^2x^2\right)+ad\log(x)-\frac{1}{2}ibe\text{Li}_2(-icx)\left(-\log\left(c^2x^2+1\right)+\log(1-icx)+\log(1+icx)\right)+\frac{1}{2}ibe\text{Li}_2(icx)\left(-\text{lo}\right.$$

```
[Out] a*d*ln(x)+1/2*I*b*e*ln(I*c*x)*ln(1-I*c*x)^2-1/2*I*b*e*ln(-I*c*x)*ln(1+I*c*x
)^2+1/2*I*b*d*polylog(2,-I*c*x)-1/2*I*b*e*(ln(1-I*c*x)+ln(1+I*c*x)-ln(c^2*x
^2+1))*polylog(2,-I*c*x)-1/2*I*b*d*polylog(2,I*c*x)+1/2*I*b*e*(ln(1-I*c*x)+
ln(1+I*c*x)-ln(c^2*x^2+1))*polylog(2,I*c*x)-1/2*a*e*polylog(2,-c^2*x^2)+I*b
*e*ln(1-I*c*x)*polylog(2,1-I*c*x)-I*b*e*ln(1+I*c*x)*polylog(2,1+I*c*x)-I*b*
e*polylog(3,1-I*c*x)+I*b*e*polylog(3,1+I*c*x)
```

Rubi [A] time = 0.34, antiderivative size = 282, normalized size of antiderivative = 1.00, number of steps used = 18, number of rules used = 9, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.346, Rules used = {5015, 4848, 2391, 5013, 5011, 2396, 2433, 2374, 6589}

$$-\frac{1}{2}ae\text{PolyLog}\left(2,-c^2x^2\right)-\frac{1}{2}ibe\left(-\log\left(c^2x^2+1\right)+\log(1-icx)+\log(1+icx)\right)\text{PolyLog}(2,-icx)+\frac{1}{2}ibe\left(-\log\right.$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x,x]
```

```
[Out] a*d*Log[x] + (I/2)*b*e*Log[I*c*x]*Log[1 - I*c*x]^2 - (I/2)*b*e*Log[(-I)*c*x
]*Log[1 + I*c*x]^2 + (I/2)*b*d*PolyLog[2, (-I)*c*x] - (I/2)*b*e*(Log[1 - I*
c*x] + Log[1 + I*c*x] - Log[1 + c^2*x^2])*PolyLog[2, (-I)*c*x] - (I/2)*b*d*
PolyLog[2, I*c*x] + (I/2)*b*e*(Log[1 - I*c*x] + Log[1 + I*c*x] - Log[1 + c^
2*x^2])*PolyLog[2, I*c*x] - (a*e*PolyLog[2, -(c^2*x^2)])/2 + I*b*e*Log[1 -
I*c*x]*PolyLog[2, 1 - I*c*x] - I*b*e*Log[1 + I*c*x]*PolyLog[2, 1 + I*c*x] -
 I*b*e*PolyLog[3, 1 - I*c*x] + I*b*e*PolyLog[3, 1 + I*c*x]
```

Rule 2374

```
Int[(Log[(d_.)*((e_) + (f_.)*(x_)^(m_.))]*((a_.) + Log[(c_.)*(x_)^(n_.)]*(b
_.))^(p_.))/(x_), x_Symbol] :> -Simp[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x
^n])^p)/m, x] + Dist[(b*n*p)/m, Int[(PolyLog[2, -(d*f*x^m)]*(a + b*Log[c*x^
n])^(p - 1))/x, x], x] /; FreeQ[{a, b, c, d, e, f, m, n}, x] && IGtQ[p, 0]
&& EqQ[d*e, 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2396

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_)/((f_.) + (g_.
)*(x_)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d
+ e*x)^n])^p)/g, x] - Dist[(b*e*n*p)/g, Int[(Log[(e*(f + g*x))/(e*f - d*g)]
*(a + b*Log[c*(d + e*x)^n])^(p - 1))/(d + e*x), x], x] /; FreeQ[{a, b, c, d
, e, f, g, n, p}, x] && NeQ[e*f - d*g, 0] && IGtQ[p, 1]
```

Rule 2433

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + Log
[(h_.)*((i_.) + (j_.)*(x_))^(m_.)]*(g_.))*((k_.) + (l_.)*(x_))^(r_.), x_Sym
bol] :> Dist[1/e, Subst[Int[((k*x)/d)^r*(a + b*Log[c*x^n])^p*(f + g*Log[h*(
(e*i - d*j)/e + (j*x)/e)^m]), x], x, d + e*x], x] /; FreeQ[{a, b, c, d, e,
```

```
f, g, h, i, j, k, l, n, p, r}, x] && EqQ[e*k - d*l, 0]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 5011

```
Int[(ArcTan[(c_.)*(x_)]*Log[(f_.) + (g_.)*(x_)^2])/(x_), x_Symbol] :> Dist[
Log[f + g*x^2] - Log[1 - I*c*x] - Log[1 + I*c*x], Int[ArcTan[c*x]/x, x], x]
 + (Dist[I/2, Int[Log[1 - I*c*x]^2/x, x], x] - Dist[I/2, Int[Log[1 + I*c*x]
^2/x, x], x]) /; FreeQ[{c, f, g}, x] && EqQ[g, c^2*f]
```

Rule 5013

```
Int[(Log[(f_.) + (g_.)*(x_)^2]*(ArcTan[(c_.)*(x_)]*(b_.) + (a_)))/(x_), x_S
ymbol] :> Dist[a, Int[Log[f + g*x^2]/x, x], x] + Dist[b, Int[(Log[f + g*x^2
]*ArcTan[c*x])/x, x], x] /; FreeQ[{a, b, c, f, g}, x]
```

Rule 5015

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(Log[(f_.) + (g_.)*(x_)^2]*(e_.) +
(d_)))/(x_), x_Symbol] :> Dist[d, Int[(a + b*ArcTan[c*x])/x, x], x] + Dist[
e, Int[(Log[f + g*x^2]*(a + b*ArcTan[c*x]))/x, x], x] /; FreeQ[{a, b, c, d,
 e, f, g}, x]
```

Rule 6589

```
Int[PolyLog[n_, (c_.)*((a_.) + (b_.)*(x_))^(p_.)]/((d_.) + (e_.)*(x_)), x_S
ymbol] :> Simp[PolyLog[n + 1, c*(a + b*x)^p]/(e*p), x] /; FreeQ[{a, b, c, d
, e, n, p}, x] && EqQ[b*d, a*e]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x}\,dx = d\int \frac{a+b\tan^{-1}(cx)}{x}\,dx + e\int \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(1+c^2x^2\right)}{x}\,dx$$

$$= ad\log(x) + \frac{1}{2}(ibd)\int \frac{\log(1-icx)}{x}\,dx - \frac{1}{2}(ibd)\int \frac{\log(1+icx)}{x}\,dx$$

$$= ad\log(x) + \frac{1}{2}ibd\text{Li}_2(-icx) - \frac{1}{2}ibd\text{Li}_2(icx) - \frac{1}{2}ae\text{Li}_2\left(-c^2x^2\right) + \frac{1}{2}($$

$$= ad\log(x) + \frac{1}{2}ibe\log(icx)\log^2(1-icx) - \frac{1}{2}ibe\log(-icx)\log^2(1+$$

$$= ad\log(x) + \frac{1}{2}ibe\log(icx)\log^2(1-icx) - \frac{1}{2}ibe\log(-icx)\log^2(1+$$

$$= ad\log(x) + \frac{1}{2}ibe\log(icx)\log^2(1-icx) - \frac{1}{2}ibe\log(-icx)\log^2(1+$$

$$= ad\log(x) + \frac{1}{2}ibe\log(icx)\log^2(1-icx) - \frac{1}{2}ibe\log(-icx)\log^2(1+$$

Mathematica [F] time = 0.21, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x,x]
[Out] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x, x]
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bd\arctan(cx) + ad + (be\arctan(cx) + ae)\log\left(c^2x^2 + 1\right)}{x}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x,x, algorithm="fricas")
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(c^2*x^2 + 1))
/x, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x,x, algorithm="giac")
[Out] Timed out
```

maple [C] time = 6.09, size = 6931, normalized size = 24.58

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x,x)
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$ad\log(x) + \frac{1}{2}\int \frac{2\left(bd\arctan(cx) + (be\arctan(cx) + ae)\log\left(c^2x^2 + 1\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x,x, algorithm="maxima")
[Out] a*d*log(x) + 1/2*integrate(2*(b*d*arctan(c*x) + (b*e*arctan(c*x) + a*e)*log
(c^2*x^2 + 1))/x, x)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}(c\,x))\,\left(d + e\,\ln\left(c^2\,x^2 + 1\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x,x)
[Out] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(c**2*x**2+1))/x,x)
```

```
[Out] Timed out
```

3.1292 $\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x^2}\,dx$

Optimal. Leaf size=100

$$-\frac{\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{x}+\frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b}+\frac{1}{2}bc\log\left(1-\frac{1}{c^2x^2+1}\right)\left(e\log\left(c^2x^2+1\right)+d\right)$$

```
[Out] c*e*(a+b*arctan(c*x))^2/b-(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x+1/2*b*c*(
d+e*ln(c^2*x^2+1))*ln(1-1/(c^2*x^2+1))-1/2*b*c*e*polylog(2,1/(c^2*x^2+1))
```

Rubi [A] time = 0.25, antiderivative size = 92, normalized size of antiderivative = 0.92, number of steps used = 8, number of rules used = 8, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.308, Rules used = {5017, 2475, 2411, 2344, 2301, 2316, 2315, 4884}

$$-\frac{1}{2}bce\text{PolyLog}\left(2,-c^2x^2\right)-\frac{\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{x}+\frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b}-\frac{bc\left(e\log\left(c^2x^2+1\right)\right.}{4e}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^2,x]
```

```
[Out] (c*e*(a + b*ArcTan[c*x])^2)/b + b*c*d*Log[x] - ((a + b*ArcTan[c*x])*(d + e*
Log[1 + c^2*x^2]))/x - (b*c*(d + e*Log[1 + c^2*x^2])^2)/(4*e) - (b*c*e*Poly
Log[2, -(c^2*x^2)])/2
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2316

```
Int[((a_.) + Log[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[
((a + b*Log[-((c*d)/e)])*Log[d + e*x])/e, x] + Dist[b, Int[Log[-((e*x)/d)]/
(d + e*x), x], x] /; FreeQ[{a, b, c, d, e}, x] && GtQ[-((c*d)/e), 0]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 5017

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> Simp[(x^(m + 1)*(d + e*Log[f + g*x^2])*(a +
b*ArcTan[c*x]))/(m + 1), x] + (-Dist[(b*c)/(m + 1), Int[(x^(m + 1)*(d + e*L
og[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[(2*e*g)/(m + 1), Int[(x^(m + 2
)*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c, d, e, f, g},
 x] && ILtQ[m/2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x^2}\,dx = -\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x} + (bc)\int \frac{d+e\log\left(1+\right.}{x\left(1+c^2x\right.}$$

$$= \frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b} - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x} +$$

$$= \frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b} - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x} +$$

$$= \frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b} - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x} +$$

$$= \frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b} + bcd\log(x) - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\right.}{x}$$

$$= \frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b} + bcd\log(x) - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\right.}{x}$$

Mathematica [A] time = 0.11, size = 111, normalized size = 1.11

$$-\frac{\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{x}+\frac{ce\left(a+b\tan^{-1}(cx)\right)^2}{b}+bc\left(\frac{1}{2}e\text{Li}_2\left(c^2x^2+1\right)-\frac{\left(e\log\left(c^2x^2+1\right)+d\right)\left(-\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^2,x]
```

```
[Out] (c*e*(a + b*ArcTan[c*x])^2)/b - ((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2
]))/x + b*c*(-1/4*((d + e*Log[1 + c^2*x^2])*(d - 2*e*Log[-(c^2*x^2)] + e*Lo
g[1 + c^2*x^2]))/e + (e*PolyLog[2, 1 + c^2*x^2])/2)
```

fricas [F] time = 0.42, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bd\arctan\left(cx\right)+ad+\left(be\arctan\left(cx\right)+ae\right)\log\left(c^{2}x^{2}+1\right)}{x^{2}},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(c^2*x^2 + 1))
/x^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 11.28, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\arctan\left(cx\right)\right)\left(d+e\ln\left(c^{2}x^{2}+1\right)\right)}{x^{2}}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^2,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(c\left(\log\left(c^{2}x^{2}+1\right)-\log\left(x^{2}\right)\right)+\frac{2\arctan\left(cx\right)}{x}\right)bd+\left(2c\arctan\left(cx\right)-\frac{\log\left(c^{2}x^{2}+1\right)}{x}\right)ae+be\int\frac{\arctan\left(cx\right)\log\left(c^{2}x^{2}+1\right)}{x^{2}}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^2,x, algorithm="maxima")
```

```
[Out] -1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d + (2*c*arctan(
c*x) - log(c^2*x^2 + 1)/x)*a*e + b*e*integrate(arctan(c*x)*log(c^2*x^2 + 1)
/x^2, x) - a*d/x
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\left(d+e\,\ln\left(c^2\,x^2+1\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^2, x)
```

sympy [A] time = 141.61, size = 160, normalized size = 1.60

$$-\frac{ad}{x}+\frac{2ae\,\mathrm{atan}\left(\frac{x}{\sqrt{\frac{1}{c^{2}}}}\right)}{\sqrt{\frac{1}{c^{2}}}}-\frac{ae\log\left(c^{2}x^{2}+1\right)}{x}-bc^{3}e\left(\begin{cases}0 & \text{for}\ c^{2}=0\\ \frac{\log\left(c^{2}x^{2}+1\right)^{2}}{4c^{2}} & \text{otherwise}\end{cases}\right)+4bc^{2}e\left(\begin{cases}0 & \text{for}\ c=0\\ \frac{\mathrm{atan}^{2}\left(cx\right)}{4c} & \text{otherwise}\end{cases}\right)-$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(c**2*x**2+1))/x**2,x)
```

```
[Out] -a*d/x + 2*a*e*atan(x/sqrt(c**(-2)))/sqrt(c**(-2)) - a*e*log(c**2*x**2 + 1)
/x - b*c**3*e*Piecewise((0, Eq(c**2, 0)), (log(c**2*x**2 + 1)**2/(4*c**2),
True)) + 4*b*c**2*e*Piecewise((0, Eq(c, 0)), (atan(c*x)**2/(4*c), True)) -
b*c*d*log(c**2 + x**(-2))/2 - b*c*e*polylog(2, c**2*x**2*exp_polar(I*pi))/2
 - b*d*atan(c*x)/x - b*e*log(c**2*x**2 + 1)*atan(c*x)/x
```

3.1293 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(1+c^2x^2))}{x^3}\,dx$

Optimal. Leaf size=154

$$-\frac{(a+b\tan^{-1}(cx))(e\log(c^2x^2+1)+d)}{2x^2}-\frac{1}{2}ac^2e\log(c^2x^2+1)+ac^2e\log(x)-\frac{bc(e\log(c^2x^2+1)+d)}{2x}-\frac{1}{2}bc^2\,\text{ta}$$

```
[Out] b*c^2*e*arctan(c*x)+a*c^2*e*ln(x)-1/2*a*c^2*e*ln(c^2*x^2+1)-1/2*b*c*(d+e*ln
(c^2*x^2+1))/x-1/2*b*c^2*arctan(c*x)*(d+e*ln(c^2*x^2+1))-1/2*(a+b*arctan(c*
x))*(d+e*ln(c^2*x^2+1))/x^2+1/2*I*b*c^2*e*polylog(2,-I*c*x)-1/2*I*b*c^2*e*p
olylog(2,I*c*x)
```

Rubi [A] time = 0.14, antiderivative size = 154, normalized size of antiderivative = 1.00, number of steps used = 10, number of rules used = 9, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.346, Rules used = {4852, 325, 203, 5021, 801, 635, 260, 4848, 2391}

$$\frac{1}{2}ibc^2e\text{PolyLog}(2,-icx)-\frac{1}{2}ibc^2e\text{PolyLog}(2,icx)-\frac{(a+b\tan^{-1}(cx))(e\log(c^2x^2+1)+d)}{2x^2}-\frac{1}{2}ac^2e\log(c^2x^2+1$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^3,x]
```

```
[Out] b*c^2*e*ArcTan[c*x] + a*c^2*e*Log[x] - (a*c^2*e*Log[1 + c^2*x^2])/2 - (b*c*
(d + e*Log[1 + c^2*x^2]))/(2*x) - (b*c^2*ArcTan[c*x]*(d + e*Log[1 + c^2*x^2
]))/2 - ((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/(2*x^2) + (I/2)*b*c^
2*e*PolyLog[2, (-I)*c*x] - (I/2)*b*c^2*e*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x^3}\,dx = -\frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\left(1+c^2x^2\right)\right.$$

$$= -\frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\left(1+c^2x^2\right)\right.$$

$$= -\frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\left(1+c^2x^2\right)\right.$$

$$= ac^2e\log(x) - \frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\right.$$

$$= ac^2e\log(x) - \frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\right.$$

$$= bc^2e\tan^{-1}(cx) + ac^2e\log(x) - \frac{1}{2}ac^2e\log\left(1+c^2x^2\right) - \frac{bc\left(d+e\log\right.}{}$$

Mathematica [A] time = 0.13, size = 189, normalized size = 1.23

$$-\frac{-2ac^2ex^2\log(x) + ac^2ex^2\log\left(c^2x^2+1\right) + ae\log\left(c^2x^2+1\right) + ad + bc^2dx^2\tan^{-1}(cx) - ibc^2ex^2\text{Li}_2(-icx) + ibc^2e}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^3,x]
```

```
[Out] -1/2*(a*d + b*c*d*x + b*d*ArcTan[c*x] + b*c^2*d*x^2*ArcTan[c*x] - 2*b*c^2*e
*x^2*ArcTan[c*x] - 2*a*c^2*e*x^2*Log[x] + a*e*Log[1 + c^2*x^2] + b*c*e*x*Lo
g[1 + c^2*x^2] + a*c^2*e*x^2*Log[1 + c^2*x^2] + b*e*ArcTan[c*x]*Log[1 + c^2
```

```
*x^2] + b*c^2*e*x^2*ArcTan[c*x]*Log[1 + c^2*x^2] - I*b*c^2*e*x^2*PolyLog[2,
 (-I)*c*x] + I*b*c^2*e*x^2*PolyLog[2, I*c*x])/x^2
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bd \arctan(cx) + ad + (be \arctan(cx) + ae)\log\left(c^2x^2 + 1\right)}{x^3}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(c^2*x^2 + 1))
/x^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 38.69, size = 0, normalized size = 0.00

$$\int \frac{(a + b \arctan(cx))\left(d + e\ln\left(c^2x^2 + 1\right)\right)}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^3,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(\left(c \arctan(cx) + \frac{1}{x}\right)c + \frac{\arctan(cx)}{x^2}\right)bd - \frac{1}{2}\left(c^2\left(\log\left(c^2x^2 + 1\right) - \log\left(x^2\right)\right) + \frac{\log\left(c^2x^2 + 1\right)}{x^2}\right)ae + \frac{\left(2c^4x^2 \int \frac{x}{}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d - 1/2*(c^2*(log(c^2*x^
2 + 1) - log(x^2)) + log(c^2*x^2 + 1)/x^2)*a*e + 1/2*(4*c^4*x^2*integrate(1
/2*x*arctan(c*x)/(c^2*x^2 + 1), x) + 2*c^2*x^2*arctan(c*x) + 4*c^2*x^2*inte
grate(1/2*arctan(c*x)/(c^2*x^3 + x), x) - (c*x + (c^2*x^2 + 1)*arctan(c*x))
*log(c^2*x^2 + 1))*b*e/x^2 - 1/2*a*d/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b \operatorname{atan}(c\, x))\left(d + e\, \ln\left(c^2\, x^2 + 1\right)\right)}{x^3}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^3,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^3, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\operatorname{atan}(cx))\left(d+e\log\left(c^2x^2+1\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(c**2*x**2+1))/x**3,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*log(c**2*x**2 + 1))/x**3, x)
```

3.1294 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(1+c^2x^2))}{x^4}\,dx$

Optimal. Leaf size=189

$$-\frac{c^3e\left(a+b\tan^{-1}(cx)\right)^2}{3b}-\frac{\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{3x^3}-\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{3x}+bc^3e\log(x)-\frac{bc\left(c^2x^2\right.}{}$$

```
[Out] -2/3*c^2*e*(a+b*arctan(c*x))/x-1/3*c^3*e*(a+b*arctan(c*x))^2/b+b*c^3*e*ln(x
)-1/3*b*c^3*e*ln(c^2*x^2+1)-1/6*b*c*(c^2*x^2+1)*(d+e*ln(c^2*x^2+1))/x^2-1/3
*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^3-1/6*b*c^3*(d+e*ln(c^2*x^2+1))*ln
(1-1/(c^2*x^2+1))+1/6*b*c^3*e*polylog(2,1/(c^2*x^2+1))
```

Rubi [A] time = 0.43, antiderivative size = 186, normalized size of antiderivative = 0.98, number of steps used = 17, number of rules used = 16, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.615, Rules used = {5017, 2475, 2411, 2347, 2344, 2301, 2316, 2315, 2314, 31, 4918, 4852, 266, 36, 29, 4884}

$$\frac{1}{6}bc^3e\text{PolyLog}\left(2,-c^2x^2\right)-\frac{\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{3x^3}-\frac{c^3e\left(a+b\tan^{-1}(cx)\right)^2}{3b}-\frac{2c^2e\left(a+b\tan^{-1}(c\right.}{3x}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^4,x]
```

```
[Out] (-2*c^2*e*(a + b*ArcTan[c*x]))/(3*x) - (c^3*e*(a + b*ArcTan[c*x])^2)/(3*b)
- (b*c^3*d*Log[x])/3 + b*c^3*e*Log[x] - (b*c^3*e*Log[1 + c^2*x^2])/3 - (b*c
*(1 + c^2*x^2)*(d + e*Log[1 + c^2*x^2]))/(6*x^2) - ((a + b*ArcTan[c*x])*(d
+ e*Log[1 + c^2*x^2]))/(3*x^3) + (b*c^3*(d + e*Log[1 + c^2*x^2])^2)/(12*e)
+ (b*c^3*e*PolyLog[2, -(c^2*x^2)])/6
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
```

```
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2316

```
Int[((a_.) + Log[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[
((a + b*Log[-((c*d)/e)])*Log[d + e*x])/e, x] + Dist[b, Int[Log[-((e*x)/d)]/
(d + e*x), x], x] /; FreeQ[{a, b, c, d, e}, x] && GtQ[-((c*d)/e), 0]
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 5017

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> Simp[(x^(m + 1)*(d + e*Log[f + g*x^2])*(a +
b*ArcTan[c*x]))/(m + 1), x] + (-Dist[(b*c)/(m + 1), Int[(x^(m + 1)*(d + e*L
og[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[(2*e*g)/(m + 1), Int[(x^(m + 2
)*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c, d, e, f, g},
 x] && ILtQ[m/2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x^4}\,dx = -\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{3x^3}+\frac{1}{3}(bc)\int\frac{d+e\log}{x^3\,(1}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{3x^3}+\frac{1}{6}(bc)\,\text{Subst}\left(\int\frac{d}{}\right.$$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{3x}-\frac{c^3e\left(a+b\tan^{-1}(cx)\right)^2}{3b}-\frac{\left(a+b\tan\right.}{}$$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{3x}-\frac{c^3e\left(a+b\tan^{-1}(cx)\right)^2}{3b}-\frac{\left(a+b\tan\right.}{}$$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{3x}-\frac{c^3e\left(a+b\tan^{-1}(cx)\right)^2}{3b}-\frac{bc\left(1+c^2x\right.}{}$$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{3x}-\frac{c^3e\left(a+b\tan^{-1}(cx)\right)^2}{3b}-\frac{1}{3}bc^3d\log($$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{3x}-\frac{c^3e\left(a+b\tan^{-1}(cx)\right)^2}{3b}-\frac{1}{3}bc^3d\log($$

Mathematica [A] time = 0.18, size = 181, normalized size = 0.96

$$\frac{1}{12}\left(-\frac{4c^3e\left(a+b\tan^{-1}(cx)\right)^2}{b}-\frac{4\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{x^3}-\frac{8c^2e\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{2bc\left(e\log\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^4,x]
```

```
[Out] ((-8*c^2*e*(a + b*ArcTan[c*x]))/x - (4*c^3*e*(a + b*ArcTan[c*x])^2)/b + 6*b
*c^3*e*(2*Log[x] - Log[1 + c^2*x^2]) - (2*b*c*(d + e*Log[1 + c^2*x^2]))/x^2
 - (4*(a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^3 + (b*c^3*(d + e*Log
```

```
[1 + c^2*x^2])^2)/e - 2*b*c^3*(Log[-(c^2*x^2)]*(d + e*Log[1 + c^2*x^2]) + e
*PolyLog[2, 1 + c^2*x^2]))/12
```

fricas [F] time = 0.60, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bd \arctan(cx) + ad + (be \arctan(cx) + ae)\log\left(c^2x^2+1\right)}{x^4}, x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^4,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(c^2*x^2 + 1))
/x^4, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^4,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 15.92, size = 0, normalized size = 0.00

$$\int \frac{(a + b \arctan(cx))\left(d + e \ln\left(c^2x^2+1\right)\right)}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^4,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^4,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{6}\left(\left(c^2\log\left(c^2x^2+1\right) - c^2\log\left(x^2\right) - \frac{1}{x^2}\right)c - \frac{2\arctan(cx)}{x^3}\right)bd - \frac{1}{3}\left(2\left(c\arctan(cx) + \frac{1}{x}\right)c^2 + \frac{\log\left(c^2x^2+1\right)}{x^3}\right)ae + b\cdots$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^4,x, algorithm="maxima")
```

```
[Out] 1/6*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c - 2*arctan(c*x)/x^3)*b
*d - 1/3*(2*(c*arctan(c*x) + 1/x)*c^2 + log(c^2*x^2 + 1)/x^3)*a*e + b*e*int
egrate(arctan(c*x)*log(c^2*x^2 + 1)/x^4, x) - 1/3*a*d/x^3
```

mupad [F] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a + b\,\mathrm{atan}(c\,x))\,\left(d + e\,\ln\left(c^2\,x^2+1\right)\right)}{x^4}\, dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^4,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^4, x)
```

sympy [A] time = 51.58, size = 428, normalized size = 2.26

$$-\frac{2ac^2e\,\mathrm{atan}\left(\frac{x}{\sqrt{\frac{1}{c^2}}}\right)}{3\sqrt{\frac{1}{c^2}}}-\frac{2ac^2e}{3x}-\frac{ad}{3x^3}-\frac{ae\log\left(c^2x^2+1\right)}{3x^3}-2bc^7e\left(\begin{cases}\frac{x^2}{12c^2}-\frac{\log\left(c^2x^2+1\right)}{12c^4} & \text{for } c=0\\ \frac{\log\left(c^2x^2+1\right)^2}{24c^4} & \text{otherwise}\end{cases}\right)+\frac{bc^5d\left(\begin{cases}x^2\\ \frac{\log\left(c^2x^2+\right.}{c^2}\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(c**2*x**2+1))/x**4,x)
```

```
[Out] -2*a*c**2*e*atan(x/sqrt(c**(-2)))/(3*sqrt(c**(-2))) - 2*a*c**2*e/(3*x) - a*
d/(3*x**3) - a*e*log(c**2*x**2 + 1)/(3*x**3) - 2*b*c**7*e*Piecewise((x**2/(
12*c**2) - log(c**2*x**2 + 1)/(12*c**4), Eq(c, 0)), (log(c**2*x**2 + 1)**2/
(24*c**4), True)) + b*c**5*d*Piecewise((x**2, Eq(c**2, 0)), (log(c**2*x**2
+ 1)/c**2, True))/6 + b*c**5*e*Piecewise((x**2, Eq(c**2, 0)), (log(c**2*x**
2 + 1)/c**2, True))*log(c**2*x**2 + 1)/6 - b*c**3*d*log(x**2)/6 + b*c**3*e*
log(x)/3 - b*c**3*e*log(c**2*x**2 + 1)/6 - b*c**3*e*log(6*c**2*sqrt(c**(-2)
) + 6*sqrt(c**(-2))/x**2)/3 + b*c**3*e*atan(x/sqrt(c**(-2)))**2/3 + b*c**3*
e*polylog(2, c**2*x**2*exp_polar(I*pi))/6 - 2*b*c**2*e*atan(c*x)*atan(x/sqr
t(c**(-2)))/(3*sqrt(c**(-2))) - 2*b*c**2*e*atan(c*x)/(3*x) - b*c*d/(6*x**2)
 - b*c*e*log(c**2*x**2 + 1)/(6*x**2) - b*d*atan(c*x)/(3*x**3) - b*e*log(c**
2*x**2 + 1)*atan(c*x)/(3*x**3)
```

3.1295 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(1+c^2x^2))}{x^5}\,dx$

Optimal. Leaf size=225

$$-\frac{(a+b\tan^{-1}(cx))\left(e\log\left(c^2x^2+1\right)+d\right)}{4x^4}-\frac{1}{2}ac^4e\log(x)-\frac{ac^2e}{4x^2}+\frac{1}{4}ac^4e\log\left(c^2x^2+1\right)-\frac{1}{4}ibc^4e\text{Li}_2(-icx)+\frac{1}{4}ibc^4e\text{Li}_2($$

```
[Out] -1/4*a*c^2*e/x^2-5/12*b*c^3*e/x-11/12*b*c^4*e*arctan(c*x)-1/4*b*c^2*e*arcta
n(c*x)/x^2-1/2*a*c^4*e*ln(x)+1/4*a*c^4*e*ln(c^2*x^2+1)-1/12*b*c*(d+e*ln(c^2
*x^2+1))/x^3+1/4*b*c^3*(d+e*ln(c^2*x^2+1))/x+1/4*b*c^4*arctan(c*x)*(d+e*ln(
c^2*x^2+1))-1/4*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^4-1/4*I*b*c^4*e*pol
ylog(2,-I*c*x)+1/4*I*b*c^4*e*polylog(2,I*c*x)
```

Rubi [A] time = 0.26, antiderivative size = 225, normalized size of antiderivative = 1.00, number of steps used = 15, number of rules used = 10, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.385, Rules used = {4852, 325, 203, 5021, 1802, 635, 260, 4980, 4848, 2391}

$$-\frac{1}{4}ibc^4e\text{PolyLog}(2,-icx)+\frac{1}{4}ibc^4e\text{PolyLog}(2,icx)-\frac{(a+b\tan^{-1}(cx))\left(e\log\left(c^2x^2+1\right)+d\right)}{4x^4}-\frac{ac^2e}{4x^2}+\frac{1}{4}ac^4e\log\left(c^2x\right.$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^5,x]
```

```
[Out] -(a*c^2*e)/(4*x^2) - (5*b*c^3*e)/(12*x) - (11*b*c^4*e*ArcTan[c*x])/12 - (b*
c^2*e*ArcTan[c*x])/(4*x^2) - (a*c^4*e*Log[x])/2 + (a*c^4*e*Log[1 + c^2*x^2]
)/4 - (b*c*(d + e*Log[1 + c^2*x^2]))/(12*x^3) + (b*c^3*(d + e*Log[1 + c^2*x
^2]))/(4*x) + (b*c^4*ArcTan[c*x]*(d + e*Log[1 + c^2*x^2]))/4 - ((a + b*ArcT
an[c*x])*(d + e*Log[1 + c^2*x^2]))/(4*x^4) - (I/4)*b*c^4*e*PolyLog[2, (-I)*
c*x] + (I/4)*b*c^4*e*PolyLog[2, I*c*x]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 1802

```
Int[(Pq_)*((c_.)*(x_))^(m_.)*((a_) + (b_.)*(x_)^2)^(p_.), x_Symbol] :> Int[
ExpandIntegrand[(c*x)^m*Pq*(a + b*x^2)^p, x], x] /; FreeQ[{a, b, c, m}, x]
```

```
&& PolyQ[Pq, x] && IGtQ[p, -2]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4980

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_.)*((d_) + (e_
.)*(x_)^2)^(q_.), x_Symbol] :> With[{u = ExpandIntegrand[(a + b*ArcTan[c*x]
)^p, (f*x)^m*(d + e*x^2)^q, x]}, Int[u, x] /; SumQ[u]] /; FreeQ[{a, b, c, d
, e, f, m}, x] && IntegerQ[q] && IGtQ[p, 0] && ((EqQ[p, 1] && GtQ[q, 0]) ||
 IntegerQ[m])
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x^5}\,dx = -\frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{12x^3}+\frac{bc^3\left(d+e\log\left(1+c^2x^2\right)\right)}{4x}+\frac{1}{4}bc^4\,\text{ta}$$
$$= -\frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{12x^3}+\frac{bc^3\left(d+e\log\left(1+c^2x^2\right)\right)}{4x}+\frac{1}{4}bc^4\,\text{ta}$$
$$= -\frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{12x^3}+\frac{bc^3\left(d+e\log\left(1+c^2x^2\right)\right)}{4x}+\frac{1}{4}bc^4\,\text{ta}$$
$$= -\frac{ac^2e}{4x^2}-\frac{bc^3e}{6x}-\frac{1}{2}ac^4e\log(x)-\frac{bc\left(d+e\log\left(1+c^2x^2\right)\right)}{12x^3}+\frac{bc^3\left(d\right.}{}$$
$$= -\frac{ac^2e}{4x^2}-\frac{bc^3e}{6x}-\frac{bc^2e\tan^{-1}(cx)}{4x^2}-\frac{1}{2}ac^4e\log(x)-\frac{bc\left(d+e\log\left(1\right.\right.}{12x^3}$$
$$= -\frac{ac^2e}{4x^2}-\frac{5bc^3e}{12x}-\frac{2}{3}bc^4e\tan^{-1}(cx)-\frac{bc^2e\tan^{-1}(cx)}{4x^2}-\frac{1}{2}ac^4e\log(x$$
$$= -\frac{ac^2e}{4x^2}-\frac{5bc^3e}{12x}-\frac{11}{12}bc^4e\tan^{-1}(cx)-\frac{bc^2e\tan^{-1}(cx)}{4x^2}-\frac{1}{2}ac^4e\log($$

Mathematica [A] time = 0.19, size = 260, normalized size = 1.16

$$-\frac{6ac^4ex^4\log(x)+3ac^2ex^2+3ae\log\left(c^2x^2+1\right)-3ac^4ex^4\log\left(c^2x^2+1\right)+3ad-3bc^4dx^4\tan^{-1}(cx)+3ibc^4ex^4\text{Li}}{}$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^5,x]
```

```
[Out] -1/12*(3*a*d + b*c*d*x + 3*a*c^2*e*x^2 - 3*b*c^3*d*x^3 + 5*b*c^3*e*x^3 + 3*
b*d*ArcTan[c*x] + 3*b*c^2*e*x^2*ArcTan[c*x] - 3*b*c^4*d*x^4*ArcTan[c*x] + 1
1*b*c^4*e*x^4*ArcTan[c*x] + 6*a*c^4*e*x^4*Log[x] + 3*a*e*Log[1 + c^2*x^2] +
 b*c*e*x*Log[1 + c^2*x^2] - 3*b*c^3*e*x^3*Log[1 + c^2*x^2] - 3*a*c^4*e*x^4*
Log[1 + c^2*x^2] + 3*b*e*ArcTan[c*x]*Log[1 + c^2*x^2] - 3*b*c^4*e*x^4*ArcTa
n[c*x]*Log[1 + c^2*x^2] + (3*I)*b*c^4*e*x^4*PolyLog[2, (-I)*c*x] - (3*I)*b*
c^4*e*x^4*PolyLog[2, I*c*x])/x^4
```

fricas [F] time = 0.53, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bd\arctan(cx)+ad+(be\arctan(cx)+ae)\log\left(c^2x^2+1\right)}{x^5},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^5,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(c^2*x^2 + 1))
/x^5, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^5,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 21.42, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arctan(cx))\left(d+e\ln\left(c^2x^2+1\right)\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^5,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^5,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{12}\left(\left(3\,c^3\arctan(cx)+\frac{3\,c^2x^2-1}{x^3}\right)c-\frac{3\,\arctan(cx)}{x^4}\right)bd+\frac{1}{4}\left(\left(c^2\log\left(c^2x^2+1\right)-c^2\log\left(x^2\right)-\frac{1}{x^2}\right)c^2-\frac{\log\left(c^2\right.}{x}\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^5,x, algorithm="maxima")
```

```
[Out] 1/12*((3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*c - 3*arctan(c*x)/x^4)*b*d
+ 1/4*((c^2*log(c^2*x^2 + 1) - c^2*log(x^2) - 1/x^2)*c^2 - log(c^2*x^2 + 1)
/x^4)*a*e - 1/12*(72*c^6*x^4*integrate(1/12*x*arctan(c*x)/(c^2*x^2 + 1), x)
 + 8*c^4*x^4*arctan(c*x) - 72*c^2*x^4*integrate(1/12*arctan(c*x)/(c^2*x^5 +
 x^3), x) + 2*c^3*x^3 - (3*c^3*x^3 - c*x + 3*(c^4*x^4 - 1)*arctan(c*x))*log
(c^2*x^2 + 1))*b*e/x^4 - 1/4*a*d/x^4
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))\,\left(d+e\,\ln\left(c^2\,x^2+1\right)\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^5,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^5, x)
```

sympy [F] time = 0.00, size = 0, normalized size = 0.00

$$\int \frac{(a+b\,\mathrm{atan}(cx))\left(d+e\log\left(c^2x^2+1\right)\right)}{x^5}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(c**2*x**2+1))/x**5,x)
```

```
[Out] Integral((a + b*atan(c*x))*(d + e*log(c**2*x**2 + 1))/x**5, x)
```

3.1296 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(1+c^2x^2))}{x^6}\,dx$

Optimal. Leaf size=248

$$\frac{c^5e\left(a+b\tan^{-1}(cx)\right)^2}{5b}+\frac{2c^4e\left(a+b\tan^{-1}(cx)\right)}{5x}-\frac{\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{5x^5}-\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}-$$

```
[Out] -7/60*b*c^3*e/x^2-2/15*c^2*e*(a+b*arctan(c*x))/x^3+2/5*c^4*e*(a+b*arctan(c*
x))/x+1/5*c^5*e*(a+b*arctan(c*x))^2/b-5/6*b*c^5*e*ln(x)+19/60*b*c^5*e*ln(c^
2*x^2+1)-1/20*b*c*(d+e*ln(c^2*x^2+1))/x^4+1/10*b*c^3*(c^2*x^2+1)*(d+e*ln(c^
2*x^2+1))/x^2-1/5*(a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^5+1/10*b*c^5*(d+e
*ln(c^2*x^2+1))*ln(1-1/(c^2*x^2+1))-1/10*b*c^5*e*polylog(2,1/(c^2*x^2+1))
```

Rubi [A] time = 0.63, antiderivative size = 245, normalized size of antiderivative = 0.99, number of steps used = 26, number of rules used = 18, integrand size = 26, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.692, Rules used = {5017, 2475, 2411, 2347, 2344, 2301, 2316, 2315, 2314, 31, 2319, 44, 4918, 4852, 266, 36, 29, 4884}

$$-\frac{1}{10}bc^5e\text{PolyLog}\left(2,-c^2x^2\right)-\frac{\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{5x^5}-\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}+\frac{c^5e\left(a+b\tan^{-1}(cx)\right.}{5b}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^6,x]
```

```
[Out] (-7*b*c^3*e)/(60*x^2) - (2*c^2*e*(a + b*ArcTan[c*x]))/(15*x^3) + (2*c^4*e*(
a + b*ArcTan[c*x]))/(5*x) + (c^5*e*(a + b*ArcTan[c*x])^2)/(5*b) + (b*c^5*d*
Log[x])/5 - (5*b*c^5*e*Log[x])/6 + (19*b*c^5*e*Log[1 + c^2*x^2])/60 - (b*c*
(d + e*Log[1 + c^2*x^2]))/(20*x^4) + (b*c^3*(1 + c^2*x^2)*(d + e*Log[1 + c^
2*x^2]))/(10*x^2) - ((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/(5*x^5)
- (b*c^5*(d + e*Log[1 + c^2*x^2])^2)/(20*e) - (b*c^5*e*PolyLog[2, -(c^2*x^2
)])/10
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 44

```
Int[((a_) + (b_.)*(x_))^(m_.)*((c_.) + (d_.)*(x_))^(n_.), x_Symbol] :> Int[
ExpandIntegrand[(a + b*x)^m*(c + d*x)^n, x], x] /; FreeQ[{a, b, c, d}, x] &
& NeQ[b*c - a*d, 0] && ILtQ[m, 0] && IntegerQ[n] &&  !(IGtQ[n, 0] && LtQ[m
+ n + 2, 0])
```

Rule 266

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Dist[1/n, Subst[
Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p, x], x, x^n], x] /; FreeQ[{a, b
```

```
, m, n, p}, x] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 2301

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))/(x_), x_Symbol] :> Simp[(a + b*Lo
g[c*x^n])^2/(2*b*n), x] /; FreeQ[{a, b, c, n}, x]
```

Rule 2314

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))*((d_) + (e_.)*(x_)^(r_.))^(q_), x
_Symbol] :> Simp[(x*(d + e*x^r)^(q + 1)*(a + b*Log[c*x^n]))/d, x] - Dist[(b
*n)/d, Int[(d + e*x^r)^(q + 1), x], x] /; FreeQ[{a, b, c, d, e, n, q, r}, x
] && EqQ[r*(q + 1) + 1, 0]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2316

```
Int[((a_.) + Log[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> Simp[
((a + b*Log[-((c*d)/e)])*Log[d + e*x])/e, x] + Dist[b, Int[Log[-((e*x)/d)]/
(d + e*x), x], x] /; FreeQ[{a, b, c, d, e}, x] && GtQ[-((c*d)/e), 0]
```

Rule 2319

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_.),
x_Symbol] :> Simp[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/(e*(q + 1)), x]
- Dist[(b*n*p)/(e*(q + 1)), Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^(p -
1))/x, x], x] /; FreeQ[{a, b, c, d, e, n, p, q}, x] && GtQ[p, 0] && NeQ[q,
-1] && (EqQ[p, 1] || (IntegersQ[2*p, 2*q] &&  !IGtQ[q, 0]) || (EqQ[p, 2] &&
 NeQ[q, 1]))
```

Rule 2344

```
Int[((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)/((x_)*((d_) + (e_.)*(x_))),
 x_Symbol] :> Dist[1/d, Int[(a + b*Log[c*x^n])^p/x, x], x] - Dist[e/d, Int[
(a + b*Log[c*x^n])^p/(d + e*x), x], x] /; FreeQ[{a, b, c, d, e, n}, x] && I
GtQ[p, 0]
```

Rule 2347

```
Int[(((a_.) + Log[(c_.)*(x_)^(n_.)]*(b_.))^(p_.)*((d_) + (e_.)*(x_))^(q_))/
(x_), x_Symbol] :> Dist[1/d, Int[((d + e*x)^(q + 1)*(a + b*Log[c*x^n])^p)/x
, x], x] - Dist[e/d, Int[(d + e*x)^q*(a + b*Log[c*x^n])^p, x], x] /; FreeQ[
{a, b, c, d, e, n}, x] && IGtQ[p, 0] && LtQ[q, -1] && IntegerQ[2*q]
```

Rule 2411

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_.) + (g_
.)*(x_))^(q_.)*((h_.) + (i_.)*(x_))^(r_.), x_Symbol] :> Dist[1/e, Subst[Int
[((g*x)/e)^q*((e*h - d*i)/e + (i*x)/e)^r*(a + b*Log[c*x^n])^p, x], x, d + e
*x], x] /; FreeQ[{a, b, c, d, e, f, g, h, i, n, p, q, r}, x] && EqQ[e*f - d
*g, 0] && (IGtQ[p, 0] || IGtQ[r, 0]) && IntegerQ[2*r]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4884

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)/((d_) + (e_.)*(x_)^2), x_Symbo
l] :> Simp[(a + b*ArcTan[c*x])^(p + 1)/(b*c*d*(p + 1)), x] /; FreeQ[{a, b,
c, d, e, p}, x] && EqQ[e, c^2*d] && NeQ[p, -1]
```

Rule 4918

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[1/d, Int[(f*x)^m*(a + b*ArcTan[c*x])^p, x],
x] - Dist[e/(d*f^2), Int[((f*x)^(m + 2)*(a + b*ArcTan[c*x])^p)/(d + e*x^2),
 x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && LtQ[m, -1]
```

Rule 5017

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> Simp[(x^(m + 1)*(d + e*Log[f + g*x^2])*(a +
b*ArcTan[c*x]))/(m + 1), x] + (-Dist[(b*c)/(m + 1), Int[(x^(m + 1)*(d + e*L
og[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[(2*e*g)/(m + 1), Int[(x^(m + 2
)*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c, d, e, f, g},
 x] && ILtQ[m/2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{x^6}\,dx = -\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{5x^5}+\frac{1}{5}(bc)\int \frac{d+e\log}{x^5\left(1\right.}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2x^2\right)\right)}{5x^5}+\frac{1}{10}(bc)\,\mathrm{Subst}\left(\int\right.$$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}-\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(1+c^2\right.\right.}{5x^5}$$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}+\frac{2c^4e\left(a+b\tan^{-1}(cx)\right)}{5x}+\frac{c^5e\left(a+b\right.}{}$$

$$= -\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}+\frac{2c^4e\left(a+b\tan^{-1}(cx)\right)}{5x}+\frac{c^5e\left(a+b\right.}{}$$

$$= -\frac{bc^3e}{15x^2}-\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}+\frac{2c^4e\left(a+b\tan^{-1}(cx)\right)}{5x}+\frac{c^5}{}$$

$$= -\frac{7bc^3e}{60x^2}-\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}+\frac{2c^4e\left(a+b\tan^{-1}(cx)\right)}{5x}+\frac{c}{}$$

$$= -\frac{7bc^3e}{60x^2}-\frac{2c^2e\left(a+b\tan^{-1}(cx)\right)}{15x^3}+\frac{2c^4e\left(a+b\tan^{-1}(cx)\right)}{5x}+\frac{c}{}$$

Mathematica [A] time = 0.34, size = 259, normalized size = 1.04

$$\frac{1}{60}\left(\frac{12c^5e\left(a+b\tan^{-1}(cx)\right)^2}{b}+\frac{24c^4e\left(a+b\tan^{-1}(cx)\right)}{x}-\frac{12\left(a+b\tan^{-1}(cx)\right)\left(e\log\left(c^2x^2+1\right)+d\right)}{x^5}-\frac{8c^2e\left(a\right.}{}\right.$$

Antiderivative was successfully verified.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^6,x]
```

```
[Out] ((-8*c^2*e*(a + b*ArcTan[c*x]))/x^3 + (24*c^4*e*(a + b*ArcTan[c*x]))/x + (1
2*c^5*e*(a + b*ArcTan[c*x])^2)/b - 18*b*c^5*e*(2*Log[x] - Log[1 + c^2*x^2])
 + 7*b*c^3*e*(-x^(-2) - 2*c^2*Log[x] + c^2*Log[1 + c^2*x^2]) - (3*b*c*(d +
e*Log[1 + c^2*x^2]))/x^4 + (6*b*c^3*(d + e*Log[1 + c^2*x^2]))/x^2 - (12*(a
+ b*ArcTan[c*x])*(d + e*Log[1 + c^2*x^2]))/x^5 + 6*b*c^5*Log[-(c^2*x^2)]*(d
 + e*Log[1 + c^2*x^2]) - (3*b*c^5*(d + e*Log[1 + c^2*x^2])^2)/e + 6*b*c^5*e
*PolyLog[2, 1 + c^2*x^2])/60
```

fricas [F] time = 0.49, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(\frac{bd\arctan(cx)+ad+(be\arctan(cx)+ae)\log\left(c^2x^2+1\right)}{x^6},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^6,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(c^2*x^2 + 1))
/x^6, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^6,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 25.79, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arctan(cx))\left(d+e\ln\left(c^2x^2+1\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^6,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(c^2*x^2+1))/x^6,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{20}\left(\left(2\,c^4\log\left(c^2x^2+1\right)-2\,c^4\log\left(x^2\right)-\frac{2\,c^2x^2-1}{x^4}\right)c+\frac{4\,\arctan(cx)}{x^5}\right)bd+\frac{1}{15}\left(2\left(3\,c^3\arctan(cx)+\frac{3\,c^2x^2-1}{x^3}\right)\right.$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(c^2*x^2+1))/x^6,x, algorithm="maxima")
```

```
[Out] -1/20*((2*c^4*log(c^2*x^2 + 1) - 2*c^4*log(x^2) - (2*c^2*x^2 - 1)/x^4)*c +
4*arctan(c*x)/x^5)*b*d + 1/15*(2*(3*c^3*arctan(c*x) + (3*c^2*x^2 - 1)/x^3)*
c^2 - 3*log(c^2*x^2 + 1)/x^5)*a*e + b*e*integrate(arctan(c*x)*log(c^2*x^2 +
 1)/x^6, x) - 1/5*a*d/x^5
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))\,\left(d+e\,\ln\left(c^2\,x^2+1\right)\right)}{x^6}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^6,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*log(c^2*x^2 + 1)))/x^6, x)
```

sympy [A] time = 66.85, size = 474, normalized size = 1.91

$$\frac{2ac^4e\,\mathrm{atan}\left(\frac{x}{\sqrt{\frac{1}{c^2}}}\right)}{5\sqrt{\frac{1}{c^2}}}+\frac{2ac^4e}{5x}-\frac{2ac^2e}{15x^3}-\frac{ad}{5x^5}-\frac{ae\log\left(c^2x^2+1\right)}{5x^5}+4bc^9e\left(\begin{cases}\frac{x^2}{40c^2}-\frac{\log\left(c^2x^2+1\right)}{40c^4} & \text{for } c=0\\ \frac{\log\left(c^2x^2+1\right)^2}{80c^4} & \text{otherwise}\end{cases}\right)-\frac{bc^7d\left(\begin{cases}x^2\\ \log(c\end{cases}\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(c**2*x**2+1))/x**6,x)
```

```
[Out] 2*a*c**4*e*atan(x/sqrt(c**(-2)))/(5*sqrt(c**(-2))) + 2*a*c**4*e/(5*x) - 2*a
*c**2*e/(15*x**3) - a*d/(5*x**5) - a*e*log(c**2*x**2 + 1)/(5*x**5) + 4*b*c*
*9*e*Piecewise((x**2/(40*c**2) - log(c**2*x**2 + 1)/(40*c**4), Eq(c, 0)), (
log(c**2*x**2 + 1)**2/(80*c**4), True)) - b*c**7*d*Piecewise((x**2, Eq(c**2
, 0)), (log(c**2*x**2 + 1)/c**2, True))/10 - b*c**7*e*Piecewise((x**2, Eq(c
**2, 0)), (log(c**2*x**2 + 1)/c**2, True))*log(c**2*x**2 + 1)/10 + b*c**5*d
*log(x**2)/10 - 5*b*c**5*e*log(x)/6 + 5*b*c**5*e*log(c**2*x**2 + 1)/12 - b*
c**5*e*atan(x/sqrt(c**(-2)))**2/5 - b*c**5*e*polylog(2, c**2*x**2*exp_polar
(I*pi))/10 + 2*b*c**4*e*atan(c*x)*atan(x/sqrt(c**(-2)))/(5*sqrt(c**(-2))) +
 2*b*c**4*e*atan(c*x)/(5*x) + b*c**3*d/(10*x**2) + b*c**3*e*log(c**2*x**2 +
 1)/(10*x**2) - 7*b*c**3*e/(60*x**2) - 2*b*c**2*e*atan(c*x)/(15*x**3) - b*c
*d/(20*x**4) - b*c*e*log(c**2*x**2 + 1)/(20*x**4) - b*d*atan(c*x)/(5*x**5)
- b*e*log(c**2*x**2 + 1)*atan(c*x)/(5*x**5)
```

3.1297 $\int x \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)\,dx$

Optimal. Leaf size=562

$$\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)+\frac{e\left(f+gx^2\right)\log\left(f+gx^2\right)\left(a+b\tan^{-1}(cx)\right)}{2g}-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+$$

```
[Out] -1/2*b*(d-e)*x/c+b*e*x/c+1/2*b*(d-e)*arctan(c*x)/c^2+1/2*d*x^2*(a+b*arctan(
c*x))-1/2*e*x^2*(a+b*arctan(c*x))-b*e*(c^2*f-g)*arctan(c*x)*ln(2/(1-I*c*x))
/c^2/g-1/2*b*e*x*ln(g*x^2+f)/c-1/2*b*e*(c^2*f-g)*arctan(c*x)*ln(g*x^2+f)/c^
2/g+1/2*e*(g*x^2+f)*(a+b*arctan(c*x))*ln(g*x^2+f)/g+1/2*b*e*(c^2*f-g)*arcta
n(c*x)*ln(2*c*((-f)^(1/2)-x*g^(1/2))/(1-I*c*x)/(c*(-f)^(1/2)-I*g^(1/2)))/c^
2/g+1/2*b*e*(c^2*f-g)*arctan(c*x)*ln(2*c*((-f)^(1/2)+x*g^(1/2))/(1-I*c*x)/(
c*(-f)^(1/2)+I*g^(1/2)))/c^2/g+1/2*I*b*e*(c^2*f-g)*polylog(2,1-2/(1-I*c*x))
/c^2/g-1/4*I*b*e*(c^2*f-g)*polylog(2,1-2*c*((-f)^(1/2)-x*g^(1/2))/(1-I*c*x)
/(c*(-f)^(1/2)-I*g^(1/2)))/c^2/g-1/4*I*b*e*(c^2*f-g)*polylog(2,1-2*c*((-f)^
(1/2)+x*g^(1/2))/(1-I*c*x)/(c*(-f)^(1/2)+I*g^(1/2)))/c^2/g-b*e*arctan(x*g^(
1/2)/f^(1/2))*f^(1/2)/c/g^(1/2)
```

Rubi [A] time = 0.71, antiderivative size = 562, normalized size of antiderivative = 1.00, number of steps used = 21, number of rules used = 16, integrand size = 22, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.727, Rules used = {2454, 2389, 2295, 5019, 321, 203, 2528, 2448, 205, 2470, 12, 4928, 4856, 2402, 2315, 2447}

$$\frac{ibe\left(c^2f-g\right)\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2c^2g}-\frac{ibe\left(c^2f-g\right)\text{PolyLog}\left(2,1-\frac{2c\left(\sqrt{-f}-\sqrt{g}x\right)}{(1-icx)\left(c\sqrt{-f}-i\sqrt{g}\right)}\right)}{4c^2g}-\frac{ibe\left(c^2f-g\right)\text{PolyLog}\left(2,1\right.}{4c^2g}$$

Antiderivative was successfully verified.

```
[In] Int[x*(a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]),x]
```

```
[Out] -(b*(d - e)*x)/(2*c) + (b*e*x)/c + (b*(d - e)*ArcTan[c*x])/(2*c^2) + (d*x^2
*(a + b*ArcTan[c*x]))/2 - (e*x^2*(a + b*ArcTan[c*x]))/2 - (b*e*Sqrt[f]*ArcT
an[(Sqrt[g]*x)/Sqrt[f]])/(c*Sqrt[g]) - (b*e*(c^2*f - g)*ArcTan[c*x]*Log[2/(
1 - I*c*x)])/(c^2*g) + (b*e*(c^2*f - g)*ArcTan[c*x]*Log[(2*c*(Sqrt[-f] - Sq
rt[g]*x))/((c*Sqrt[-f] - I*Sqrt[g])*(1 - I*c*x))])/(2*c^2*g) + (b*e*(c^2*f
- g)*ArcTan[c*x]*Log[(2*c*(Sqrt[-f] + Sqrt[g]*x))/((c*Sqrt[-f] + I*Sqrt[g])
*(1 - I*c*x))])/(2*c^2*g) - (b*e*x*Log[f + g*x^2])/(2*c) - (b*e*(c^2*f - g)
*ArcTan[c*x]*Log[f + g*x^2])/(2*c^2*g) + (e*(f + g*x^2)*(a + b*ArcTan[c*x])
*Log[f + g*x^2])/(2*g) + ((I/2)*b*e*(c^2*f - g)*PolyLog[2, 1 - 2/(1 - I*c*x
)])/(c^2*g) - ((I/4)*b*e*(c^2*f - g)*PolyLog[2, 1 - (2*c*(Sqrt[-f] - Sqrt[g
]*x))/((c*Sqrt[-f] - I*Sqrt[g])*(1 - I*c*x))])/(c^2*g) - ((I/4)*b*e*(c^2*f
- g)*PolyLog[2, 1 - (2*c*(Sqrt[-f] + Sqrt[g]*x))/((c*Sqrt[-f] + I*Sqrt[g])*
(1 - I*c*x))])/(c^2*g)
```

Rule 12

```
Int[(a_)*(u_), x_Symbol] :> Dist[a, Int[u, x], x] /; FreeQ[a, x] &&  !Match
Q[u, (b_)*(v_) /; FreeQ[b, x]]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 321

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[(c^(
n - 1)*(c*x)^(m - n + 1)*(a + b*x^n)^(p + 1))/(b*(m + n*p + 1)), x] - Dist[
(a*c^n*(m - n + 1))/(b*(m + n*p + 1)), Int[(c*x)^(m - n)*(a + b*x^n)^p, x],
 x] /; FreeQ[{a, b, c, p}, x] && IGtQ[n, 0] && GtQ[m, n - 1] && NeQ[m + n*p
 + 1, 0] && IntBinomialQ[a, b, c, n, m, p, x]
```

Rule 2295

```
Int[Log[(c_.)*(x_)^(n_.)], x_Symbol] :> Simp[x*Log[c*x^n], x] - Simp[n*x, x
] /; FreeQ[{c, n}, x]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2389

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.), x_Symbol] :
> Dist[1/e, Subst[Int[(a + b*Log[c*x^n])^p, x], x, d + e*x], x] /; FreeQ[{a
, b, c, d, e, n, p}, x]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 2448

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)], x_Symbol] :> Simp[x*Log[c*(d
 + e*x^n)^p], x] - Dist[e*n*p, Int[x^n/(d + e*x^n), x], x] /; FreeQ[{c, d,
e, n, p}, x]
```

Rule 2454

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*Lo
g[c*(d + e*x)^p])^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, e, m, n, p, q},
x] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0] || IGtQ[q, 0]) &&
  !(EqQ[q, 1] && ILtQ[n, 0] && IGtQ[m, 0])
```

Rule 2470

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))/((f_) + (g_.)
*(x_)^2), x_Symbol] :> With[{u = IntHide[1/(f + g*x^2), x]}, Simp[u*(a + b*
Log[c*(d + e*x^n)^p]), x] - Dist[b*e*n*p, Int[(u*x^(n - 1))/(d + e*x^n), x]
```

```
, x]] /; FreeQ[{a, b, c, d, e, f, g, n, p}, x] && IntegerQ[n]
```

Rule 2528

```
Int[((a_.) + Log[(c_.)*(RFx_)^(p_.)]*(b_.))^(n_.)*(RGx_), x_Symbol] :> With
[{u = ExpandIntegrand[(a + b*Log[c*RFx^p])^n, RGx, x]}, Int[u, x] /; SumQ[u
]] /; FreeQ[{a, b, c, p}, x] && RationalFunctionQ[RFx, x] && RationalFuncti
onQ[RGx, x] && IGtQ[n, 0]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4928

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^(m_.))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Int[ExpandIntegrand[a + b*ArcTan[c*x], x^m/(d + e*x^2), x], x]
 /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[m] &&  !(EqQ[m, 1] && NeQ[a, 0])
```

Rule 5019

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(d + e*Log[f + g*x^2])
, x]}, Dist[a + b*ArcTan[c*x], u, x] - Dist[b*c, Int[ExpandIntegrand[u/(1 +
 c^2*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IGtQ[(m + 1)/2
, 0]
```

Rubi steps

$$\int x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)dx = \frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{e\left(f+gx^2\right.}{}$$

$$=\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right)+\frac{e\left(f+gx^2\right.}{}$$

$$=-\frac{b(d-e)x}{2c}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-\frac{1}{2}ex^2\left(a+b\tan^{-1}(cx)\right.$$

$$=-\frac{b(d-e)x}{2c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-$$

$$=-\frac{b(d-e)x}{2c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(cx)\right)-$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(\right.$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(\right.$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(\right.$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(\right.$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(\right.$$

$$=-\frac{b(d-e)x}{2c}+\frac{bex}{c}+\frac{b(d-e)\tan^{-1}(cx)}{2c^2}+\frac{1}{2}dx^2\left(a+b\tan^{-1}(\right.$$

Mathematica [B] time = 8.97, size = 1140, normalized size = 2.03

$$\frac{2adgx^2c^2-2aegx^2c^2+2bdgx^2\tan^{-1}(cx)c^2-2begx^2\tan^{-1}(cx)c^2+4ibef\sin^{-1}\left(\sqrt{\frac{c^2f}{c^2f-g}}\right)\tan^{-1}\left(\frac{cgx}{\sqrt{c^2fg}}\right)c^2-4}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[x*(a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]),x]
```

```
[Out] (-2*b*c*d*g*x + 6*b*c*e*g*x + 2*a*c^2*d*g*x^2 - 2*a*c^2*e*g*x^2 + 2*b*d*g*A
rcTan[c*x] - 2*b*e*g*ArcTan[c*x] + 2*b*c^2*d*g*x^2*ArcTan[c*x] - 2*b*c^2*e*
g*x^2*ArcTan[c*x] - 4*b*c*e*Sqrt[f]*Sqrt[g]*ArcTan[(Sqrt[g]*x)/Sqrt[f]] + (
4*I)*b*c^2*e*f*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*ArcTan[(c*g*x)/Sqrt[c^2*f*
g]] - (4*I)*b*e*g*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*ArcTan[(c*g*x)/Sqrt[c^2
*f*g]] - 4*b*c^2*e*f*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 4*b*e*g*A
rcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] + 2*b*c^2*e*f*ArcSin[Sqrt[(c^2*f)
/(c^2*f - g)]]*Log[(c^2*(1 + E^((2*I)*ArcTan[c*x]))*f + (-1 + E^((2*I)*ArcT
```

```
an[c*x]))*g - 2*E^((2*I)*ArcTan[c*x])*Sqrt[c^2*f*g])/(c^2*f - g)] - 2*b*e*g
*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*Log[(c^2*(1 + E^((2*I)*ArcTan[c*x]))*f +
 (-1 + E^((2*I)*ArcTan[c*x]))*g - 2*E^((2*I)*ArcTan[c*x])*Sqrt[c^2*f*g])/(c
^2*f - g)] + 2*b*c^2*e*f*ArcTan[c*x]*Log[(c^2*(1 + E^((2*I)*ArcTan[c*x]))*f
 + (-1 + E^((2*I)*ArcTan[c*x]))*g - 2*E^((2*I)*ArcTan[c*x])*Sqrt[c^2*f*g])/
(c^2*f - g)] - 2*b*e*g*ArcTan[c*x]*Log[(c^2*(1 + E^((2*I)*ArcTan[c*x]))*f +
 (-1 + E^((2*I)*ArcTan[c*x]))*g - 2*E^((2*I)*ArcTan[c*x])*Sqrt[c^2*f*g])/(c
^2*f - g)] - 2*b*c^2*e*f*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*Log[1 + (E^((2*I
)*ArcTan[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g)] + 2*b*e*g*ArcSin
[Sqrt[(c^2*f)/(c^2*f - g)]]*Log[1 + (E^((2*I)*ArcTan[c*x])*(c^2*f + g + 2*S
qrt[c^2*f*g]))/(c^2*f - g)] + 2*b*c^2*e*f*ArcTan[c*x]*Log[1 + (E^((2*I)*Arc
Tan[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g)] - 2*b*e*g*ArcTan[c*x]
*Log[1 + (E^((2*I)*ArcTan[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g)]
 + 2*a*c^2*e*f*Log[f + g*x^2] - 2*b*c*e*g*x*Log[f + g*x^2] + 2*a*c^2*e*g*x^
2*Log[f + g*x^2] + 2*b*e*g*ArcTan[c*x]*Log[f + g*x^2] + 2*b*c^2*e*g*x^2*Arc
Tan[c*x]*Log[f + g*x^2] + (2*I)*b*e*(c^2*f - g)*PolyLog[2, -E^((2*I)*ArcTan
[c*x])] - I*b*e*(c^2*f - g)*PolyLog[2, (E^((2*I)*ArcTan[c*x])*(-(c^2*f) - g
 + 2*Sqrt[c^2*f*g]))/(c^2*f - g)] - I*b*c^2*e*f*PolyLog[2, -((E^((2*I)*ArcT
an[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g))] + I*b*e*g*PolyLog[2,
-((E^((2*I)*ArcTan[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g))])/(4*c
^2*g)
```

fricas [F] time = 0.58, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(bdx\arctan\left(cx\right) + adx + \left(bex\arctan\left(cx\right) + aex\right)\log\left(gx^2 + f\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))*(d+e*log(g*x^2+f)),x, algorithm="fricas")
```

```
[Out] integral(b*d*x*arctan(c*x) + a*d*x + (b*e*x*arctan(c*x) + a*e*x)*log(g*x^2
+ f), x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))*(d+e*log(g*x^2+f)),x, algorithm="giac")
```

```
[Out] Timed out
```

maple [C] time = 5.64, size = 21442, normalized size = 38.15

output too large to display

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a+b*arctan(c*x))*(d+e*ln(g*x^2+f)),x)
```

```
[Out] result too large to display
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\frac{1}{2}adx^2 + \frac{1}{2}\left(x^2\arctan\left(cx\right) - c\left(\frac{x}{c^2} - \frac{\arctan\left(cx\right)}{c^3}\right)\right)bd - \frac{\left(gx^2 - \left(gx^2 + f\right)\log\left(gx^2 + f\right) + f\right)ae}{2g} - \frac{\left(2cf\arctan\left(\frac{gx}{\sqrt{fg}}\right)\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*arctan(c*x))*(d+e*log(g*x^2+f)),x, algorithm="maxima")
```

```
[Out] 1/2*a*d*x^2 + 1/2*(x^2*arctan(c*x) - c*(x/c^2 - arctan(c*x)/c^3))*b*d - 1/2
*(g*x^2 - (g*x^2 + f)*log(g*x^2 + f) + f)*a*e/g - 1/2*(2*c*f*arctan(g*x/sqr
t(f*g)) + (4*c^4*g*integrate(1/2*x^3*arctan(c*x)/(c^2*g*x^2 + c^2*f), x) +
4*c^2*g*integrate(1/2*x*arctan(c*x)/(c^2*g*x^2 + c^2*f), x) - 2*c*x + (c*x
- (c^2*x^2 + 1)*arctan(c*x))*log(g*x^2 + f))*sqrt(f*g))*b*e/(sqrt(f*g)*c^2)
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int x\,\left(a+b\,\mathrm{atan}\left(c\,x\right)\right)\,\left(d+e\,\ln\left(g\,x^2+f\right)\right) \,d x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(x*(a + b*atan(c*x))*(d + e*log(f + g*x^2)),x)
```

```
[Out] int(x*(a + b*atan(c*x))*(d + e*log(f + g*x^2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate(x*(a+b*atan(c*x))*(d+e*ln(g*x**2+f)),x)
```

```
[Out] Timed out
```

3.1298 $\int \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)dx$

Optimal. Leaf size=656

$$x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)+\frac{2ae\sqrt{f}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{g}}-2aex-\frac{b\log\left(-\frac{g(c^2x^2+1)}{c^2f-g}\right)\left(d+e\log\left(f+gx^2\right)\right)}{2c}\ be$$

```
[Out] -2*a*e*x-2*b*e*x*arctan(c*x)+b*e*ln(c^2*x^2+1)/c+x*(a+b*arctan(c*x))*(d+e*l
n(g*x^2+f))-1/2*b*ln(-g*(c^2*x^2+1)/(c^2*f-g))*(d+e*ln(g*x^2+f))/c-1/2*b*e*
polylog(2,c^2*(g*x^2+f)/(c^2*f-g))/c+1/2*I*b*e*ln(1+I*c*x)*ln(c*((-f)^(1/2)
-x*g^(1/2))/(c*(-f)^(1/2)-I*g^(1/2)))*(-f)^(1/2)/g^(1/2)-1/2*I*b*e*ln(1-I*c
*x)*ln(c*((-f)^(1/2)-x*g^(1/2))/(c*(-f)^(1/2)+I*g^(1/2)))*(-f)^(1/2)/g^(1/2
)+1/2*I*b*e*ln(1-I*c*x)*ln(c*((-f)^(1/2)+x*g^(1/2))/(c*(-f)^(1/2)-I*g^(1/2)
))*(-f)^(1/2)/g^(1/2)-1/2*I*b*e*ln(1+I*c*x)*ln(c*((-f)^(1/2)+x*g^(1/2))/(c*
(-f)^(1/2)+I*g^(1/2)))*(-f)^(1/2)/g^(1/2)-1/2*I*b*e*polylog(2,(I-c*x)*g^(1/
2)/(c*(-f)^(1/2)+I*g^(1/2)))*(-f)^(1/2)/g^(1/2)-1/2*I*b*e*polylog(2,(I+c*x)
*g^(1/2)/(c*(-f)^(1/2)+I*g^(1/2)))*(-f)^(1/2)/g^(1/2)+1/2*I*b*e*polylog(2,(
1-I*c*x)*g^(1/2)/(I*c*(-f)^(1/2)+g^(1/2)))*(-f)^(1/2)/g^(1/2)+1/2*I*b*e*pol
ylog(2,(1+I*c*x)*g^(1/2)/(I*c*(-f)^(1/2)+g^(1/2)))*(-f)^(1/2)/g^(1/2)+2*a*e
*arctan(x*g^(1/2)/f^(1/2))*f^(1/2)/g^(1/2)
```

Rubi [A] time = 0.83, antiderivative size = 656, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 12, integrand size = 21, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.571, Rules used = {5009, 2475, 2394, 2393, 2391, 4916, 4846, 260, 4910, 205, 4908, 2409}

$$-\frac{be\text{PolyLog}\left(2,\frac{c^2(f+gx^2)}{c^2f-g}\right)}{2c}-\frac{ibe\sqrt{-f}\text{ PolyLog}\left(2,\frac{\sqrt{g}(-cx+i)}{c\sqrt{-f}+i\sqrt{g}}\right)}{2\sqrt{g}}+\frac{ibe\sqrt{-f}\text{ PolyLog}\left(2,\frac{\sqrt{g}(1-icx)}{\sqrt{g}+ic\sqrt{-f}}\right)}{2\sqrt{g}}+\frac{ibe\sqrt{-f}\text{ PolyLog}}{2\sqrt{g}}$$

Antiderivative was successfully verified.

```
[In] Int[(a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]),x]
```

```
[Out] -2*a*e*x - 2*b*e*x*ArcTan[c*x] + (2*a*e*Sqrt[f]*ArcTan[(Sqrt[g]*x)/Sqrt[f]]
)/Sqrt[g] + ((I/2)*b*e*Sqrt[-f]*Log[1 + I*c*x]*Log[(c*(Sqrt[-f] - Sqrt[g]*x
))/(c*Sqrt[-f] - I*Sqrt[g])])/Sqrt[g] - ((I/2)*b*e*Sqrt[-f]*Log[1 - I*c*x]*
Log[(c*(Sqrt[-f] - Sqrt[g]*x))/(c*Sqrt[-f] + I*Sqrt[g])])/Sqrt[g] + ((I/2)*
b*e*Sqrt[-f]*Log[1 - I*c*x]*Log[(c*(Sqrt[-f] + Sqrt[g]*x))/(c*Sqrt[-f] - I*
Sqrt[g])])/Sqrt[g] - ((I/2)*b*e*Sqrt[-f]*Log[1 + I*c*x]*Log[(c*(Sqrt[-f] +
Sqrt[g]*x))/(c*Sqrt[-f] + I*Sqrt[g])])/Sqrt[g] + (b*e*Log[1 + c^2*x^2])/c +
 x*(a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]) - (b*Log[-((g*(1 + c^2*x^2))/
(c^2*f - g))]*(d + e*Log[f + g*x^2]))/(2*c) - ((I/2)*b*e*Sqrt[-f]*PolyLog[2
, (Sqrt[g]*(I - c*x))/(c*Sqrt[-f] + I*Sqrt[g])])/Sqrt[g] + ((I/2)*b*e*Sqrt[
-f]*PolyLog[2, (Sqrt[g]*(1 - I*c*x))/(I*c*Sqrt[-f] + Sqrt[g])])/Sqrt[g] + (
(I/2)*b*e*Sqrt[-f]*PolyLog[2, (Sqrt[g]*(1 + I*c*x))/(I*c*Sqrt[-f] + Sqrt[g]
)])/Sqrt[g] - ((I/2)*b*e*Sqrt[-f]*PolyLog[2, (Sqrt[g]*(I + c*x))/(c*Sqrt[-f
] + I*Sqrt[g])])/Sqrt[g] - (b*e*PolyLog[2, (c^2*(f + g*x^2))/(c^2*f - g)])/
(2*c)
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4846

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.), x_Symbol] :> Simp[x*(a + b*Ar
cTan[c*x])^p, x] - Dist[b*c*p, Int[(x*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2
*x^2), x], x] /; FreeQ[{a, b, c}, x] && IGtQ[p, 0]
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rule 4916

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((f_.)*(x_))^(m_))/((d_) + (e
_.)*(x_)^2), x_Symbol] :> Dist[f^2/e, Int[(f*x)^(m - 2)*(a + b*ArcTan[c*x])
^p, x], x] - Dist[(d*f^2)/e, Int[((f*x)^(m - 2)*(a + b*ArcTan[c*x])^p)/(d +
 e*x^2), x], x] /; FreeQ[{a, b, c, d, e, f}, x] && GtQ[p, 0] && GtQ[m, 1]
```

Rule 5009

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.)), x_Symbol] :> Simp[x*(d + e*Log[f + g*x^2])*(a + b*ArcTan[c*x]), x] +
 (-Dist[b*c, Int[(x*(d + e*Log[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[2*
e*g, Int[(x^2*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c,
d, e, f, g}, x]
```

Rubi steps

$$\int \left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)\,dx = x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)-(bc)\int \frac{x\left(d+e\log\left(f\right.\right.}{1+c^2x^2}$$

$$= x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)-\frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{d+e}{1}\right.$$

$$= -2aex+x\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)-\frac{b\log\left(-\frac{g\left(1+c\right.}{c^2f}\right.}{}$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{2ae\sqrt{f}\,\tan^{-1}\left(\frac{\sqrt{g}\,x}{\sqrt{f}}\right)}{\sqrt{g}}+x\left(a+b\tan^{-1}(c\right.$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{2ae\sqrt{f}\,\tan^{-1}\left(\frac{\sqrt{g}\,x}{\sqrt{f}}\right)}{\sqrt{g}}+\frac{be\log\left(1+c^2x^2\right.}{c}$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{2ae\sqrt{f}\,\tan^{-1}\left(\frac{\sqrt{g}\,x}{\sqrt{f}}\right)}{\sqrt{g}}+\frac{be\log\left(1+c^2x^2\right.}{c}$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{2ae\sqrt{f}\,\tan^{-1}\left(\frac{\sqrt{g}\,x}{\sqrt{f}}\right)}{\sqrt{g}}+\frac{ibe\sqrt{-f}\,\log(1+}{}$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{2ae\sqrt{f}\,\tan^{-1}\left(\frac{\sqrt{g}\,x}{\sqrt{f}}\right)}{\sqrt{g}}+\frac{ibe\sqrt{-f}\,\log(1+}{}$$

$$= -2aex-2bex\tan^{-1}(cx)+\frac{2ae\sqrt{f}\,\tan^{-1}\left(\frac{\sqrt{g}\,x}{\sqrt{f}}\right)}{\sqrt{g}}+\frac{ibe\sqrt{-f}\,\log(1+}{}$$

Mathematica [B] time = 4.55, size = 1352, normalized size = 2.06

result too large to display

Antiderivative was successfully verified.

```
[In] Integrate[(a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]),x]
```

```
[Out] a*d*x - 2*a*e*x + b*d*x*ArcTan[c*x] + (2*a*e*Sqrt[f]*ArcTan[(Sqrt[g]*x)/Sqr
t[f]])/Sqrt[g] - (b*d*Log[1 + c^2*x^2])/(2*c) + a*e*x*Log[f + g*x^2] + b*e*
(x*ArcTan[c*x] - Log[1 + c^2*x^2]/(2*c))*Log[f + g*x^2] + (b*e*g*(((-Log[(-
I)/c + x] - Log[I/c + x] + Log[1 + c^2*x^2])*Log[f + g*x^2])/(2*g) + (Log[(
```

```
-I)/c + x]*Log[1 - (Sqrt[g]*((-I)/c + x))/((-I)*Sqrt[f] - (I*Sqrt[g])/c)] +
 PolyLog[2, (Sqrt[g]*((-I)/c + x))/((-I)*Sqrt[f] - (I*Sqrt[g])/c)])/(2*g) +
 (Log[(-I)/c + x]*Log[1 - (Sqrt[g]*((-I)/c + x))/(I*Sqrt[f] - (I*Sqrt[g])/c
)] + PolyLog[2, (Sqrt[g]*((-I)/c + x))/(I*Sqrt[f] - (I*Sqrt[g])/c)])/(2*g)
+ (Log[I/c + x]*Log[1 - (Sqrt[g]*(I/c + x))/((-I)*Sqrt[f] + (I*Sqrt[g])/c)]
 + PolyLog[2, (Sqrt[g]*(I/c + x))/((-I)*Sqrt[f] + (I*Sqrt[g])/c)])/(2*g) +
(Log[I/c + x]*Log[1 - (Sqrt[g]*(I/c + x))/(I*Sqrt[f] + (I*Sqrt[g])/c)] + Po
lyLog[2, (Sqrt[g]*(I/c + x))/(I*Sqrt[f] + (I*Sqrt[g])/c)])/(2*g)))/c - (b*e
*(4*c*x*ArcTan[c*x] + 4*Log[1/Sqrt[1 + c^2*x^2]] + (c^2*f*(4*ArcTan[c*x]*Ar
cTanh[Sqrt[-(c^2*f*g)]/(c*g*x)] - 2*ArcCos[(c^2*f + g)/(-(c^2*f) + g)]*ArcT
anh[(c*g*x)/Sqrt[-(c^2*f*g)]] - (ArcCos[(c^2*f + g)/(-(c^2*f) + g)] - (2*I)
*ArcTanh[(c*g*x)/Sqrt[-(c^2*f*g)]])*Log[(-2*c^2*f*(I*g + Sqrt[-(c^2*f*g)])*
(-I + c*x))/((c^2*f - g)*(c^2*f - c*Sqrt[-(c^2*f*g)]*x))] - (ArcCos[(c^2*f
+ g)/(-(c^2*f) + g)] + (2*I)*ArcTanh[(c*g*x)/Sqrt[-(c^2*f*g)]])*Log[((2*I)*
c^2*f*(g + I*Sqrt[-(c^2*f*g)])*(I + c*x))/((c^2*f - g)*(c^2*f - c*Sqrt[-(c^
2*f*g)]*x))] + (ArcCos[(c^2*f + g)/(-(c^2*f) + g)] - (2*I)*ArcTanh[Sqrt[-(c
^2*f*g)]/(c*g*x)] + (2*I)*ArcTanh[(c*g*x)/Sqrt[-(c^2*f*g)]])*Log[(Sqrt[2]*S
qrt[-(c^2*f*g)])/(E^(I*ArcTan[c*x])*Sqrt[-(c^2*f) + g]*Sqrt[-(c^2*f) - g +
(-(c^2*f) + g)*Cos[2*ArcTan[c*x]]])] + (ArcCos[(c^2*f + g)/(-(c^2*f) + g)]
+ (2*I)*ArcTanh[Sqrt[-(c^2*f*g)]/(c*g*x)] - (2*I)*ArcTanh[(c*g*x)/Sqrt[-(c^
2*f*g)]])*Log[(Sqrt[2]*E^(I*ArcTan[c*x])*Sqrt[-(c^2*f*g)])/(Sqrt[-(c^2*f) +
 g]*Sqrt[-(c^2*f) - g + (-(c^2*f) + g)*Cos[2*ArcTan[c*x]]])] + I*(-PolyLog[
2, ((c^2*f + g - (2*I)*Sqrt[-(c^2*f*g)])*(c^2*f + c*Sqrt[-(c^2*f*g)]*x))/((
c^2*f - g)*(c^2*f - c*Sqrt[-(c^2*f*g)]*x))] + PolyLog[2, ((c^2*f + g + (2*I
)*Sqrt[-(c^2*f*g)])*(c^2*f + c*Sqrt[-(c^2*f*g)]*x))/((c^2*f - g)*(c^2*f - c
*Sqrt[-(c^2*f*g)]*x))])))/Sqrt[-(c^2*f*g)]))/(2*c)
```

fricas [F] time = 0.43, size = 0, normalized size = 0.00

$$\mathrm{integral}\left(bd\arctan(cx) + ad + (be\arctan(cx) + ae)\log\left(gx^2+f\right), x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f)),x, algorithm="fricas")
```

```
[Out] integral(b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(g*x^2 + f), x)
```

giac [F] time = 0.00, size = 0, normalized size = 0.00

$$sage_0x$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f)),x, algorithm="giac")
```

```
[Out] sage0*x
```

maple [F] time = 7.99, size = 0, normalized size = 0.00

$$\int (a + b\arctan(cx))\left(d + e\ln\left(g\,x^2+f\right)\right) dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f)),x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f)),x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$\left(2g\left(\frac{f\arctan\left(\frac{gx}{\sqrt{fg}}\right)}{\sqrt{fg}\,g} - \frac{x}{g}\right) + x\log\left(gx^2+f\right)\right)ae + adx + be\int \arctan(cx)\log\left(gx^2+f\right)dx + \frac{(2\,cx\arctan(cx) - \cdots}{2\,c\cdots}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f)),x, algorithm="maxima")
```

```
[Out] (2*g*(f*arctan(g*x/sqrt(f*g))/(sqrt(f*g)*g) - x/g) + x*log(g*x^2 + f))*a*e
+ a*d*x + b*e*integrate(arctan(c*x)*log(g*x^2 + f), x) + 1/2*(2*c*x*arctan(
c*x) - log(c^2*x^2 + 1))*b*d/c
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int (a + b\,\mathrm{atan}\,(c\,x))\,\left(d + e\,\ln\left(g\,x^2 + f\right)\right)\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a + b*atan(c*x))*(d + e*log(f + g*x^2)),x)
```

```
[Out] int((a + b*atan(c*x))*(d + e*log(f + g*x^2)), x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(g*x**2+f)),x)
```

```
[Out] Timed out
```

3.1299 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(f+gx^2))}{x}\,dx$

Optimal. Leaf size=102

$$be\text{Int}\left(\frac{\tan^{-1}(cx)\log\left(f+gx^2\right)}{x},x\right)+ad\log(x)+\frac{1}{2}ae\text{Li}_2\left(\frac{gx^2}{f}+1\right)+\frac{1}{2}ae\log\left(-\frac{gx^2}{f}\right)\log\left(f+gx^2\right)+\frac{1}{2}ibd\text{Li}_2(-ic$$

```
[Out] b*e*CannotIntegrate(arctan(c*x)*ln(g*x^2+f)/x,x)+a*d*ln(x)+1/2*a*e*ln(-g*x^
2/f)*ln(g*x^2+f)+1/2*I*b*d*polylog(2,-I*c*x)-1/2*I*b*d*polylog(2,I*c*x)+1/2
*a*e*polylog(2,1+g*x^2/f)
```

Rubi [A] time = 0.28, antiderivative size = 0, normalized size of antiderivative = 0.00, number of steps used = 0, number of rules used = 0, integrand size = 0, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.000, Rules used = {}

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x,x]
```

```
[Out] a*d*Log[x] + (a*e*Log[-((g*x^2)/f)]*Log[f + g*x^2])/2 + (I/2)*b*d*PolyLog[2
, (-I)*c*x] - (I/2)*b*d*PolyLog[2, I*c*x] + (a*e*PolyLog[2, 1 + (g*x^2)/f])
/2 + b*e*Defer[Int][(ArcTan[c*x]*Log[f + g*x^2])/x, x]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x}\,dx = d\int \frac{a+b\tan^{-1}(cx)}{x}\,dx+e\int \frac{\left(a+b\tan^{-1}(cx)\right)\log\left(f+gx^2\right)}{x}$$

$$= ad\log(x)+\frac{1}{2}(ibd)\int \frac{\log(1-icx)}{x}\,dx-\frac{1}{2}(ibd)\int \frac{\log(1+icx)}{x}$$

$$= ad\log(x)+\frac{1}{2}ibd\text{Li}_2(-icx)-\frac{1}{2}ibd\text{Li}_2(icx)+\frac{1}{2}(ae)\,\text{Subst}\left(\int \frac{l}{}\right.$$

$$= ad\log(x)+\frac{1}{2}ae\log\left(-\frac{gx^2}{f}\right)\log\left(f+gx^2\right)+\frac{1}{2}ibd\text{Li}_2(-icx)-$$

$$= ad\log(x)+\frac{1}{2}ae\log\left(-\frac{gx^2}{f}\right)\log\left(f+gx^2\right)+\frac{1}{2}ibd\text{Li}_2(-icx)-$$

Mathematica [A] time = 0.27, size = 0, normalized size = 0.00

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x}\,dx$$

Verification is Not applicable to the result.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x,x]
```

```
[Out] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x, x]
```

fricas [A] time = 0.61, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bd\arctan(cx)+ad+(be\arctan(cx)+ae)\log\left(gx^2+f\right)}{x},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(g*x^2 + f))/x
, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [A] time = 3.47, size = 0, normalized size = 0.00

$$\int \frac{(a+b\arctan(cx))\left(d+e\ln\left(g\,x^2+f\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x,x)
```

maxima [A] time = 0.00, size = 0, normalized size = 0.00

$$ad\log(x)+\frac{1}{2}\int\frac{2\left(bd\arctan(cx)+(be\arctan(cx)+ae)\log\left(gx^2+f\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x,x, algorithm="maxima")
```

```
[Out] a*d*log(x) + 1/2*integrate(2*(b*d*arctan(c*x) + (b*e*arctan(c*x) + a*e)*log
(g*x^2 + f))/x, x)
```

mupad [A] time = 0.00, size = -1, normalized size = -0.01

$$\int \frac{(a+b\,\mathrm{atan}(c\,x))\,\left(d+e\,\ln\left(g\,x^2+f\right)\right)}{x}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(f + g*x^2)))/x,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*log(f + g*x^2)))/x, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(g*x**2+f))/x,x)
```

```
[Out] Timed out
```

3.1300 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(f+gx^2))}{x^2}\,dx$

Optimal. Leaf size=672

$$-\frac{(a+b\tan^{-1}(cx))\left(d+e\log\left(f+gx^2\right)\right)}{x}+\frac{2ae\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}}-\frac{1}{2}bc\log\left(-\frac{g\left(c^2x^2+1\right)}{c^2f-g}\right)\left(d+e\log\left(f+gx^2\right)\right)$$

```
[Out] -(a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x+1/2*b*c*ln(-g*x^2/f)*(d+e*ln(g*x^2+f
))-1/2*b*c*ln(-g*(c^2*x^2+1)/(c^2*f-g))*(d+e*ln(g*x^2+f))-1/2*b*c*e*polylog
(2,c^2*(g*x^2+f)/(c^2*f-g))+1/2*b*c*e*polylog(2,1+g*x^2/f)-1/2*I*b*e*ln(1+I
*c*x)*ln(c*((-f)^(1/2)-x*g^(1/2))/(c*(-f)^(1/2)-I*g^(1/2)))*g^(1/2)/(-f)^(1
/2)+1/2*I*b*e*ln(1-I*c*x)*ln(c*((-f)^(1/2)-x*g^(1/2))/(c*(-f)^(1/2)+I*g^(1/
2)))*g^(1/2)/(-f)^(1/2)-1/2*I*b*e*ln(1-I*c*x)*ln(c*((-f)^(1/2)+x*g^(1/2))/(
c*(-f)^(1/2)-I*g^(1/2)))*g^(1/2)/(-f)^(1/2)+1/2*I*b*e*ln(1+I*c*x)*ln(c*((-f
)^(1/2)+x*g^(1/2))/(c*(-f)^(1/2)+I*g^(1/2)))*g^(1/2)/(-f)^(1/2)+1/2*I*b*e*p
olylog(2,(I-c*x)*g^(1/2)/(c*(-f)^(1/2)+I*g^(1/2)))*g^(1/2)/(-f)^(1/2)+1/2*I
*b*e*polylog(2,(I+c*x)*g^(1/2)/(c*(-f)^(1/2)+I*g^(1/2)))*g^(1/2)/(-f)^(1/2)
-1/2*I*b*e*polylog(2,(1-I*c*x)*g^(1/2)/(I*c*(-f)^(1/2)+g^(1/2)))*g^(1/2)/(-
f)^(1/2)-1/2*I*b*e*polylog(2,(1+I*c*x)*g^(1/2)/(I*c*(-f)^(1/2)+g^(1/2)))*g^
(1/2)/(-f)^(1/2)+2*a*e*arctan(x*g^(1/2)/f^(1/2))*g^(1/2)/f^(1/2)
```

Rubi [A] time = 0.76, antiderivative size = 672, normalized size of antiderivative = 1.00, number of steps used = 28, number of rules used = 14, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.583, Rules used = {5017, 2475, 36, 29, 31, 2416, 2394, 2315, 2393, 2391, 4910, 205, 4908, 2409}

$$-\frac{1}{2}bce\text{PolyLog}\left(2,\frac{c^2\left(f+gx^2\right)}{c^2f-g}\right)+\frac{1}{2}bce\text{PolyLog}\left(2,\frac{gx^2}{f}+1\right)+\frac{ibe\sqrt{g}\,\text{PolyLog}\left(2,\frac{\sqrt{g}(-cx+i)}{c\sqrt{-f}+i\sqrt{g}}\right)}{2\sqrt{-f}}-\frac{ibe\sqrt{g}\,\text{PolyLog}}{2\sqrt{}}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x^2,x]
```

```
[Out] (2*a*e*Sqrt[g]*ArcTan[(Sqrt[g]*x)/Sqrt[f]])/Sqrt[f] - ((I/2)*b*e*Sqrt[g]*Lo
g[1 + I*c*x]*Log[(c*(Sqrt[-f] - Sqrt[g]*x))/(c*Sqrt[-f] - I*Sqrt[g])])/Sqrt
[-f] + ((I/2)*b*e*Sqrt[g]*Log[1 - I*c*x]*Log[(c*(Sqrt[-f] - Sqrt[g]*x))/(c*
Sqrt[-f] + I*Sqrt[g])])/Sqrt[-f] - ((I/2)*b*e*Sqrt[g]*Log[1 - I*c*x]*Log[(c
*(Sqrt[-f] + Sqrt[g]*x))/(c*Sqrt[-f] - I*Sqrt[g])])/Sqrt[-f] + ((I/2)*b*e*S
qrt[g]*Log[1 + I*c*x]*Log[(c*(Sqrt[-f] + Sqrt[g]*x))/(c*Sqrt[-f] + I*Sqrt[g
])])/Sqrt[-f] - ((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x + (b*c*Log[-
((g*x^2)/f)]*(d + e*Log[f + g*x^2]))/2 - (b*c*Log[-((g*(1 + c^2*x^2))/(c^2*
f - g))]*(d + e*Log[f + g*x^2]))/2 + ((I/2)*b*e*Sqrt[g]*PolyLog[2, (Sqrt[g]
*(I - c*x))/(c*Sqrt[-f] + I*Sqrt[g])])/Sqrt[-f] - ((I/2)*b*e*Sqrt[g]*PolyLo
g[2, (Sqrt[g]*(1 - I*c*x))/(I*c*Sqrt[-f] + Sqrt[g])])/Sqrt[-f] - ((I/2)*b*e
*Sqrt[g]*PolyLog[2, (Sqrt[g]*(1 + I*c*x))/(I*c*Sqrt[-f] + Sqrt[g])])/Sqrt[-
f] + ((I/2)*b*e*Sqrt[g]*PolyLog[2, (Sqrt[g]*(I + c*x))/(c*Sqrt[-f] + I*Sqrt
[g])])/Sqrt[-f] - (b*c*e*PolyLog[2, (c^2*(f + g*x^2))/(c^2*f - g)])/2 + (b*
c*e*PolyLog[2, 1 + (g*x^2)/f])/2
```

Rule 29

```
Int[(x_)^(-1), x_Symbol] :> Simp[Log[x], x]
```

Rule 31

```
Int[((a_) + (b_.)*(x_))^(-1), x_Symbol] :> Simp[Log[RemoveContent[a + b*x,
x]]/b, x] /; FreeQ[{a, b}, x]
```

Rule 36

```
Int[1/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))), x_Symbol] :> Dist[b/(b*c
 - a*d), Int[1/(a + b*x), x], x] - Dist[d/(b*c - a*d), Int[1/(c + d*x), x],
 x] /; FreeQ[{a, b, c, d}, x] && NeQ[b*c - a*d, 0]
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2393

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))]*(b_.))/((f_.) + (g_.)*(x_)), x_
Symbol] :> Dist[1/g, Subst[Int[(a + b*Log[1 + (c*e*x)/g])/x, x], x, f + g*x
], x] /; FreeQ[{a, b, c, d, e, f, g}, x] && NeQ[e*f - d*g, 0] && EqQ[g + c*
(e*f - d*g), 0]
```

Rule 2394

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))/((f_.) + (g_.)*(x_
)), x_Symbol] :> Simp[(Log[(e*(f + g*x))/(e*f - d*g)]*(a + b*Log[c*(d + e*x
)^n]))/g, x] - Dist[(b*e*n)/g, Int[Log[(e*(f + g*x))/(e*f - d*g)]/(d + e*x)
, x], x] /; FreeQ[{a, b, c, d, e, f, g, n}, x] && NeQ[e*f - d*g, 0]
```

Rule 2409

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((f_) + (g_.
)*(x_)^(r_))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a + b*Log[c*(d + e*x)
^n])^p, (f + g*x^r)^q, x], x] /; FreeQ[{a, b, c, d, e, f, g, n, r}, x] && I
GtQ[p, 0] && IntegerQ[q] && (GtQ[q, 0] || (IntegerQ[r] && NeQ[r, 1]))
```

Rule 2416

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_))^(n_.)]*(b_.))^(p_.)*((h_.)*(x_))
^(m_.)*((f_) + (g_.)*(x_)^(r_.))^(q_.), x_Symbol] :> Int[ExpandIntegrand[(a
 + b*Log[c*(d + e*x)^n])^p, (h*x)^m*(f + g*x^r)^q, x], x] /; FreeQ[{a, b, c
, d, e, f, g, h, m, n, p, q, r}, x] && IntegerQ[m] && IntegerQ[q]
```

Rule 2475

```
Int[((a_.) + Log[(c_.)*((d_) + (e_.)*(x_)^(n_))^(p_.)]*(b_.))^(q_.)*(x_)^(m
_.)*((f_) + (g_.)*(x_)^(s_))^(r_.), x_Symbol] :> Dist[1/n, Subst[Int[x^(Sim
plify[(m + 1)/n] - 1)*(f + g*x^(s/n))^r*(a + b*Log[c*(d + e*x)^p])^q, x], x
, x^n], x] /; FreeQ[{a, b, c, d, e, f, g, m, n, p, q, r, s}, x] && IntegerQ
[r] && IntegerQ[s/n] && IntegerQ[Simplify[(m + 1)/n]] && (GtQ[(m + 1)/n, 0]
 || IGtQ[q, 0])
```

Rule 4908

```
Int[ArcTan[(c_.)*(x_)]/((d_.) + (e_.)*(x_)^2), x_Symbol] :> Dist[I/2, Int[L
og[1 - I*c*x]/(d + e*x^2), x], x] - Dist[I/2, Int[Log[1 + I*c*x]/(d + e*x^2
), x], x] /; FreeQ[{c, d, e}, x]
```

Rule 4910

```
Int[(ArcTan[(c_.)*(x_)]*(b_.) + (a_))/((d_.) + (e_.)*(x_)^2), x_Symbol] :>
Dist[a, Int[1/(d + e*x^2), x], x] + Dist[b, Int[ArcTan[c*x]/(d + e*x^2), x]
, x] /; FreeQ[{a, b, c, d, e}, x]
```

Rule 5017

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> Simp[(x^(m + 1)*(d + e*Log[f + g*x^2])*(a +
b*ArcTan[c*x]))/(m + 1), x] + (-Dist[(b*c)/(m + 1), Int[(x^(m + 1)*(d + e*L
og[f + g*x^2]))/(1 + c^2*x^2), x], x] - Dist[(2*e*g)/(m + 1), Int[(x^(m + 2
)*(a + b*ArcTan[c*x]))/(f + g*x^2), x], x]) /; FreeQ[{a, b, c, d, e, f, g},
 x] && ILtQ[m/2, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x^2}\,dx = -\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x} + (bc)\int \frac{d+e\log\left(f\right.}{x\left(1+c\right.}$$

$$= -\frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x} + \frac{1}{2}(bc)\,\text{Subst}\left(\int \frac{d}{}\right.$$

$$= \frac{2ae\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x}$$

$$= \frac{2ae\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x}$$

$$= \frac{2ae\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} - \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x}$$

$$= \frac{2ae\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} - \frac{ibe\sqrt{g}\log(1+icx)\log\left(\frac{c\left(\sqrt{-f}-\sqrt{g}x\right)}{c\sqrt{-f}-i\sqrt{g}}\right)}{2\sqrt{-f}} +$$

$$= \frac{2ae\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} - \frac{ibe\sqrt{g}\log(1+icx)\log\left(\frac{c\left(\sqrt{-f}-\sqrt{g}x\right)}{c\sqrt{-f}-i\sqrt{g}}\right)}{2\sqrt{-f}} +$$

$$= \frac{2ae\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} - \frac{ibe\sqrt{g}\log(1+icx)\log\left(\frac{c\left(\sqrt{-f}-\sqrt{g}x\right)}{c\sqrt{-f}-i\sqrt{g}}\right)}{2\sqrt{-f}} +$$

Mathematica [A] time = 1.12, size = 552, normalized size = 0.82

$$\frac{1}{2}\left(-\frac{2\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x}+\frac{e\sqrt{g}\left(4a\sqrt{-f}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)+ib\sqrt{f}\left(\text{Li}_2\left(\frac{\sqrt{g}(i-cx)}{\sqrt{-f}c+i\sqrt{g}}\right)+\log(1+ic\right.\right.}{}\right.$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x^2,x]
```

```
[Out] ((-2*(a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x + (e*Sqrt[g]*(4*a*Sqrt[-
f]*ArcTan[(Sqrt[g]*x)/Sqrt[f]] + I*b*Sqrt[f]*(Log[1 + I*c*x]*Log[(c*(Sqrt[-
f] + Sqrt[g]*x))/(c*Sqrt[-f] + I*Sqrt[g])] + PolyLog[2, (Sqrt[g]*(I - c*x))
/(c*Sqrt[-f] + I*Sqrt[g])]) - I*b*Sqrt[f]*(Log[1 - I*c*x]*Log[(c*(Sqrt[-f]
+ Sqrt[g]*x))/(c*Sqrt[-f] - I*Sqrt[g])] + PolyLog[2, (Sqrt[g]*(1 - I*c*x))/
(I*c*Sqrt[-f] + Sqrt[g])]) - I*b*Sqrt[f]*(Log[1 + I*c*x]*Log[(c*(Sqrt[-f] -
 Sqrt[g]*x))/(c*Sqrt[-f] - I*Sqrt[g])] + PolyLog[2, (Sqrt[g]*(1 + I*c*x))/(
I*c*Sqrt[-f] + Sqrt[g])]) + I*b*Sqrt[f]*(Log[1 - I*c*x]*Log[(c*(Sqrt[-f] -
Sqrt[g]*x))/(c*Sqrt[-f] + I*Sqrt[g])] + PolyLog[2, (Sqrt[g]*(I + c*x))/(c*S
qrt[-f] + I*Sqrt[g])])))/Sqrt[-f^2] + b*c*((Log[-((g*x^2)/f)] - Log[-((g*(1
 + c^2*x^2))/(c^2*f - g))])*(d + e*Log[f + g*x^2]) - e*PolyLog[2, (c^2*(f +
 g*x^2))/(c^2*f - g)] + e*PolyLog[2, 1 + (g*x^2)/f]))/2
```

fricas [F] time = 0.45, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bd\arctan(cx)+ad+(be\arctan(cx)+ae)\log\left(gx^2+f\right)}{x^2},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x^2,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(g*x^2 + f))/x
^2, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x^2,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 5.37, size = 0, normalized size = 0.00

$$\int\frac{(a+b\arctan(cx))\left(d+e\ln\left(g\,x^2+f\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x^2,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x^2,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(c\left(\log\left(c^2x^2+1\right)-\log\left(x^2\right)\right)+\frac{2\arctan(cx)}{x}\right)bd+\left(\frac{2g\arctan\left(\frac{gx}{\sqrt{fg}}\right)}{\sqrt{fg}}-\frac{\log\left(gx^2+f\right)}{x}\right)ae+be\int\frac{\arctan(cx)\,\mathrm{l}}{x}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x^2,x, algorithm="maxima")
```

```
[Out] -1/2*(c*(log(c^2*x^2 + 1) - log(x^2)) + 2*arctan(c*x)/x)*b*d + (2*g*arctan(
g*x/sqrt(f*g))/sqrt(f*g) - log(g*x^2 + f)/x)*a*e + b*e*integrate(arctan(c*x
)*log(g*x^2 + f)/x^2, x) - a*d/x
```

mupad [**F**] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))\,\left(d + e\,\ln\left(g\,x^2 + f\right)\right)}{x^2}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(f + g*x^2)))/x^2,x)
```

```
[Out] int(((a + b*atan(c*x))*(d + e*log(f + g*x^2)))/x^2, x)
```

sympy [**F(-1)**] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(g*x**2+f))/x**2,x)
```

```
[Out] Timed out
```

3.1301 $\int \frac{(a+b\tan^{-1}(cx))(d+e\log(f+gx^2))}{x^3}\,dx$

Optimal. Leaf size=528

$$-\frac{(a+b\tan^{-1}(cx))(d+e\log(f+gx^2))}{2x^2}-\frac{aeg\log(f+gx^2)}{2f}+\frac{aeg\log(x)}{f}-\frac{1}{2}bc^2\tan^{-1}(cx)(d+e\log(f+gx^2))+-$$

```
[Out] a*e*g*ln(x)/f-b*e*(c^2*f-g)*arctan(c*x)*ln(2/(1-I*c*x))/f-1/2*a*e*g*ln(g*x^
2+f)/f-1/2*b*c*(d+e*ln(g*x^2+f))/x-1/2*b*c^2*arctan(c*x)*(d+e*ln(g*x^2+f))-
1/2*(a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x^2+1/2*b*e*(c^2*f-g)*arctan(c*x)*l
n(2*c*((-f)^(1/2)-x*g^(1/2))/(1-I*c*x)/(c*(-f)^(1/2)-I*g^(1/2)))/f+1/2*b*e*
(c^2*f-g)*arctan(c*x)*ln(2*c*((-f)^(1/2)+x*g^(1/2))/(1-I*c*x)/(c*(-f)^(1/2)
+I*g^(1/2)))/f+1/2*I*b*e*g*polylog(2,-I*c*x)/f-1/2*I*b*e*g*polylog(2,I*c*x)
/f+1/2*I*b*e*(c^2*f-g)*polylog(2,1-2/(1-I*c*x))/f-1/4*I*b*e*(c^2*f-g)*polyl
og(2,1-2*c*((-f)^(1/2)-x*g^(1/2))/(1-I*c*x)/(c*(-f)^(1/2)-I*g^(1/2)))/f-1/4
*I*b*e*(c^2*f-g)*polylog(2,1-2*c*((-f)^(1/2)+x*g^(1/2))/(1-I*c*x)/(c*(-f)^(
1/2)+I*g^(1/2)))/f+b*c*e*arctan(x*g^(1/2)/f^(1/2))*g^(1/2)/f^(1/2)
```

Rubi [A] time = 0.77, antiderivative size = 528, normalized size of antiderivative = 1.00, number of steps used = 22, number of rules used = 18, integrand size = 24, $\frac{\text{number of rules}}{\text{integrand size}}$ = 0.750, Rules used = {4852, 325, 203, 5021, 801, 635, 205, 260, 446, 72, 6725, 4848, 2391, 4928, 4856, 2402, 2315, 2447}

$$\frac{ibe(c^2f-g)\,\text{PolyLog}\left(2,1-\frac{2}{1-icx}\right)}{2f}-\frac{ibe(c^2f-g)\,\text{PolyLog}\left(2,1-\frac{2c(\sqrt{-f}-\sqrt{g}x)}{(1-icx)(c\sqrt{-f}-i\sqrt{g})}\right)}{4f}-\frac{ibe(c^2f-g)\,\text{PolyLog}(2,1}{4f}$$

Antiderivative was successfully verified.

```
[In] Int[((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x^3,x]
```

```
[Out] (b*c*e*Sqrt[g]*ArcTan[(Sqrt[g]*x)/Sqrt[f]])/Sqrt[f] + (a*e*g*Log[x])/f - (b
*e*(c^2*f - g)*ArcTan[c*x]*Log[2/(1 - I*c*x)])/f + (b*e*(c^2*f - g)*ArcTan[
c*x]*Log[(2*c*(Sqrt[-f] - Sqrt[g]*x))/((c*Sqrt[-f] - I*Sqrt[g])*(1 - I*c*x)
)])/(2*f) + (b*e*(c^2*f - g)*ArcTan[c*x]*Log[(2*c*(Sqrt[-f] + Sqrt[g]*x))/(
(c*Sqrt[-f] + I*Sqrt[g])*(1 - I*c*x))])/(2*f) - (a*e*g*Log[f + g*x^2])/(2*f
) - (b*c*(d + e*Log[f + g*x^2]))/(2*x) - (b*c^2*ArcTan[c*x]*(d + e*Log[f +
g*x^2]))/2 - ((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/(2*x^2) + ((I/2)*
b*e*g*PolyLog[2, (-I)*c*x])/f - ((I/2)*b*e*g*PolyLog[2, I*c*x])/f + ((I/2)*
b*e*(c^2*f - g)*PolyLog[2, 1 - 2/(1 - I*c*x)])/f - ((I/4)*b*e*(c^2*f - g)*P
olyLog[2, 1 - (2*c*(Sqrt[-f] - Sqrt[g]*x))/((c*Sqrt[-f] - I*Sqrt[g])*(1 - I
*c*x))])/f - ((I/4)*b*e*(c^2*f - g)*PolyLog[2, 1 - (2*c*(Sqrt[-f] + Sqrt[g]
*x))/((c*Sqrt[-f] + I*Sqrt[g])*(1 - I*c*x))])/f
```

Rule 72

```
Int[((e_.) + (f_.)*(x_))^(p_.)/(((a_.) + (b_.)*(x_))*((c_.) + (d_.)*(x_))),
 x_Symbol] :> Int[ExpandIntegrand[(e + f*x)^p/((a + b*x)*(c + d*x)), x], x]
 /; FreeQ[{a, b, c, d, e, f}, x] && IntegerQ[p]
```

Rule 203

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(1*ArcTan[(Rt[b, 2]*x)/Rt
[a, 2]])/(Rt[a, 2]*Rt[b, 2]), x] /; FreeQ[{a, b}, x] && PosQ[a/b] && (GtQ[a
, 0] || GtQ[b, 0])
```

Rule 205

```
Int[((a_) + (b_.)*(x_)^2)^(-1), x_Symbol] :> Simp[(Rt[a/b, 2]*ArcTan[x/Rt[a
/b, 2]])/a, x] /; FreeQ[{a, b}, x] && PosQ[a/b]
```

Rule 260

```
Int[(x_)^(m_.)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> Simp[Log[RemoveConten
t[a + b*x^n, x]]/(b*n), x] /; FreeQ[{a, b, m, n}, x] && EqQ[m, n - 1]
```

Rule 325

```
Int[((c_.)*(x_))^(m_)*((a_) + (b_.)*(x_)^(n_))^(p_), x_Symbol] :> Simp[((c*
x)^(m + 1)*(a + b*x^n)^(p + 1))/(a*c*(m + 1)), x] - Dist[(b*(m + n*(p + 1)
+ 1))/(a*c^n*(m + 1)), Int[(c*x)^(m + n)*(a + b*x^n)^p, x], x] /; FreeQ[{a,
 b, c, p}, x] && IGtQ[n, 0] && LtQ[m, -1] && IntBinomialQ[a, b, c, n, m, p,
 x]
```

Rule 446

```
Int[(x_)^(m_.)*((a_) + (b_.)*(x_)^(n_))^(p_.)*((c_) + (d_.)*(x_)^(n_))^(q_.
), x_Symbol] :> Dist[1/n, Subst[Int[x^(Simplify[(m + 1)/n] - 1)*(a + b*x)^p
*(c + d*x)^q, x], x, x^n], x] /; FreeQ[{a, b, c, d, m, n, p, q}, x] && NeQ[
b*c - a*d, 0] && IntegerQ[Simplify[(m + 1)/n]]
```

Rule 635

```
Int[((d_) + (e_.)*(x_))/((a_) + (c_.)*(x_)^2), x_Symbol] :> Dist[d, Int[1/(
a + c*x^2), x], x] + Dist[e, Int[x/(a + c*x^2), x], x] /; FreeQ[{a, c, d, e
}, x] &&  !NiceSqrtQ[-(a*c)]
```

Rule 801

```
Int[(((d_.) + (e_.)*(x_))^(m_)*((f_.) + (g_.)*(x_)))/((a_) + (c_.)*(x_)^2),
 x_Symbol] :> Int[ExpandIntegrand[((d + e*x)^m*(f + g*x))/(a + c*x^2), x],
x] /; FreeQ[{a, c, d, e, f, g}, x] && NeQ[c*d^2 + a*e^2, 0] && IntegerQ[m]
```

Rule 2315

```
Int[Log[(c_.)*(x_)]/((d_) + (e_.)*(x_)), x_Symbol] :> -Simp[PolyLog[2, 1 -
c*x]/e, x] /; FreeQ[{c, d, e}, x] && EqQ[e + c*d, 0]
```

Rule 2391

```
Int[Log[(c_.)*((d_) + (e_.)*(x_)^(n_.))]/(x_), x_Symbol] :> -Simp[PolyLog[2
, -(c*e*x^n)]/n, x] /; FreeQ[{c, d, e, n}, x] && EqQ[c*d, 1]
```

Rule 2402

```
Int[Log[(c_.)/((d_) + (e_.)*(x_))]/((f_) + (g_.)*(x_)^2), x_Symbol] :> -Dis
t[e/g, Subst[Int[Log[2*d*x]/(1 - 2*d*x), x], x, 1/(d + e*x)], x] /; FreeQ[{
c, d, e, f, g}, x] && EqQ[c, 2*d] && EqQ[e^2*f + d^2*g, 0]
```

Rule 2447

```
Int[Log[u_]*(Pq_)^(m_.), x_Symbol] :> With[{C = FullSimplify[(Pq^m*(1 - u))
/D[u, x]]}, Simp[C*PolyLog[2, 1 - u], x] /; FreeQ[C, x]] /; IntegerQ[m] &&
PolyQ[Pq, x] && RationalFunctionQ[u, x] && LeQ[RationalFunctionExponents[u,
 x][[2]], Expon[Pq, x]]
```

Rule 4848

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/(x_), x_Symbol] :> Simp[a*Log[x], x]
 + (Dist[(I*b)/2, Int[Log[1 - I*c*x]/x, x], x] - Dist[(I*b)/2, Int[Log[1 +
I*c*x]/x, x], x]) /; FreeQ[{a, b, c}, x]
```

Rule 4852

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))^(p_.)*((d_.)*(x_))^(m_.), x_Symbol]
:> Simp[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^p)/(d*(m + 1)), x] - Dist[(b*c*p
)/(d*(m + 1)), Int[((d*x)^(m + 1)*(a + b*ArcTan[c*x])^(p - 1))/(1 + c^2*x^2
), x], x] /; FreeQ[{a, b, c, d, m}, x] && IGtQ[p, 0] && (EqQ[p, 1] || Integ
erQ[m]) && NeQ[m, -1]
```

Rule 4856

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))/((d_) + (e_.)*(x_)), x_Symbol] :> -S
imp[((a + b*ArcTan[c*x])*Log[2/(1 - I*c*x)])/e, x] + (Dist[(b*c)/e, Int[Log
[2/(1 - I*c*x)]/(1 + c^2*x^2), x], x] - Dist[(b*c)/e, Int[Log[(2*c*(d + e*x
))/((c*d + I*e)*(1 - I*c*x))]/(1 + c^2*x^2), x], x] + Simp[((a + b*ArcTan[c
*x])*Log[(2*c*(d + e*x))/((c*d + I*e)*(1 - I*c*x))])/e, x]) /; FreeQ[{a, b,
 c, d, e}, x] && NeQ[c^2*d^2 + e^2, 0]
```

Rule 4928

```
Int[(((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*(x_)^(m_.))/((d_) + (e_.)*(x_)^2),
x_Symbol] :> Int[ExpandIntegrand[a + b*ArcTan[c*x], x^m/(d + e*x^2), x], x]
 /; FreeQ[{a, b, c, d, e}, x] && IntegerQ[m] &&  !(EqQ[m, 1] && NeQ[a, 0])
```

Rule 5021

```
Int[((a_.) + ArcTan[(c_.)*(x_)]*(b_.))*((d_.) + Log[(f_.) + (g_.)*(x_)^2]*(
e_.))*(x_)^(m_.), x_Symbol] :> With[{u = IntHide[x^m*(a + b*ArcTan[c*x]), x
]}, Dist[d + e*Log[f + g*x^2], u, x] - Dist[2*e*g, Int[ExpandIntegrand[(x*u
)/(f + g*x^2), x], x], x]] /; FreeQ[{a, b, c, d, e, f, g}, x] && IntegerQ[m
] && NeQ[m, -1]
```

Rule 6725

```
Int[(u_)/((a_) + (b_.)*(x_)^(n_)), x_Symbol] :> With[{v = RationalFunctionE
xpand[u/(a + b*x^n), x]}, Int[v, x] /; SumQ[v]] /; FreeQ[{a, b}, x] && IGtQ
[n, 0]
```

Rubi steps

$$\int \frac{\left(a+b\tan^{-1}(cx)\right)\left(d+e\log\left(f+gx^2\right)\right)}{x^3}\,dx = -\frac{bc\left(d+e\log\left(f+gx^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\left(f+gx^2\right)\right.$$

$$= -\frac{bc\left(d+e\log\left(f+gx^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\left(f+gx^2\right)\right.$$

$$= -\frac{bc\left(d+e\log\left(f+gx^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\log\left(f+gx^2\right)\right.$$

$$= \frac{aeg\log(x)}{f} - \frac{bc\left(d+e\log\left(f+gx^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\right.$$

$$= \frac{aeg\log(x)}{f} - \frac{bc\left(d+e\log\left(f+gx^2\right)\right)}{2x} - \frac{1}{2}bc^2\tan^{-1}(cx)\left(d+e\right.$$

$$= \frac{bce\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} + \frac{aeg\log(x)}{f} - \frac{aeg\log\left(f+gx^2\right)}{2f} - \frac{bc\left(d\right.}{}$$

$$= \frac{bce\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} + \frac{aeg\log(x)}{f} - \frac{be\left(c^2f-g\right)\tan^{-1}(cx)\log}{f}$$

$$= \frac{bce\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} + \frac{aeg\log(x)}{f} - \frac{be\left(c^2f-g\right)\tan^{-1}(cx)\log}{f}$$

$$= \frac{bce\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)}{\sqrt{f}} + \frac{aeg\log(x)}{f} - \frac{be\left(c^2f-g\right)\tan^{-1}(cx)\log}{f}$$

Mathematica [B] time = 7.21, size = 1217, normalized size = 2.30

$$-\frac{2bc^2df\tan^{-1}(cx)x^2 - 4bce\sqrt{f}\sqrt{g}\tan^{-1}\left(\frac{\sqrt{g}x}{\sqrt{f}}\right)x^2 - 4ibc^2ef\sin^{-1}\left(\sqrt{\frac{c^2f}{c^2f-g}}\right)\tan^{-1}\left(\frac{cgx}{\sqrt{c^2fg}}\right)x^2 + 4ibeg\sin^{-1}\left(\right.}{}$$

Warning: Unable to verify antiderivative.

```
[In] Integrate[((a + b*ArcTan[c*x])*(d + e*Log[f + g*x^2]))/x^3,x]
```

```
[Out] -1/4*(2*a*d*f + 2*b*c*d*f*x + 2*b*d*f*ArcTan[c*x] + 2*b*c^2*d*f*x^2*ArcTan[
c*x] - 4*b*c*e*Sqrt[f]*Sqrt[g]*x^2*ArcTan[(Sqrt[g]*x)/Sqrt[f]] - (4*I)*b*c^
2*e*f*x^2*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*ArcTan[(c*g*x)/Sqrt[c^2*f*g]] +
 (4*I)*b*e*g*x^2*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*ArcTan[(c*g*x)/Sqrt[c^2*
f*g]] - 4*b*e*g*x^2*ArcTan[c*x]*Log[1 - E^((2*I)*ArcTan[c*x])] + 4*b*c^2*e*
f*x^2*ArcTan[c*x]*Log[1 + E^((2*I)*ArcTan[c*x])] - 2*b*c^2*e*f*x^2*ArcSin[S
qrt[(c^2*f)/(c^2*f - g)]]*Log[(c^2*(1 + E^((2*I)*ArcTan[c*x]))*f + (-1 + E^
((2*I)*ArcTan[c*x]))*g - 2*E^((2*I)*ArcTan[c*x])*Sqrt[c^2*f*g])/(c^2*f - g)
] + 2*b*e*g*x^2*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*Log[(c^2*(1 + E^((2*I)*Ar
cTan[c*x]))*f + (-1 + E^((2*I)*ArcTan[c*x]))*g - 2*E^((2*I)*ArcTan[c*x])*Sq
rt[c^2*f*g])/(c^2*f - g)] - 2*b*c^2*e*f*x^2*ArcTan[c*x]*Log[(c^2*(1 + E^((2
*I)*ArcTan[c*x]))*f + (-1 + E^((2*I)*ArcTan[c*x]))*g - 2*E^((2*I)*ArcTan[c*
x])*Sqrt[c^2*f*g])/(c^2*f - g)] + 2*b*e*g*x^2*ArcTan[c*x]*Log[(c^2*(1 + E^(
(2*I)*ArcTan[c*x]))*f + (-1 + E^((2*I)*ArcTan[c*x]))*g - 2*E^((2*I)*ArcTan[
c*x])*Sqrt[c^2*f*g])/(c^2*f - g)] + 2*b*c^2*e*f*x^2*ArcSin[Sqrt[(c^2*f)/(c^
```

```
2*f - g)]]*Log[1 + (E^((2*I)*ArcTan[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c
^2*f - g)] - 2*b*e*g*x^2*ArcSin[Sqrt[(c^2*f)/(c^2*f - g)]]*Log[1 + (E^((2*I
)*ArcTan[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g)] - 2*b*c^2*e*f*x^
2*ArcTan[c*x]*Log[1 + (E^((2*I)*ArcTan[c*x])*(c^2*f + g + 2*Sqrt[c^2*f*g]))
/(c^2*f - g)] + 2*b*e*g*x^2*ArcTan[c*x]*Log[1 + (E^((2*I)*ArcTan[c*x])*(c^2
*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g)] - 4*a*e*g*x^2*Log[x] + 2*a*e*f*Log[
f + g*x^2] + 2*b*c*e*f*x*Log[f + g*x^2] + 2*a*e*g*x^2*Log[f + g*x^2] + 2*b*
e*f*ArcTan[c*x]*Log[f + g*x^2] + 2*b*c^2*e*f*x^2*ArcTan[c*x]*Log[f + g*x^2]
 - (2*I)*b*c^2*e*f*x^2*PolyLog[2, -E^((2*I)*ArcTan[c*x])] + (2*I)*b*e*g*x^2
*PolyLog[2, E^((2*I)*ArcTan[c*x])] + I*b*c^2*e*f*x^2*PolyLog[2, (E^((2*I)*A
rcTan[c*x])*(-(c^2*f) - g + 2*Sqrt[c^2*f*g]))/(c^2*f - g)] - I*b*e*g*x^2*Po
lyLog[2, (E^((2*I)*ArcTan[c*x])*(-(c^2*f) - g + 2*Sqrt[c^2*f*g]))/(c^2*f -
g)] + I*b*c^2*e*f*x^2*PolyLog[2, -((E^((2*I)*ArcTan[c*x])*(c^2*f + g + 2*Sq
rt[c^2*f*g]))/(c^2*f - g))] - I*b*e*g*x^2*PolyLog[2, -((E^((2*I)*ArcTan[c*x
])*(c^2*f + g + 2*Sqrt[c^2*f*g]))/(c^2*f - g))])/(f*x^2)
```

fricas [F] time = 0.50, size = 0, normalized size = 0.00

$$\text{integral}\left(\frac{bd\arctan\left(cx\right)+ad+\left(be\arctan\left(cx\right)+ae\right)\log\left(gx^2+f\right)}{x^3},x\right)$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x^3,x, algorithm="fricas")
```

```
[Out] integral((b*d*arctan(c*x) + a*d + (b*e*arctan(c*x) + a*e)*log(g*x^2 + f))/x
^3, x)
```

giac [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x^3,x, algorithm="giac")
```

```
[Out] Timed out
```

maple [F] time = 10.36, size = 0, normalized size = 0.00

$$\int\frac{\left(a+b\arctan\left(cx\right)\right)\left(d+e\ln\left(g\,x^2+f\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x^3,x)
```

```
[Out] int((a+b*arctan(c*x))*(d+e*ln(g*x^2+f))/x^3,x)
```

maxima [F] time = 0.00, size = 0, normalized size = 0.00

$$-\frac{1}{2}\left(\left(c\arctan\left(cx\right)+\frac{1}{x}\right)c+\frac{\arctan\left(cx\right)}{x^2}\right)bd-\frac{1}{2}\left(g\left(\frac{\log\left(gx^2+f\right)}{f}-\frac{\log\left(x^2\right)}{f}\right)+\frac{\log\left(gx^2+f\right)}{x^2}\right)ae+\frac{\left(2\,cgx^2\arctan\right.}{}$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*arctan(c*x))*(d+e*log(g*x^2+f))/x^3,x, algorithm="maxima")
```

```
[Out] -1/2*((c*arctan(c*x) + 1/x)*c + arctan(c*x)/x^2)*b*d - 1/2*(g*(log(g*x^2 +
f)/f - log(x^2)/f) + log(g*x^2 + f)/x^2)*a*e + 1/2*(2*c*g*x^2*arctan(g*x/sq
rt(f*g)) + (4*c^2*g*x^2*integrate(1/2*x*arctan(c*x)/(g*x^2 + f), x) + 4*g*x
```

```
^2*integrate(1/2*arctan(c*x)/(g*x^3 + f*x), x) - (c*x + (c^2*x^2 + 1)*arcta
n(c*x))*log(g*x^2 + f))*sqrt(f*g))*b*e/(sqrt(f*g)*x^2) - 1/2*a*d/x^2
```

mupad [F] time = 0.00, size = -1, normalized size = -0.00

$$\int \frac{(a + b\,\mathrm{atan}\,(c\,x))\,\left(d + e\,\ln\left(g\,x^2 + f\right)\right)}{x^3}\,dx$$

Verification of antiderivative is not currently implemented for this CAS.

```
[In] int(((a + b*atan(c*x))*(d + e*log(f + g*x^2)))/x^3,x)
[Out] int(((a + b*atan(c*x))*(d + e*log(f + g*x^2)))/x^3, x)
```

sympy [F(-1)] time = 0.00, size = 0, normalized size = 0.00

Timed out

Verification of antiderivative is not currently implemented for this CAS.

```
[In] integrate((a+b*atan(c*x))*(d+e*ln(g*x**2+f))/x**3,x)
[Out] Timed out
```

Chapter 4

Listing of Grading functions

The following are the current version of the grading functions used for grading the quality of the antiderivative with reference to the optimal antiderivative included in the test suite.

There is a version for Maple and for Mathematica/Rubi. There is a version for grading Sympy and version for use with Sagemath.

The following are links to the current source code.

The following are the listings of source code of the grading functions.

4.0.1 Mathematica and Rubi grading function

```
(* Original version thanks to Albert Rich emailed on 03/21/2017 *)
(* ::Package:: *)

(* ::Subsection:: *)
(*GradeAntiderivative[result,optimal]*)


(* ::Text:: *)
(*If result and optimal are mathematical expressions, *)
(*         GradeAntiderivative[result,optimal] returns*)
(*  "F" if the result fails to integrate an expression that*)
(*      is integrable*)
(*  "C" if result involves higher level functions than necessary*)
(*  "B" if result is more than twice the size of the optimal*)
(*      antiderivative*)
(*  "A" if result can be considered optimal*)


GradeAntiderivative[result_,optimal_] :=
  If[ExpnType[result]<=ExpnType[optimal],
    If[FreeQ[result,Complex] || Not[FreeQ[optimal,Complex]],
      If[LeafCount[result]<=2*LeafCount[optimal],
        "A",
      "B"],
    "C"],
  If[FreeQ[result,Integrate] && FreeQ[result,Int],
    "C",
  "F"]]


(* ::Text:: *)
(*The following summarizes the type number assigned an *)
(*expression based on the functions it involves*)
(*1 = rational function*)
(*2 = algebraic function*)
```

```
(*3 = elementary function*)
(*4 = special function*)
(*5 = hyperpergeometric function*)
(*6 = appell function*)
(*7 = rootsum function*)
(*8 = integrate function*)
(*9 = unknown function*)


ExpnType[expn_] :=
  If[AtomQ[expn],
    1,
  If[ListQ[expn],
    Max[Map[ExpnType,expn]],
  If[Head[expn]===Power,
    If[IntegerQ[expn[[2]]],
      ExpnType[expn[[1]]],
    If[Head[expn[[2]]]===Rational,
      If[IntegerQ[expn[[1]]] || Head[expn[[1]]]===Rational,
        1,
      Max[ExpnType[expn[[1]]],2]],
    Max[ExpnType[expn[[1]]],ExpnType[expn[[2]]],3]]],
  If[Head[expn]===Plus || Head[expn]===Times,
    Max[ExpnType[First[expn]],ExpnType[Rest[expn]]],
  If[ElementaryFunctionQ[Head[expn]],
    Max[3,ExpnType[expn[[1]]]],
  If[SpecialFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],4]],
  If[HypergeometricFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],5]],
  If[AppellFunctionQ[Head[expn]],
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],6]],
  If[Head[expn]===RootSum,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],7]],
  If[Head[expn]===Integrate || Head[expn]===Int,
    Apply[Max,Append[Map[ExpnType,Apply[List,expn]],8]],
  9]]]]]]]]]]


ElementaryFunctionQ[func_] :=
  MemberQ[{
        Exp,Log,
        Sin,Cos,Tan,Cot,Sec,Csc,
        ArcSin,ArcCos,ArcTan,ArcCot,ArcSec,ArcCsc,
        Sinh,Cosh,Tanh,Coth,Sech,Csch,
        ArcSinh,ArcCosh,ArcTanh,ArcCoth,ArcSech,ArcCsch
},func]


SpecialFunctionQ[func_] :=
  MemberQ[{
        Erf, Erfc, Erfi,
        FresnelS, FresnelC,
        ExpIntegralE, ExpIntegralEi, LogIntegral,
        SinIntegral, CosIntegral, SinhIntegral, CoshIntegral,
        Gamma, LogGamma, PolyGamma,
        Zeta, PolyLog, ProductLog,
        EllipticF, EllipticE, EllipticPi
},func]


HypergeometricFunctionQ[func_] :=
  MemberQ[{Hypergeometric1F1,Hypergeometric2F1,HypergeometricPFQ},func]
```

```
AppellFunctionQ[func_] :=
  MemberQ[{AppellF1},func]
```

4.0.2 Maple grading function

```
# File: GradeAntiderivative.mpl
# Original version thanks to Albert Rich emailed on 03/21/2017

#Nasser 03/22/2017  Use Maple leaf count instead since buildin
#Nasser 03/23/2017  missing 'ln' for ElementaryFunctionQ added
#Nasser 03/24/2017  corrected the check for complex result
#Nasser 10/27/2017  check for leafsize and do not call ExpnType()
#                   if leaf size is "too large". Set at 500,000
#Nasser 12/22/2019  Added debug flag, added 'dilog' to special functions
#                   see problem 156, file Apostol_Problems

GradeAntiderivative := proc(result,optimal)
local leaf_count_result, leaf_count_optimal,ExpnType_result,ExpnType_optimal,
   debug:=false;

      leaf_count_result:=leafcount(result);
      #do NOT call ExpnType() if leaf size is too large. Recursion problem
      if leaf_count_result > 500000 then
          return "B";
      fi;

      leaf_count_optimal:=leafcount(optimal);

      ExpnType_result:=ExpnType(result);
      ExpnType_optimal:=ExpnType(optimal);

      if debug then
         print("ExpnType_result",ExpnType_result," ExpnType_optimal=",
   ExpnType_optimal);
      fi;

# If result and optimal are mathematical expressions,
#  GradeAntiderivative[result,optimal] returns
#   "F" if the result fails to integrate an expression that
#       is integrable
#   "C" if result involves higher level functions than necessary
#   "B" if result is more than twice the size of the optimal
#       antiderivative
#   "A" if result can be considered optimal

  #This check below actually is not needed, since I only
  #call this grading only for passed integrals. i.e. I check
  #for "F" before calling this. But no harm of keeping it here.
  #just in case.


  if not type(result,freeof('int')) then
     return "F";
  end if;


  if ExpnType_result<=ExpnType_optimal then
      if debug then
           print("ExpnType_result<=ExpnType_optimal");
      fi;
```

```
      if is_contains_complex(result) then
         if is_contains_complex(optimal) then
            if debug then
               print("both result and optimal complex");
            fi;
            #both result and optimal complex
            if leaf_count_result<=2*leaf_count_optimal then
               return "A";
            else
               return "B";
            end if
         else #result contains complex but optimal is not
            if debug then
               print("result contains complex but optimal is not");
            fi;
            return "C";
         end if
      else # result do not contain complex
           # this assumes optimal do not as well
           if debug then
               print("result do not contain complex, this assumes optimal do
   not as well");
           fi;
           if leaf_count_result<=2*leaf_count_optimal then
              if debug then
                 print("leaf_count_result<=2*leaf_count_optimal");
              fi;
              return "A";
           else
              if debug then
                 print("leaf_count_result>2*leaf_count_optimal");
              fi;
              return "B";
           end if
      end if
  else #ExpnType(result) > ExpnType(optimal)
      if debug then
         print("ExpnType(result) > ExpnType(optimal)");
      fi;
      return "C";
  end if

end proc:

#
# is_contains_complex(result)
# takes expressions and returns true if it contains "I" else false
#
#Nasser 032417
is_contains_complex:= proc(expression)
  return (has(expression,I));
end proc:

# The following summarizes the type number assigned an expression
# based on the functions it involves
# 1 = rational function
# 2 = algebraic function
# 3 = elementary function
# 4 = special function
# 5 = hyperpergeometric function
# 6 = appell function
# 7 = rootsum function
# 8 = integrate function
```

```
# 9 = unknown function

ExpnType := proc(expn)
  if type(expn,'atomic') then
    1
  elif type(expn,'list') then
    apply(max,map(ExpnType,expn))
  elif type(expn,'sqrt') then
    if type(op(1,expn),'rational') then
       1
    else
       max(2,ExpnType(op(1,expn)))
    end if
  elif type(expn,'`^`') then
    if type(op(2,expn),'integer') then
      ExpnType(op(1,expn))
    elif type(op(2,expn),'rational') then
      if type(op(1,expn),'rational') then
         1
      else
         max(2,ExpnType(op(1,expn)))
      end if
    else
         max(3,ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    end if
  elif type(expn,'`+`') or type(expn,'`*`') then
    max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
  elif ElementaryFunctionQ(op(0,expn)) then
    max(3,ExpnType(op(1,expn)))
  elif SpecialFunctionQ(op(0,expn)) then
    max(4,apply(max,map(ExpnType,[op(expn)])))
  elif HypergeometricFunctionQ(op(0,expn)) then
    max(5,apply(max,map(ExpnType,[op(expn)])))
  elif AppellFunctionQ(op(0,expn)) then
    max(6,apply(max,map(ExpnType,[op(expn)])))
  elif op(0,expn)='int' then
    max(8,apply(max,map(ExpnType,[op(expn)]))) else
  9
  end if
end proc:


ElementaryFunctionQ := proc(func)
  member(func,[
        exp,log,ln,
        sin,cos,tan,cot,sec,csc,
        arcsin,arccos,arctan,arccot,arcsec,arccsc,
        sinh,cosh,tanh,coth,sech,csch,
        arcsinh,arccosh,arctanh,arccoth,arcsech,arccsch])
end proc:

SpecialFunctionQ := proc(func)
  member(func,[
        erf,erfc,erfi,
        FresnelS,FresnelC,
        Ei,Ei,Li,Si,Ci,Shi,Chi,
        GAMMA,lnGAMMA,Psi,Zeta,polylog,dilog,LambertW,
        EllipticF,EllipticE,EllipticPi])
end proc:

HypergeometricFunctionQ := proc(func)
  member(func,[Hypergeometric1F1,hypergeom,HypergeometricPFQ])
end proc:
```

```
AppellFunctionQ := proc(func)
  member(func,[AppellF1])
end proc:

# u is a sum or product.  rest(u) returns all but the
# first term or factor of u.
rest := proc(u) local v;
  if nops(u)=2 then
     op(2,u)
  else
     apply(op(0,u),op(2..nops(u),u))
  end if
end proc:

#leafcount(u) returns the number of nodes in u.
#Nasser 3/23/17  Replaced by build-in leafCount from package in Maple
leafcount := proc(u)
   MmaTranslator[Mma][LeafCount](u);
end proc:
```

4.0.3 Sympy grading function

```
#Dec 24, 2019. Nasser M. Abbasi:
#              Port of original Maple grading function by
#              Albert Rich to use with Sympy/Python
#Dec 27, 2019  Nasser. Added `RootSum`. See problem 177, Timofeev file
#              added 'exp_polar'
from sympy import *

def leaf_count(expr):
    #sympy do not have leaf count function. This is approximation
    return round(1.7*count_ops(expr))

def is_sqrt(expr):
    if isinstance(expr,Pow):
        if expr.args[1] == Rational(1,2):
            return True
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    return func in [exp,log,ln,sin,cos,tan,cot,sec,csc,
            asin,acos,atan,acot,asec,acsc,sinh,cosh,tanh,coth,sech,csch,
            asinh,acosh,atanh,acoth,asech,acsch
        ]

def is_special_function(func):
    return func in [ erf,erfc,erfi,
             fresnels,fresnelc,Ei,Ei,Li,Si,Ci,Shi,Chi,
             gamma,loggamma,digamma,zeta,polylog,LambertW,
             elliptic_f,elliptic_e,elliptic_pi,exp_polar
         ]

def is_hypergeometric_function(func):
    return func in [hyper]

def is_appell_function(func):
    return func in [appellf1]
```

```
def is_atom(expn):
    try:
        if expn.isAtom or isinstance(expn,int) or isinstance(expn,float):
           return True
        else:
           return False

    except AttributeError as error:
        return False

def expnType(expn):
    debug=False
    if debug:
        print("expn=",expn,"type(expn)=",type(expn))

    if is_atom(expn):
      return 1
    elif isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
            return 1
        else:
            return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn)))
    elif isinstance(expn,Pow):   #type(expn,'`^`')
        if isinstance(expn.args[1],Integer):  #type(op(2,expn),'integer')
            return expnType(expn.args[0])   #ExpnType(op(1,expn))
        elif isinstance(expn.args[1],Rational):  #type(op(2,expn),'rational')
            if isinstance(expn.args[0],Rational): #type(op(1,expn),'rational')
                return 1
            else:
                return max(2,expnType(expn.args[0]))  #max(2,ExpnType(op(1,expn
   )))
        else:
            return max(3,expnType(expn.args[0]),expnType(expn.args[1])) #max(3,
   ExpnType(op(1,expn)),ExpnType(op(2,expn)))
    elif isinstance(expn,Add) or isinstance(expn,Mul): #type(expn,'`+`') or
   type(expn,'`*`')
        m1 = expnType(expn.args[0])
        m2 = expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.func):  #ElementaryFunctionQ(op(0,expn))
        return max(3,expnType(expn.args[0]))  #max(3,ExpnType(op(1,expn)))
    elif is_special_function(expn.func): #SpecialFunctionQ(op(0,expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(4,m1)   #max(4,apply(max,map(ExpnType,[op(expn)])))
    elif is_hypergeometric_function(expn.func): #HypergeometricFunctionQ(op(0,
   expn))
        m1 = max(map(expnType, list(expn.args)))
        return max(5,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif is_appell_function(expn.func):
        m1 = max(map(expnType, list(expn.args)))
        return max(6,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    elif isinstance(expn,RootSum):
        m1 = max(map(expnType, list(expn.args))) #Apply[Max,Append[Map[ExpnType
   ,Apply[List,expn]],7]],
        return max(7,m1)
    elif str(expn).find("Integral") != -1:
        m1 = max(map(expnType, list(expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9
```

```
#main function
def grade_antiderivative(result,optimal):

    leaf_count_result  = leaf_count(result)
    leaf_count_optimal = leaf_count(optimal)

    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if str(result).find("Integral") != -1:
        return "F"

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
   well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```

4.0.4 SageMath grading function

```
#Dec 24, 2019. Nasser: Ported original Maple grading function by
#              Albert Rich to use with Sagemath. This is used to
#              grade Fricas, Giac and Maxima results.
#Dec 24, 2019. Nasser: Added 'exp_integral_e' and 'sng', 'sin_integral'
#              'arctan2','floor','abs','log_integral'

from sage.all import *
from sage.symbolic.operators import add_vararg, mul_vararg

debug=False;

def tree_size(expr):
    r"""
    Return the tree size of this expression.
    """
    if expr not in SR:
        # deal with lists, tuples, vectors
        return 1 + sum(tree_size(a) for a in expr)
    expr = SR(expr)
    x, aa = expr.operator(), expr.operands()
    if x is None:
        return 1
    else:
        return 1 + sum(tree_size(a) for a in aa)

def is_sqrt(expr):
    if expr.operator() == operator.pow:   #isinstance(expr,Pow):
        if expr.operands()[1]==1/2: #expr.args[1] == Rational(1,2):
            if debug: print ("expr is sqrt")
            return True
```

```
        else:
            return False
    else:
        return False

def is_elementary_function(func):
    debug=False
    m = func.name() in ['exp','log','ln',
            'sin','cos','tan','cot','sec','csc',
            'arcsin','arccos','arctan','arccot','arcsec','arccsc',
            'sinh','cosh','tanh','coth','sech','csch',
            'arcsinh','arccosh','arctanh','arccoth','arcsech','arccsch','sgn',
        'arctan2','floor','abs'
        ]
    if debug:
        if m:
            print ("func ", func , " is elementary_function")
        else:
            print ("func ", func , " is NOT elementary_function")


    return m

def is_special_function(func):
    debug=False
    if debug: print ("type(func)=", type(func))

    m= func.name() in ['erf','erfc','erfi','fresnel_sin','fresnel_cos','Ei',
           'Ei','Li','Si','sin_integral','Ci','cos_integral','Shi','
    sinh_integral'
           'Chi','cosh_integral','gamma','log_gamma','psi,zeta',
           'polylog','lambert_w','elliptic_f','elliptic_e',
           'elliptic_pi','exp_integral_e','log_integral']

    if debug:
        print ("m=",m)
        if m:
            print ("func ", func ," is special_function")
        else:
            print ("func ", func ," is NOT special_function")


    return m


def is_hypergeometric_function(func):
    return func.name() in ['hypergeometric','hypergeometric_M','
    hypergeometric_U']

def is_appell_function(func):
    return func.name() in ['hypergeometric']   #[appellf1] can't find this in
    sagemath

def is_atom(expn):

    debug=False
    if debug: print ("Enter is_atom")


    #thanks to answer at https://ask.sagemath.org/question/49179/what-is-
    sagemath-equivalent-to-atomic-type-in-maple/
    try:
        if expn.parent() is SR:
```

```
            return expn.operator() is None
        if expn.parent() in (ZZ, QQ, AA, QQbar):
            return expn in expn.parent() # Should always return True
        if hasattr(expn.parent(),"base_ring") and hasattr(expn.parent(),"gens")
    :
            return expn in expn.parent().base_ring() or expn in expn.parent().
    gens()
        return False

    except AttributeError as error:
        return False


def expnType(expn):

    if debug:
        print (">>>>>Enter expnType, expn=", expn)
        print (">>>>>is_atom(expn)=", is_atom(expn))

    if is_atom(expn):
        return 1
    elif type(expn)==list:   #isinstance(expn,list):
        return max(map(expnType, expn))   #apply(max,map(ExpnType,expn))
    elif  is_sqrt(expn):
        if  type(expn.operands()[0])==Rational: #type(isinstance(expn.args[0],
    Rational):
            return 1
        else:
            return max(2,expnType(expn.operands()[0]))  #max(2,expnType(expn.
    args[0]))
    elif expn.operator() == operator.pow:   #isinstance(expn,Pow)
        if type(expn.operands()[1])==Integer:  #isinstance(expn.args[1],Integer
    )
            return expnType(expn.operands()[0])   #expnType(expn.args[0])
        elif type(expn.operands()[1])==Rational:  #isinstance(expn.args[1],
    Rational)
            if type(expn.operands()[0])==Rational: #isinstance(expn.args[0],
    Rational)
                return 1
            else:
                return max(2,expnType(expn.operands()[0]))  #max(2,expnType(
    expn.args[0]))
        else:
            return max(3,expnType(expn.operands()[0]),expnType(expn.operands()
    [1])) #max(3,expnType(expn.operands()[0]),expnType(expn.operands()[1]))
    elif expn.operator() == add_vararg or expn.operator() == mul_vararg: #
    isinstance(expn,Add) or isinstance(expn,Mul)
        m1 = expnType(expn.operands()[0]) #expnType(expn.args[0])
        m2 = expnType(expn.operands()[1:]) #expnType(list(expn.args[1:]))
        return max(m1,m2)  #max(ExpnType(op(1,expn)),max(ExpnType(rest(expn))))
    elif is_elementary_function(expn.operator()):  #is_elementary_function(expn
    .func)
        return max(3,expnType(expn.operands()[0]))
    elif is_special_function(expn.operator()): #is_special_function(expn.func)
        m1 = max(map(expnType, expn.operands()))      #max(map(expnType, list(
    expn.args)))
        return max(4,m1)   #max(4,m1)
    elif is_hypergeometric_function(expn.operator()): #
    is_hypergeometric_function(expn.func)
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(5,m1)   #max(5,m1)
    elif is_appell_function(expn.operator()):
```

```
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(6,m1)   #max(6,m1)
    elif str(expn).find("Integral") != -1: #this will never happen, since it
                #is checked before calling the grading function that is passed.
                #but kept it here.
        m1 = max(map(expnType, expn.operands()))       #max(map(expnType, list(
    expn.args)))
        return max(8,m1)   #max(5,apply(max,map(ExpnType,[op(expn)])))
    else:
        return 9

#main function
def grade_antiderivative(result,optimal):

    if debug: print ("Enter grade_antiderivative for sagemath")

    leaf_count_result  = tree_size(result) #leaf_count(result)
    leaf_count_optimal = tree_size(optimal) #leaf_count(optimal)

    if debug: print ("leaf_count_result=", leaf_count_result, "
    leaf_count_optimal=",leaf_count_optimal)


    expnType_result  = expnType(result)
    expnType_optimal = expnType(optimal)

    if debug: print ("expnType_result=", expnType_result, "expnType_optimal=",
    expnType_optimal)

    if expnType_result <= expnType_optimal:
        if result.has(I):
            if optimal.has(I): #both result and optimal complex
                if leaf_count_result <= 2*leaf_count_optimal:
                    return "A"
                else:
                    return "B"
            else: #result contains complex but optimal is not
                return "C"
        else: # result do not contain complex, this assumes optimal do not as
    well
            if leaf_count_result <= 2*leaf_count_optimal:
                return "A"
            else:
                return "B"
    else:
        return "C"
```